The Interrelationship amongst Depression, Loneliness, Self-Regulation, and Academic Achievement in Canadian and International Students

by

Mehrdad Shahidi

A thesis submitted to the

Nova Scotia Inter-University Doctoral Administrative Committee and MSVU in partial fulfilment for the degree of

Doctor of Philosophy in Educational Studies

Halifax, Nova Scotia

Abstract

Background: The number of international students in Western universities was estimated to be 7.2 million (CBIE, 2017, 2018) or 8 million in 2025 (Quacquarelli Symonds, 2020). In Canada, this number was 642,480 on December 31, 2019 indicating a 13% increase over 2018 (CBIE, 2020a). This unique historical trend in most Western higher educational systems has engaged researchers' attention locally and globally. Although, few studies were recently focused on the different economical, educational, and psychological aspects of international students in Canada (Smith, 2016; Sondhi, 2014) or in the other Western countries (Migration Advisory Committee, 2019; Muller & Daller, 2019; Poyrazli, 2015), the literature review revealed that there are several disparities or gaps among those studies that have particularly focused on depression, loneliness, self-regulation, and academic achievement in international and local students in Western countries.

Some of these gaps include the lack of replication, ignoring the direct and mediating roles of the above-noted factors in academic achievement, and the lack of comparative studies to explore differences/similarities in International and Canadian students. Also, previous studies were not focused on the interrelationships between and the predictive roles of depression, loneliness, and cognitive regulation in educational performance. Moreover, they had scant attention to the impact of university influencers, involvement, and social connectedness on academic function in relation to above-noted psychological factors.

Purpose of Study: To reduce some of these disparities among the literature, the research questions revolved around the predictability of academic achievement through university influencers, academic involvement, social connectedness, depression, loneliness, and self-

regulation. In addition to exploring path models to explain academic achievement, the differences and similarities between International and Canadian samples were examined.

Method: Based on statistical methods (Meyers, Gamst, & Guarino, 2006; Krejcie & Morgan, 1970), 427 Canadian and International students aged 19 to 37 years old attending MSVU participated in this study and completed five questionnaires/scales. These questionnaires include the Research (Demographic) Questionnaire, Kutcher Adolescent Depression Scale - 11, R-UCLA Loneliness Scale, Cognitive Emotion Regulation Questionnaire (CERQ), and Academic Self-Report Questionnaire. Multiple regression, ANOVA, MANOVA, path analysis, and some other parametric and non-parametric statistical procedures were used to answer the research questions.

Results: The research revealed several findings such as higher levels of loneliness, adaptive self-regulation, connectedness to faculty, and involvement in social activities in International samples. As well, lower levels of academic achievement in International samples and some other differences were found. Loneliness, depression, social connectedness, and university involvement could predict between 20% and 28% of variability of academic achievement in both groups of samples. Path analysis showed an appropriate model to explain depression as a significant mediating factor in academic achievement. **Implication:** Several recommendations and implications for mental health practitioners, educators, educational policy makers, and future researchers were discussed.

Dedication

To all Canadian and international students.

Acknowledgement

I would like to thank some of those who have provided support to me throughout this academic journey. First of all, much appreciation to my supervisor, mentor, and friend, Dr. Frederick French, whose support, ability, patience, and knowledge have helped me to direct my learning through these years of study.

Sincerely thanks to my committee members: Dr. Stan Kutcher and Dr. Jim Sharpe. Apart from their input, advice, and feedback, they have shown me how to act as both an academic and a caring citizen. I am grateful to my distinguished professor and former committee member, Dr. Carmel French. She has provided me with lots of great academic and friendly advice during these years of study.

Also, I would like to have special thanks to Dr. Xiaobin Li, my External Examiner, for his time and contribution to this work. It was my pleasure to learn from his advice. I must also thank Dr. Kim Kienapple for his great advice and support. And also, I must thank so much Dr. Mary Jane Harkins who was the chair of defense committee and devoted her time to coordinate the defense session perfectly.

Most important to me has been the support of my family, Nazy and Sana, thank you for providing me the time and support to traverse and immerse myself in the land of academia.

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Chapter I: Introduction

The increasing usage of the terms overseas student, foreign student, cross-border student, and international student in the psycho-educational literature (Abdullah, Abd Aziz, & Ibrahim, 2014; McGill, 2013; Muller & Daller, 2019; Nguyen, 2013; Saravanan, Mohamad, & Alias, 2019) displays an unprecedented historical trend in most Western higher educational systems. Generally, this trend revolves around those students who have chosen to travel to another country to pursue their academic studies (Liu, 2009). Distinguished from native or domestic students, this specific group of students has been described as sojourners who are part of a global trend (Wang & Mallinckrodt, 2006).

Sometimes this is described as a *'rise of the East*' in Western countries. This trend is producing many unpredicted psycho-social difficulties that have not only involved educational policy makers, but also has engaged mental health professionals and care systems across those countries (Abdullah et al., 2014; McGill, 2013). This discernible trend seems to be continuing when the increasing number of non-domestic students in those countries, particularly North America, becomes a center point of attention.

Laughlin (2014) reported that more than 4 million students are studying in colleges and universities outside of their countries of origin. Furthermore, it was estimated that global demand for international higher education is supposed to increase from 4.1 million in 2010 to 7.2 million in 2025 (Canadian Bureau of International Education - CBIE/BCEI, 2017). Based on Statistics Canada (2016), in just one Canadian province, New Brunswick, the percentage of international students who enrolled in both colleges and universities increased from 3% in 1992 to 11.4% in 2008. When the other provinces are considered, this trend showed a smooth increasing level up

to 11% for the whole of Canada in 2014/2015 (Statistics Canada, 2016, 2017). There were 572,415 international students in Canada in 2018 (CBIE, 2020b). The recent estimation indicates that the number of international students in Canada from 2010 to 2017 increased up to 119% (CBIE, 2018). CBIE in 2020 revealed that "of December 31, 2019 there were 642,480 international students in Canada. This number represents a 13% increase over 2018, a slightly slower rate of growth than in 2018 when international student numbers grew by 16% over the previous year" (CBIE, 2020a, p.1). The number of international students in Canada is going to be increased in next few years since the Global Affairs Canada (2019) emphasized a strategy to draw students around the world from 2019 to 2024.

International students have come to Canada from different countries of which five countries, China, India, South Korea, France, and Vietnam, were the top sending places in 2018 (CBIE, 2018). Except for Vietnam that was ranked in the top five in 2018, the first four countries have remained in the top five from 2014 to 2017 (CBIE, 2018). Likewise, 49.1% of international students in America came from China, South Korea, and India in 2013 (Bista, 2015). However, Canada is in the top four countries towards which international students' tendencies are directed for continuing higher education (CBIE/BCEI, 2017; CBIE, 2018). All Canadian higher academic institutions may be targeted by international students, but colleges and universities in Ontario, Quebec, British Columbia, Nova Scotia, and Alberta are the most interesting academic institutions for international students (Statistics Canada, 2015). For example, of 55,200 postsecondary enrolments (79% for universities and 21% for colleges) in Nova Scotia (NS) for the 2014 and 2015 academic year, between 9 and 10% were devoted to international students' enrolments (Statistics Canada, 2016). Generally, of the international students in Canada, approximately 3% were in Nova Scotia in 2017 (CBIE, 2018). It was recently reported that there

are over 9,000 international students enrolled in Nova Scotia's universities and colleges in 2020 (Nova Scotia International Student Program, 2020)

Indeed, Mount Saint Vincent University (MSVU) in NS where this thesis research was conducted, has an enrollment of 3,757 enrolments in fall of 2018. Of this number, 531 students (14%) self-identified an international student (Office of Institutional Analysis-MSVU, 2018). Most of this percentage refers to international students whose ages were between 18 and 28 years. This range of age is similar to Canadian and Landed Immigrant students in MSVU (Statistics Canada, 2017). Generally, these statistics show an increasing tendency among international students for pursuing their studies in Canadian universities or colleges.

The reasons for this inflated tendency lie in low tuition fees, high quality of education, less educational discrimination, and universal ranking of Canadian universities (CBIE, 2018; Laughlin, 2014). However, the personal reasons may vary in terms of students' nationality or culture and personal propensities (Abdullah et al., 2014). Most personal tendencies revolve around gaining knowledge and skills, having independent life experiences, career, and increasing self-confidence (Sherry, Thomas, & Chui, 2010). Using structural equation modeling, Zhang, Sun, and Hagedorn (2013) conducted a study of Chinese students and found that the students' satisfaction with the campus experience and English proficiency were direct predictors of their intentions to study overseas. These authors also demonstrated that some other factors including parents' education, level of institutional support, and the quality of campus relationship have indirect influences on students' tendencies to pursue higher academic education in other countries.

Despite international students' personal or social motives for choosing Canada or other countries for their academic destinations, this group of students gained several educational, economic, and psycho-social experiences after starting their studies in such countries (Abdullah et al., 2014; Brunsting, Zachry, & Takeuchi, 2018; Kim & Young AnRa, 2015; Liao, Ferdenzi, & Edlin, 2012; Liu, 2009; Varvisotis, Matyo-Cepero, & Tracy, 2020). These experiences are both positive and negative. Montgomery (2010), in her book named *Understanding the International Student Experience*, explored several positive consequences that international students may experience in host countries. She described that international students live beside domestic students through which they become able to establish a trustworthy meaning of their academic performance or learning from their own perspectives of being embedded in a new social relationship. The result of this type of relationship, which is called a *symbiotic experience*, is not always the rise of East or East versus West; it may be a type of East beside West.

Such benign experiences were interpreted in terms of international students' culture, nationality, and motivation (Liao et al., 2012; McWhirter, Torres, Salgado, & Valdez, 2007; Yang, Zhang, & Sheldon, 2018). For example, Yang et al. (2018) argued that international students' motivation can influence their acculturation in new context positively to fulfill their needs. Also, Laughlin (2014) demonstrated that in addition to positive experiences, American students in Canadian universities showed relatively appropriate cultural transition. Nevertheless, there are some challenges that international students have faced in different educational systems. In a review of 497 journal articles, which were focused on international students' experiences and published between 1980 and 2013, Abdullah et al. (2014) demonstrated that such students have faced different psychological and academic challenges personally and contextually with academic system.

Recently, Varvisotis et al. (2020) argued that one of the challenges for international students is to learn second language that can affect their academic achievement negatively. Also, Brunsting, Zachry and Takeuchi (2018) conducted a systematic literature review on 30 academic articles from 2009 to 2017 and revealed that acculturative stress, psychological adjustment, social belonging, depression, and anxiety were some of the common psycho-educational challenges in international students in the United States. These types of challenges were reported by other researchers previously (Akanwa, 2015).

In the line of above noted challenges, some other difficulties were demonstrated as well. Difficulty in achieving proper academic goals, problems in acclimatizing to new situations or maladjustment (Qi, Wang, Pincus, & Wu, 2018; Zhang & Goodson, 2011), cultural and language challenges (McKinley, 2019), psychological problems such as depression and anxiety (Brunsting et al., 2018; Hamaideh, Hamdan-Mansour, 2014; Poyrazli, 2015), social-interactional problems such as loneliness (Bek, 2017; Blazina, Settle, & Eddins, 2008; Diehl, Jansen, Ishchanova, & Hilger-Kolb, 2018; Quan, Zhen, Yao, & Zhou, 2014; Shahidi, 2013), cognitive-behavioral problems (Kim et al., 2015), and educational problems such as low level of academic achievement (Glass, Braskamp, & Buus, 2013;Talebloo & Bin Baki, 2013; Varvisotis et al., 2020) are the most cited negative consequences or challenges that international students experienced in host countries.

The literature review showed that there are some differences in the previous related research. In a study on 310 college students (85% domestic students and 15% international students), Liao et al. (2012) demonstrated that international students have better academic achievement than domestic students. Likewise, McWhirter et al. (2007) demonstrated the same result for high school and post-secondary international students when their academic

achievements were compared to domestic students. Likewise, as a part of World Mental Health Surveys International College Student Project, Bruffaerts et al. (2018) examined 12-month mental health problems in 4,921 KU Leuven University students in Belgium and revealed that local students faced different psycho-social problems such as internalizing problems (23.7%), externalizing problems (18.3%), substance use (5.4%), and antisocial problems (0.1%).

More specifically, some researchers studied different single or a group of factors to find the major predictors and correlates of academic achievement either in international students individually or comparably in both domestic and international students (Iglesia, Hoffmann, & Liporace, 2014; Kim et al., 2015; Poyrazli, 2015; Turashvili & Japaridze, 2012; Yang et al., 2018). Further to the different predictors of academic achievement, posttraumatic stress disorder (Boyraz et al., 2013; Malinauskiene, & Malinauskas, 2018), parental relationship such as the level of responsiveness or demandingness (Iglesia et al., 2014), goal orientation and peer support (Kim et al., 2015), and other psychological factors such as depression or anxiety (Brunsting et al., 2018; Hamaideh et al., 2014) were cited as very influential factors in students' academic achievement that were studied individually.

Although these influential factors were studied separately in international students such as Argentinean college students (Iglesia et al., 2014), Korean and Asian students (Bista, 2015; Kim et al., 2015), Chinese students (Yang et al., 2018), or African American students (Boyraz et al., 2013), several studies revealed that some of these factors can create significant different academic achievement in other groups of students (e.g., depressed students). For example, Mousa, Dhamoon, Lander, and Dhamoon, (2016) examined the effects of depressive symptoms and anxiety on academic achievement in 126 residents/fellows and 336 medical students. They reported that 33.3% of postgraduates and 32% of medical students believed there was a

significant impact of depression or anxiety on their academic performance. Likewise, Turashvili and Japaridze, (2012) demonstrated that regardless of students' nationality, those with a low level of psychological well-being and with depressive symptoms showed poor academic performance. Similar results were found by Hysenbegasi et al. (2005) and by Al-Qaisy (2011) for the factor of depression (depressive symptoms).

An examination of such studies revealed that they have different limitations theoretically or methodologically. For example, believing that the dropout from four-year academic institutions mostly happens in the first year of college or university caused researchers to focus on students' academic achievement only during the first year of study while ignoring the process of academic improvement or adjustment (Boyraz et al., 2013). Although the dropout from four-year academic institutions partially happens in the first year of college or university (Gurney, 2015; Paton, 2014; Tinto, 1993), academic achievement is developmentally based on the patterns of students' academic adjustment or improving from the first year to the year of graduation (Mustaffa & Ilias, 2013).

Additionally, lack of a systemic view in such studies is another kind of such limitation. For example, DeFreitas and Rinn, (2013) studied the impact of verbal and math self-concept on academic performance without considering that verbal self-concept is closely associated to language proficiency through hierarchical processes. Over the first year, international students whose first language is other than English or French are usually learning and practicing their second language that may affect not only their adjustment or mental health but also their learning performance (Martirosyan, Hwang, & Wanjohi, 2015). Also, the lack of enough attention to the wide range of mental health related factors and environmental influences in academic achievement may limit the external reliability of such studies. Particularly, these factors may act

as latent factors to form academic achievement differently (Iglesia et al., 2014). In this regard, some researchers indicated that students' precollege or pre-university characteristics may have latent effects on their academic performance contextually (Boyraz et al., 2013; Dzulkifl et al., 2012).

A review of such influences on academic achievement revealed that some factors have direct effects on academic performance such as depression (Hamaideh & Hamdan-Mansour, 2014; Turashvili & Japaridze, 2012), and loneliness (Banjong, 2015; Weeks, Michela, Peplau, & Bragg, 1980). Whereas, others have just mediating roles such as student engagement (Jelas, Azman, Zulnaidi, & Ahmad, 2016). For example, in their study on the relationship between post-traumatic stress disorder (PTSD) and academic achievement, Boyraz et al. (2013) demonstrated that PTSD symptomatologically is not directly associated with grade point average (GPA-as an index for academic achievement), but PTSD has mediating role.

The direct or indirect impacts of factors may depend on the individual roles of factors and the interaction among variables in a multi-factor study. Originally, the concept of direct and indirect impacts of factors in a set of variables goes back to Sewell Wright's (1918 as cited in Kline, 2011) works on statistical analysis that is called path analysis. The bio-geneticist, Wright demonstrated that observed covariances among a set of variables could be related to the parameters of a model that represents both direct and indirect effects among those variables (Kline, 2011). Wright (as cited in Kline, 2001) also argued that these covariances can be shown through path diagrams indicating how these effects could be estimated from sample data.

However, such direct and indirect analysis is currently used to identify the mediating factors and the effect size of each factor in multi-factor studies (Kerlinger & Lee, 1999; Kline,

2011; Meyers, Gamst, & Guarino, 2006). For example, through using path-analysis, Swami et al. (2007) demonstrated that loneliness can mediate the direct effects of health and life-satisfaction on depression. Using the same method of analysis, Olmstead et al. (2016) found the mediating role for loneliness in academic adjustment. Conducting a multi-variable study through the use of structural equation modeling, Tian, Zhang, Wu, Wang, Gao, and Chen (2018) examined the mediating role of loneliness and depression in life satisfaction and found that loneliness and depression played fully negative mediating (indirect) effects on life satisfaction. Also, in their study on the mediating role of loneliness in relation to spirituality and health, Gallegos and Segrin (2018) found that "loneliness acts as a suppressor variable in the relationship between spirituality and depression for Latinos" (p. 8).

Determining such direct or indirect impacts, which represent the main or mediating roles of factors, depends on 1) the number of factors in a study (Beshlideh, 2012; Meyers et al., 2006), 2) the type of method used in a study (such as path analysis - Beshlideh, 2012; Kline, 2011), and 3) the nature of construct (e.g., unidimensionality or multidimensionality- Beshlideh, 2012; Meyers, Gamst, & Guarino, 2006).

Although academic achievement is a multi-dimensional phenomenon (Hill, 2008; Merriam, 2008) involving different psycho-social (Ilgan, 2013; Salanova, Schaufeli, Martınez, & Breso, 2009) and physiological influences (Boyraz et al., 2013), it is argued that previous studies did not fully investigate such influences, particularly psycho-social factors (Boyraz et al., 2013; Ilgan, 2013; Sahin, Çekin, & Özçelik, 2018). For example, Ilgan (2013) emphasized that a study of academic achievement requires multi-relational models to determine how different factors interact with each other to affect academic achievement directly or indirectly, whereas such models were rarely used. Sahin et al. (2018) argued that to study academic achievement as

complex phenomenon, different factors such as socio-demographics, personality traits, motivational factors, and attitudes should be considered.

A classification of different factors may help portray a multi-relational model appropriately (Beshlideh, 2012; Meyers, Gamst, & Guarino, 2012). After a review of Vargas' (2007 as cited in Iglesia et al., 2014) categorization of the major influences of academic achievement and Hill's (2008) and Merriam's (2008) views about multidimensionality of academic achievement, the following classification was generated in the present study; that includes 1) *cognitive factors* (e.g., self-regulation – Cigdem, 2015; Kim et al., 2015, Liao et al., 2012), 2) *mental health-related factors* (e.g., depression and anxiety – Hamaideh et al., 2014; Quan et al., 2014), 3) *social factors* (e.g., loneliness - Bhagchandani, 2017; Iglesia et al., 2014), and 4) *socio-demographic factors* (e.g., age and gender–Ilgan, 2013). This categorization also includes all predictors of academic success based on Kim et al.'s (2015) research in which 10 determinants of academic achievement were found. Likewise, it is also based on Ilgan's (2013) findings about the predictors of academic performance.

Based on this classification, this literature review (see Chapter II) showed that the separate roles of three major factors including *depression* (Deb, Parveen, Thomasa, Vardhan, Rao, & Khawaja, 2016; Lund, Chan, & Liang, 2014), *loneliness* (Benner, 2011; Grimm, 2007) *and self-regulation* (cognitive regulation- Legault & Inzlicht, 2013; Liao et al., 2012; Sandars & Cleary, 2011) in academic achievement were central to a number of contemporary studies. However, the current literature review (see Chapter II) revealed that these studies have several deficits: 1) Such studies were either focused on the individual roles of the above-noted factors in academic achievement, or at least two-variable studies were conducted. Thus, the inter-relationships among the contributing variables and academic achievement were not studied. 2)

Previous studies were not focused on a structural method to determine the main and mediating roles among these contributing factors. The structural methods determine the major ways through which such variables interact with each other to increase their degree of impact on dependent (criterion) variables (e.g., academic achievement- Beshlideh, 2012; Meyers, Gamst, & Guarino, 2012). The impact degree can be explored by path analysis as a method of structural equation modeling (SEM-Ghasemi, 2010; Meyers, Gamst, & Guarino, 2012) or multiple regression. To examine the main and mediating roles of each factor, the position of each variable should be changed in the equation to create some statistical models hypothetically. These models will be argued in the third chapter.

3) Even if it is supposed that there are some well-documented studies about the separate roles of such factors in academic achievement, the replication (verification) of such studies was not done in the current research population to ensure that whether there are stable associations amongst such phenomena. Since the replication and verification of research is highly recommended in scientific methodology (Andersen & Hepburn, 2016; Popper, 2005; Wiersma et al., 2009) and because each statistical population has its own specific characteristics, the current study was devised to either corroborate or reject the roles of above noted variables in academic achievement in the targeted participants of this study. 4) Previous studies were mostly focused on one specific student population (see Chapter II); whereas, the current research aimed to study both international and Canadian students comparably. In addition to addressing some limitations of previous research, the present study aimed to add to the body of knowledge regarding the experiences of international and domestic students in post-secondary education in the following ways.

1) Since each of these contributing factors represents one of the main psychological domains including cognitive, social, and affective domains (Håkansson, 2010; Santrock, MacKenzie-Rivers, Leung, & Malcomson, 2005), it is assumed that exploring their interrelationships may crystalize how these domains affect each other regarding academic achievement. 2) This study will help mental health practitioners and professionals to realize how international students experience their academic journey and how they deal with its positive or negative consequences. 3) The current comparable study can help educators and educational policy makers design effective pedagogy for students' academic achievement based on the similarities and differences between such students.

4) The nature of this study and its method will also help the scientific researchers to further understand what some consider the paradoxical view of unidimensionality or multidimensionality of academic achievement (Iglesia et al., 2014). 5) Finding the effect size of each predictor of students' academic achievement will also help mental health practitioners and educators to prioritize their intervention programs and work efficiently with such predictors (e.g., depression, loneliness, and cognitive regulation) in domestic and international students. 6) The results of current research could be used to help psychologists at the university counseling center to develop specific intervention programs for students who have difficulties in depression, loneliness, and self-regulation that affect their academic experience. Additionally, exploring the role of some socio-demographic influences (such as gender and social connectedness) in the contributing factors (e.g., depression, loneliness, self-regulation, and academic achievement) will provide extra information to improve the authenticity of mental health intervention programs. The following definitions will build an authentic picture of the above-noted factors.

Key Definitions

Depression: As a mental health condition, is characterized by feeling sad or having a depressed mood, loss of interest or pleasure in activities once enjoyed, changes in appetite — weight loss or gain unrelated to dieting, trouble sleeping or sleeping too much, loss of energy or increased fatigue, increase in purposeless physical activity (e.g., hand-wringing or pacing) or slowed movements and speech (actions observable by others), feeling worthless or guilty, difficulty thinking, concentrating or making decisions, thoughts of death or suicide (APA-DSM-5, 2013). Distinguishing Depression (with capital *D*) as a mental disorder from symptoms of depression (with lower case *d*), Depression is considered as a clinical diagnosis that is measurable by tools such as KADS-11.

Self-regulation: It refers to a cognitive emotion regulation which is characterized by a set of cognitive strategies through which individuals are able to manage personal emotions, thoughts, feelings, and wishes as well as activities to achieve desired outcomes and fulfil a variety of individual needs (Carey, Neal, & Collins, 2004; Corsini, 1999; Garnefski & Kraaij, 2007; Trommsdorff, 2009). These strategies are divided into two categories including adaptive and maladaptive cognitive strategies (Garnefski & Kraaij, 2007; Garnefski, Grol, Kraaij, & Hamming, 2008). Maladaptive cognitive strategies include rumination, self-blaming, catastrophizing, and other-blame. Adaptive regulation strategies consist of acceptance, positive reappraisal, positive refocusing, refocus on planning, and putting into perspective (Garnefski et al., 2007; Jermann, Van der Linden, d'Acremont, & Zermatten, 2006; Marroquin, & Nolen-Hoeksema, 2015).

Loneliness: It refers to an afflictive and enduring state of emotional, cognitive, and social experience through which individuals display the following symptoms: Feeling distress for being ignored or rejected by others, feeling strange in an environment (Solomon, 2000). Also, loneliness, as a multidimensional phenomenon (Chipuer, 2004), is characterized by three biopsychosocial domains including 1) *distressed feelings*, which refers to emotional experiences such as feeling silly, empty, upset, not right, disappointed, confused, sad, and bored. 2) *Social rejection* (refers to social experiences such as having no one to talk with, being rejected by peers or being left out), and 3) *references to self*, which refers to cognitive experiences such as a sense of being different or being in your own world (Chipuer, 2004; Solomon, 2000).

Academic Achievement: It originally represents a degree of academic performance by which a student has accomplished specific goals of learning such as the acquisition of knowledge and understanding in a specific intellectual domain which generally called discipline (Steinmayr, Meißner, Weidinger, & Wirthwein, 2015). Academic achievement was also defined as a degree of learning or a specific level of expertise in different areas of inquiry or research that was accomplished through a formal education at schools, colleges, or universities (Cigdem, 2015; Corsini, 2002; Hamaideh et al., 2014). This construct is usually characterized through different methods such as students' scores called grade point average (GPA), educational progress report of students (Saadat, Ghasemzadeh, & Soleimani, 2012), or asking students to determine their academic performance based on self-report questions (Pittman & Richmond, 2007). In this study, the academic achievement was measured by self-report questions (see Appendix 3 and 7).

Grade point average (GPA)*:* GPA is a worldwide index used by numerous studies to measure students' academic achievement or performance (DeFreitas & Rinn, 2013; Kim et al., 2015; Poyrazli, 2015; Salanova et al., 2009; York, Gibson, & Rankin, 2015). GPA is usually

characterized by scores (e.g., 3.75), which has a range between 0 and 4.3 equivalent to 0 to 100 (York et al., 2015).

***International Students**:* This term refers to a group of students who are not native or domestic students and are usually described as sojourners in another country (Wang & Mallinckrodt, 2006). McKinley (2019) defined international students as a "broad category of students from diverse countries regardless of visa or legal documentation status" (p. 174). In psycho-educational literature, these students are also called overseas students, foreign students, cross-border students, (Abdullah, Abd Aziz, & Ibrahim, 2014; McGill, 2013; Muller & Daller, 2019; Nguyen, 2013; Saravanan, Mohamad, & Alias, 2019). All these terms represent those students who have chosen to travel to another country to pursue their academic studies (Laughlin, 2014; Liu, 2009). With regard to Canada, international students are mostly from five countries namely China, India, South Korea, France, and Vietnam (CBIE/BCEI, 2018). Regarding Mount Saint Vincent University (MSVU), in which this research was conducted, most international students were from China, Bahama, Ghana, and India (Office of Institutional Analysis-MSVU, 2018). However, there were several students from other countries studying in MSVU. These definitions helped the researcher to have an authentic literature review (Chapter II) that led posing several research questions after the exploration of previous studies.

Chapter II: Literature Review

The purpose of this chapter was to explore the current knowledge about the inter-relationships among the contributing factors and academic achievement and to provide an appropriate methodological model. Chapter two will provide information helpful to explain each of the contributing factors, their relationships with academic achievement, the contemporary findings about the inter-relationships among all the factors as well as formulating the research questions.

Depression and Academic Achievement

1. A conceptual framework

American Psychiatric Association (APA) and World Health Organization (WHO) along with other official agencies such as the Public Health Agency of Canada (PHAC) have provided clinical-scientific frameworks to define and conceptualize mental health and mental disorders (APA-DSM-5, 2013; Marburg, 2013; Manwell, Barbic, Roberts, Durisko, Lee, Ware, & McKenzie, 2015; Paterniti, 2017; Stein, Phillips, Bolton, Fulford, Sadler, & Kendler, 2010). These frameworks (e.g., Diagnostic and Statistical Manual of Mental Disorder-DSM) have been consistently upgraded through modern evidence-based research (APA-DSM-5, 2013; Kogan & Paterniti, 2017; Marburg, 2013). Pursuing such frameworks, some researchers argued that Depression and depressive symptoms should be conceptualized based on the current understanding of mental health, mental health distress, mental health problems, and mental

disorders (see Figure 1 - Houpt Jr, 2010; Gruenberg, Goldstein, & Pincus, 2005; Kutcher, 2012, 2015; Manwell, Barbic, Roberts, Durisko, Lee, Ware, & McKenzie, 2015; Stein, Phillips, Bolton, Fulford, Sadler, & Kendler, 2010).

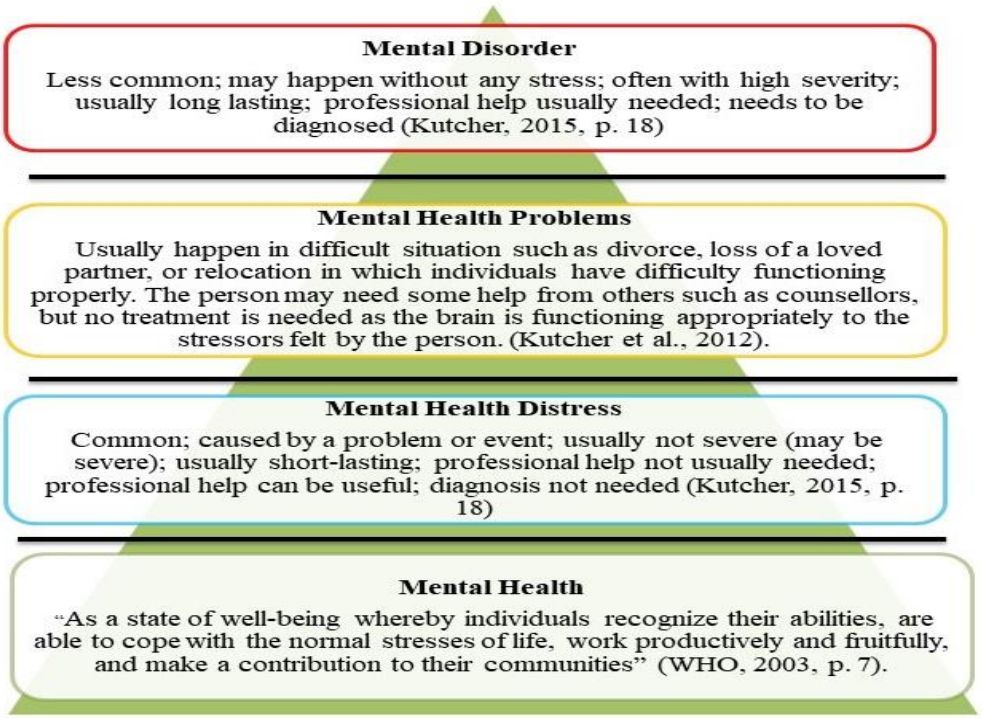


Figure 1: Different Categorical States of Mental Health (adapted from Kutcher, 2012, 2015)

Based on such frameworks (e.g., DSM and WHO), mental health is considered as a fundamental and essential constituent of health. The World Health Organization constitution states: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 2018). Although some researchers rely on WHO's (2018) definition of mental health (see Figure 1; Leighton & Dogra, 2009), others endeavored to have a new definition of mental health (Galderisi, Heinz, Kastrup, Beezhold, & Sartorius, 2015; Leighton & Dogra, 2009). For example, Galderisi et al. (2015) in their article named "*Toward a New Definition of Mental Health"* defined mental health as:

> a dynamic state of internal equilibrium which enables individuals to use their abilities in harmony with universal values of society. Basic cognitive and social skills; ability to recognize, express and modulate one's own emotions, as well as empathize with others; flexibility and ability to cope with adverse life events and function in social roles; and harmonious relationship between body and mind represent important components of mental health which contribute, to varying degrees, to the state of internal equilibrium (p. 231).

However, Manwell et al. (2016) argued that there is not a broad consensus about such definitions of mental health as well as WHO's definition. Manwell et al. (2016) used a validity survey to measure the rater agreement on 4 popular and current definitions of mental health. Fifty individuals with expertise in mental health from 8 countries participated in their research, and the result indicated that "46% of respondents rated the Public Health Agency of Canada (PHAC, 2008) definition as the most preferred, 30% stated that none of these definitions were satisfactory and only 20% said the WHO's (2001, 2003) definition was their preferred choice" (p.1). Moreover, in the Diagnostic and Statistical Manual of Mental Disorders (APA-DSM-5, 2013) it was argued that the definition of mental health and mental disorder is still controversial without a general agreement (Stein et al., 2010).

Nevertheless, some argued that mental health refers to the health of brain when the brain functions appropriately. Such functions include thinking (cognition), emotion or feeling, perception (sensing), physical arousal (somatic), behavior, and signaling (Kutcher & Chehil, 2009). This definition is aligned with the definition of Public Health Agency of Canada (2008, 2020) in which positive mental health is "the capacity of each and all of us to feel, think, act in ways that enhance our ability to enjoy life and deal with the challenges we face. It is a positive sense of emotional and spiritual well-being that respects the importance of culture, equity, social justice, interconnections and personal dignity".

Mental health problems usually happen in difficult situation such as divorce, loss of a loved partner, or relocation in which individuals have difficulty functioning properly. These life stressors lead to the brain functioning coming into play as noted above. While the person may need some help from others such as counsellors, no treatment is needed as the brain is functioning appropriately to the stressors felt by the person (Kutcher et al., 2012). Hence, the regulation in brain functions has main role to define and differentiate different mental states (e.g., depression) in human functioning (Gotlib, & Hamilton, 2008; Kutcher & Chehil, 2009; Kutcher, 2015; Kutcher, Bruce, & Etches, 2012; Murphy, 2015, 2017). Since all of the brain functions are interconnected and work integratively, the roles of each brain function such as cognitive, behavior, signaling or mood should be considered to characterize a particular state. Mood, for example, is a subjective experience fluctuating between phases (Kutcher & Chehil, 2008, 2009). As the Figures 2 and 3 show, in each phase, different experiences may occur from happy to calm and from calm to depressed or elated phase.

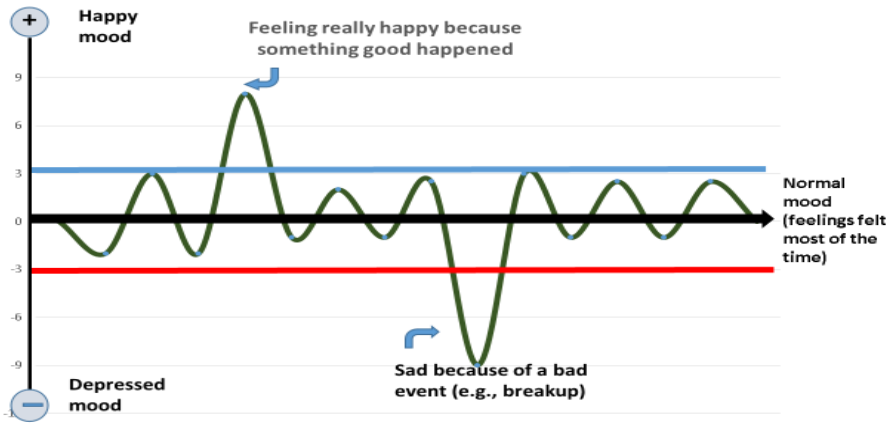


Figure 2: The Fluctuation of Mood During Time (adapted from Kutcher & Chehil, 2009, p. 13)

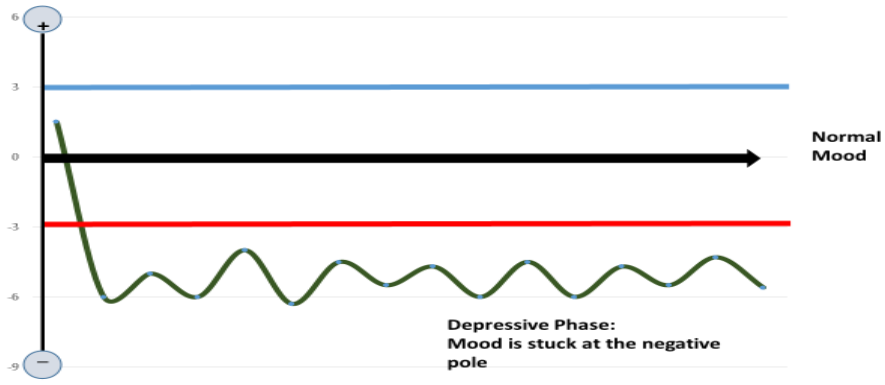


Figure 3: Depressive Phase (adapted from Kutcher & Chehil, 2009, p. 13)

These experiences may be exhibited via a pattern of dysregulation by several symptoms in mood, thinking (cognition), and body sensation. For example, such dysregulated symptoms in depression are depressed or irritable mood, excessive and inappropriate guilt, loss of interest, low morale, a sense of hopelessness, suicidal thoughts, lack of happiness and self-worth, withdrawal, psychomotor retardation, and other symptoms (APA-DSM-5, 2013; Kutcher, 2015; National Institute of Mental Health, 2016). Although such negative changes in mood may reveal that a person is likely in a depressed phase, the current clinical-scientific framework (such as DSM-5) requires additional criteria to conceptualize depression. These criteria include but not limited to DSM-5 criteria (e.g., the number of symptoms, the severity of symptoms, and the degree of functional disability), diagnosing scales (e.g., Kutcher Adolescent Depression Scale (KADS-11), functional assessments, and clinical interview.

Pursuing such criteria, clinical researchers and practitioners argued that Depression (with capital *D*) as a mental disorder (clinical depression) is different from depressive symptoms which is used with lower case "*d*" (APA-DSM-5, 2013; Gruenberg, Goldstein, & Pincus, 2005; Houpt Jr, 2010; Kutcher & Chehil, 2009).

Houpt Jr (2010) demonstrated that depression (with lower case *d*) or depressive symptoms refers to the concept of sadness and other symptoms of lower mood that individuals may feel in their everyday life and usually describe themselves as "depressed". Whereas, Depression (with capital *D*) refers to the formal diagnosis of clinical Depression that is measurable by clinical tools (e.g., KADS-11), which can provide both categorical (diagnostic threshold) and summative (intensify) measures. DSM-5 outlined the major common features of this category of disorder (Depression) as including the "presence of sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function" (APA-DSM-5, 2013, p. 155). The affected individual's capacity to function may be exhibited through different patterns of social, personal, and family problems as well as poor vocational/educational performance (Kutcher, 2015).

Apart from determining the objective differentiating features of depressive symptoms and Depression, this differentiation provides some other implications for the current research. These implications include: a) carrying out an appropriate (realistic) evaluation of the prevalence of clinical depression and depressive symptoms in university students, b) introducing reliable tools (e.g., KADS-11) to the primary study of depression in students, c) providing the researcher with an objective perspective to examine the effects of depression on students' different emotional, cognitive and socio-educational functions (e.g., academic achievement), and d) it provides a framework for analyzing the roles of environmental and social factors in students' depression.

Focusing on these benefits, the realistic evaluation of the prevalence of clinical depression and depressive symptoms in university students and the effects of depression (depressive symptoms) on students' different emotional, cognitive (e.g., loneliness and self-regulation), and socio-educational functions will be explored in the following.

2. Prevalence of Depression (clinical depression) and depressive symptoms

A review of literature revealed that the rate and the prevalence of Depression and depressive symptoms in three different groups have been estimated. These groups include general population, clinical population, and students in different educational levels (e.g., schools, colleges, and universities).

A. Prevalence of Depression and depressive symptoms in clinical and general population

Contemporary studies showed that Depression is a significant problem in different age populations (WHO, 2017). The World Health Organization (2017) estimated that 4.4% of people suffered from Depressive disorder around the world in 2015. The total Depressive people in 2017 was estimated 322 million globally (WHO, 2017). The distribution of this number was 21% for Western Pacific Region, 27% for South-East Asia Region, 15% for Region of the Americas, 12% for European Region, 9% for African Region, and 16% for Eastern Mediterranean Region. This distribution shows that the global estimation varies in terms of WHO regions (WHO, 2017). Generally, WHO (2017) reported that individuals with Depression increased globally by 18.4% from 2005 to 2015. In 2020, WHO reported that more than 264 million people affected Depression. This estimation was also reported by Global Burden of Diseases/Global Health Metrics (2019).

Recently, a systematic meta-analysis of 90 studies across 30 countries by combining 1 million participants revealed that the aggregate point prevalence of Depression was 12.9%, one-year prevalence was 7.2%, and lifetime prevalence was 10.8% from 1994 to 2014 (Lim, Tam, Lu, Ho, Zhang, & Ho, 2018). Thornicroft et al. (2017) used World Mental Health Survey

Initiative (WMHSI) to examine the prevalence of Depression in 51,547 samples (aged 18 years and older) across 21 countries and reported a 4.6% estimate for 12-month prevalence of Major Depressive Disorder (MDD). Comparing Thornicroft et al.'s (2017) estimation with the results of WHO (2017, 2018), Heslin (2020) argued that the prevalence of Depression in both studies is roughly similar.

This estimate is very close to what Lam et al. (2016) reported in their meta-analysis for Major Depressive Disorder (MDD) in Canadian general population. Lam et al. (2016) argued that the annual prevalence of MDD in Canadian general population is 4.7%. Generally, in Canada, it was estimated that 1 in 5 Canadians will experience a mental health illness in their lifetime (Centre for Addiction and Mental Health-CAMH, 2011). This estimation was also approved for 2018 indicating that by the time Canadians reach 40 years of age, they may experience a mental health problem or disorder (CAMH, 2018).

Although clinical depression can affect individuals in different ages, studies in last two decades reported that Depression (clinical depression) can affect adolescents and young adult population causing impairments in their social functions and academic achievement (Lam et al., 2016; Mojs, Warchoł-Biedermann, Głowacka, Strzelecki, Ziemska, & Samborski, 2013; Yan et al., 2019). Heslin (2020) argued that the combined data from all of the developed countries showed an increased rate of Depression (7.0%) in the youngest age group (18-34 years old) compared with a low of 2.6% in the oldest age group (65 and older). This is roughly similar to what was estimated for Canadian adolescents and young adults (Lam et al., 2016) since it was estimated that 5% of Canadians may develop Depression between 15 and 25 years of age (CAMH, 2018; Kutcher, Bruce, & Etches, 2012).

In addition to the investigation of Depression, some researchers examined the prevalence of depressive symptoms among general population (Cao et al., 2020). Using self-report questionnaires in their research on 10,257 American adults, Cao et al. (2020) found that the prevalence of depressive symptoms was 8.0% for all participants from 2015 to 2018.

B. Prevalence of Depression and depressive symptoms in university students

The literature review showed that there are two types of studies in which the prevalence of Depression and depressive symptoms in college and university students were researched globally. The first group of studies were focused on the generic description of depression and examined the prevalence of depressive symptoms (depression) among students across different global regions such as Asia (Albajjar & Bakarman, 2019; Alenazi, Hammad, & Mohamed, 2019; Christopher, & R., 2019; Cuttilan, Sayampanathan, & Man Ho, 2016; Kumari, Langer, Jandial, Gupta, Raina, & Singh, 2019; Li et al., 2015), Africa (Gesinde & Sanu, 2014), Europe (Hajduk, Heretik, Vaseckova, Forgacova, & Pecenak, 2019; Mojs et al., 2013), and North America (Hop Wo, Anderson, Wylie, and MacDougall, 2020; Meckamalil, Brodie, Hogg-Johnson, Carroll, Jacobs, & Côté, 2020).

In Africa, Gesinde and Sanu (2014) used KADS-11 for the assessment of depression in 550 students who were selected from three universities in Nigeria and demonstrated that the existence of depressive symptoms among students was common. They argued that students with depressive symptoms ranged from 11.45% to 35.81% for both sexes; 11.48% to 25.82% for males; and from 11.44% to 23.20% for females. Regarding Asian students, after screening 1,033 articles, Cuttilan et al. (2016) conducted a systematic study on 14 articles and reported that depression (depressive symptoms) had 11% prevalence in medical students.

In one European city (named Bratislava), Hajduk et al. (2019) examined 1,331 students at Comenius University through a cross-sectional online survey and found that generally 35.5% of students were suffering from depressive symptoms. However, after using the stringent criteria for the intensity of symptoms, the prevalence was corrected as 16.4% for depressive symptoms. Likewise, Mojs et al. (2013), studied 1,183 university students in Poznan by using KADS-6 and found that 6.5% of students had depression. Dividing students in terms of the year of entrance, discipline, and gender, Mojs et al., (2013) demonstrated that depression was common in freshmen students (13.2%), in psychology students (16.7%), and in female (7.7%) compared with other groups.

In Canada, Hop Wo et al. (2020) used the "National College Health Assessment – American College Health Association Spring 2013 Survey", which includes 34,039 participants in 32 post-secondary institutions across Canada. In this secondary analysis, Hop Wo et al. (2020) studied and estimated the prevalence of Depression and depressive symptoms along with other mental health difficulties. Regarding depressive symptoms, Hop Wo et al. (2020) reported that 41.58% of Aboriginal students and 37.38% of Non-Aboriginal students reported depressive symptoms indicating that the prevalence ration (*PR*) for depressive symptoms within 12 months was $PR = 1.11$ in both groups. However, the prevalence ration for Indigenous samples who have been given the diagnosis of Depression was 1.26. In relation to having a lifetime diagnosis of Depression, Indigenous students showed the prevalence of $PR = 1.31$. However, the data Hop Wo et al. (2020) used for their study was obtained from 2013.

Recently, the prevalence of depressive symptoms in 766 undergraduate students was measured through using Depression Anxiety Stress Scale -21 at Canadian Memorial Chiropractic College (Meckamalil, Brodie, Hogg-Johnson, Carroll, Jacobs, & Côté, 2020). Their research

showed the prevalence of 19 % for overall samples without any significant gender differences (Meckamalil et al., 2020).

The second type of studies were focused on the prevalence of Depression as a mental disorder among university students (Ashraful Islam, Low, Tong, Yuen, & Abdullah, 2018; Auerbach et al., 2018; Ebert et al., 2019). For example, on the basis of WHO - World Mental Health International College Student Project and through using different diagnostic and functional scales, and DSM criteria, 13,984 college and university students in eight countries (e. g., Australia and United States) were examined for the prevalence of different mental disorders (Auerbach et al., 2018). In this survey, Auerbach et al. (2018) reported that "Major Depressive Disorder (MDD) was the most common of the disorders examined across all countries combined (21.2% lifetime prevalence; 18.5% 12-month prevalence) followed by generalized anxiety disorder (18.6–16.7%)" (p. 9).

Through a large survey on 37,600 secondary school students in Ontario, Boak, Hamilton, Adlaf, Henderson, and Mann (2018) reported that almost 5% of students were prescribed medication for the diagnosis of Anxiety, Depression, or both conditions in the past year. Also, Findlay (2017) used Canadian Community Health Survey–Mental Health (CCHS–MH), to examine depression and suicidal ideation among 4,031 Canadians aged 15 to 24 and reported that "11% of 15- to 24-year-olds had been depressed in their lifetime; 7% had experienced depression in the past year" (p. 7). Of those with depression, 61% had visited a professional about their symptoms in their lifetime and were prescribed for medication (Findlay, 2017).

Such prevalence has raised concerns among researchers, educational policy makers, and health professionals over the educational and psycho-social consequences of Depression and

depressive symptoms in students (Beiter et al., 2015; Bruffaerts et al., 2018; Iqbal, Gupta, & Venkatarao, 2015; Kong et al., 2015; Lund, Chan, & Liang, 2014; Turashvili & Japaridze, 2012).

Regarding Canadian university students, there are several reasons that make scholars concerned about the prevalence of depressive symptoms and Depressive disorder (Depression) and its consequences in students. First, the population growth of young adults across Canada (Worldometers, 2017) and particularly in the province of Nova Scotia is estimated to be relatively stable up to 2036 (NSHRF, 2013). Although the population growth of young adults for Nova Scotia was estimated to be 18.11% in 2036, comparing this rate with the estimation of 21% for 2015 shows that the population growth will also be roughly stable for Nova Scotia (NSHRF, 2013). However, a remarkable size of this population in Canada are adolescents and young adults (aged between 18 and 30 years old) who have been college or university students (Statistics Canada, 2015, 2017).

Second, a considerable portion of the Canadian university population (almost 10%) belongs to international students (Statistics Canada, 2015, 2017; Global Affairs Canada, 2019). Unfortunately, some studies showed that international students may be more at risk of mental health difficulties (Forbes-Mewett et al., 2011; Poyrazli, 2015). In one study in United States, Poyrazli (2015) demonstrated that 18% of international students experienced depression (depressive symptoms) during their academic journey. Also, 71% of these students were concerned about academic progress and 28% experienced a sense of loneliness. Third, the need of using mental health services is increasing in Canadian academic institutions (Canadian Association of College & University Student Services and Canadian Mental Health Association-CACUSS & CMHA, 2014; Heck et al., 2014).

Fourth, depression is not only one of the most prevailing reported indexes of need for mental health intervention in Canadian students (Centre for Addiction and Mental Health-CAMH, 2011, 2018; Szumilas et al., 2010), it has also been as a major problem in the United State (Brody, Pratt, & Hughes, 2018; Castillo & Schwartz, 2013; Kutcher, Gilberds, Morgan, Udedi, & Perkins, 2015; WHO, 2017). A survey conducted with 30,000 American university students across 39 campuses revealed an increase of 15.4% in students' depressive symptoms (American College Health Association, 2011 cited in Castillo & Schwartz, 2013).

Fifth, scholars have recently focused on the capacity of educational settings to help mental health professionals implement a mental health curriculum in the form of mental health literacy to reduce or remove many negative consequences of mental health difficulties across educational settings (Kutcher & Wei, 2012; McLuckie, Kutcher, Wei, & Weaver, 2014; Wei, Carr, Kutcher, & Alaffe, 2019). In addition to schools, which is the main targeted educational settings for such programs, having such programs in colleges and universities indicates that university students also are in need of mental health programs for their depressive symptoms (Heck et al., 2014; Nguyen Thai, & Nguyen, 2018; Pin & Chris, 2012; Rafal, Gatto, & DeBate, 2018).

These above-noted reasons reveal that the study of psycho-educational consequences of Depression or depressive symptoms, such as lower academic achievement, in college and university students globally and particularly in Canada should be central.

3. Effects of Depression/depressive symptoms on academic achievement

Recent studies demonstrated that depressive symptoms along with other factors such as bullying can negatively affect students' academic achievement (Charoenwanit, 2019; Davis et

al., 2018). Collecting data about students' academic achievement and depression (depressive symptoms) through using the Thai version of the Center for Epidemiologic Studies-Depression Scale (CES-D) and the General Health Questionnaire (GHQ-28), Charoenwanit (2019) examined 400 adolescents attended in different high school in 4 regions of Thailand. He found that students who were in the victim/bully group suffered more from depressive symptoms than other groups, resulted lower academic achievement (Charoenwanit, 2019).

More specifically, Deb et al. (2016) used a self-report depression scale (University Student Depression Inventory-USDI) to examine the relationship between students' academic achievement and depressive symptoms on 717 Pondicherry University students. The results revealed that fifty five percent of students with high scores on the self-report depression scale felt academically stressed with lower academic performance (Deb et al., 2016).

Using Kutcher Adolescent Depression Scale (KADS-6), Coping Inventory for Stressful Situation (CISS), and Ryff's Well-Being Scale, Turashvili et al (2012) demonstrated that many students at Georgia University in the USA reported having depressive symptoms and challenges with a low level of psychological well-being that affected their learning performance negatively. On the contrary, those students who had a medium or high level of learning performance showed a high index of well-being and low levels of depression (Turashvili et al., 2012). Additionally, depressive symptoms, as a common debilitative psychological condition (Bachner, O'Rourke, Goldfracht, Bech, & Ayalon, 2013), correlates with post-graduation plans, students' financial concerns, the quality of sleep, negative body image, low self-esteem, and overall health (Beiter et al., 2015; Mohammed, Tharayil, Gopakumar, & George, 2020).

Using a qualitative method, Yang and Noels (2013) interviewed 93 international students and found that depression (depressive symptoms) could affect students' psychological adjustment and academic performance. Other studies revealed that depression can create negative consequences for students such as smoking behavior (Mee, 2014), low academic achievement (Hamaideh et al., 2014; Maurizi, Grogan-Kaylor, Granillo, & Delva, 2013), and low academic adjustment (Briere, Janosz, Fallu, & Morizot, 2015).

In one study on 700 students, Khurshid, Parveen, Yousuf, and Chaudhry (2015) used Depression Screening Test (DST) and Academic Performance Rating Scale (APRS) to study the relationship between different levels of students' scores on DST and their scores on APRS. They demonstrated that there was a significant difference between the academic performance of students and their low, medium, and high levels of scores on DST. Similar results regarding the correlation of depression and academic performance were found by Beiter et al., (2015) indicating that depression had a high effect size in predicting students' GPA. Turner et al. (2012) found that the different levels of depression had different effects on academic performance. Likewise, DeRoma et al. (2009) argued that students who had a moderate level of scores on the Beck Depression Inventory-II (BDI-II) were worse in their academic performance than those whose scores on BDI-II symptoms were mild.

Generally, based on these studies, depression may have a significant association with academic achievement (Jones, 2008; Turashvili et al., 2012), and may show different effect sizes of correlation when different levels of student's scores on depressive scales are considered (Turner et al., 2012; Walkiewicz, Tartas, Majkowicz, & Budzinski, 2012). However, such statistical associations between depression and students' academic achievement should be obtained mostly through measuring the role of other variables (Jones, 2008; Khurshid et al.,

2015; Turner et al., 2012). Entering any other types of factors in a study may change the effect size of depression on academic achievement. This possible change may depend on the nature of co-factors or comorbid problems such as loneliness.

Loneliness and Academic Achievement

1. The nature and characteristics of loneliness

The first scientific article about loneliness goes back to Frieda Fromm-Reichmann's psychoanalytic work (Cacioppo & Hawkley, 2009); although, Sullivan's (1953) psychoanalytic theory (Brage, Meredith, & Woodward, 1993) and Winnicott's (1957 as cited in Buchholz & Catton, 1999) theory are considered as the first theoretical works about loneliness. These perspectives stress that loneliness, as a core element in psychopathology, is central in the field of mental health and has main role in individuals' different functions. Winnicott, however distinguished '*capacity to be alone'* from '*pathological loneliness*' (1957 as cited in Buchholz et al., 1999). Apart from these theories that influenced psychiatrists and psychologists to have a symptomatological view about loneliness, some of contemporary researchers studied loneliness within a bio-genetic model (e.g., genetic patterns of loneliness - Van Roekel et al., 2010) or evolutionary model (Cacioppo et al., 2009; Layden, Cacioppo, & Cacioppo, 2018). However, emerging from the models of such contemporary studies, loneliness was described either as a unidimensional entity (Cramer & Barry, 1999; McWhirter, 1990) or as a multidimensional phenomenon (Chipuer, 2004; Maes, Noortgate, & Goossens, 2015).

Unidimensionality: In this model loneliness is described as a "unitary and global phenomenon that varies in the intensity and experience" (McWhirter, 1990, p. 418). This challenging view argued that loneliness is the same across situations and diverse populations, for

example, loneliness in university students is similar to loneliness in soldiers (Cramer et al., 1999).

Although this model defines loneliness either emotionally or socially, the pros of unidimensionality tend to focus on the social dimension and give more contribution to social factors in creating loneliness. For example, Mikulincer and Segal (1990) focused on the unidimensional perspective and introduced seven major social factors that generated loneliness episodes. Of these factors, lack of emotional bonds with others, and lack of caring people were highly reported by respondents in Mikulincer's and Segal's (1990) research. Moreover, loneliness is characterized by individuals' impaired social relationship or functions (Hughes et al., 2004; Russell, Peplau, & Cutrona, 1980; Smith, & Victor, 2019). Such findings may impose an idea in which there is no sense of loneliness in individuals who have positive social relationships with others such as friends or family members. Based on this model a popular scale named UCLA Loneliness Scale was structured to measure loneliness in social relationships (Hughes et al., 2004; Nazzal, Cruza, & Neto, 2018; Public Health England, 2019; Russell et al.,1980).

However, the nature of social relationships has different aspects or layers such as a happy relationship, emotional caring, and financial supporting (Le Roux & Connors, 2001). These layers have generated many critiques of this model. Le Roux and Connors, (2001) studied the effects of three types of happy relationships including happy, neither happy nor unhappy, or unhappy parental relations on a sense of loneliness. After recruiting two groups of students (188 senior students from the Charles Sturt University in New South Wales and 104 Afrikaans-speaking students from the University of Free State in Bloemfontein), Le Roux et al. (2001) measured the sense of loneliness in terms of students' family relationships and found that those

students who had grown up in happy family, felt more lonely than other groups. This finding was interpreted by the influence of other factors such as parental financial support at the time of starting university; that is, growing in an only happy family is not enough to prevent students from loneliness (Le Roux et al., 2001). This finding reveals that even in a unidimensional model, one factor has different aspects or layers with different influences on loneliness.

Multi-dimensionality: In contrast to unidimensional perspective, the multi-dimensional perspective not only describes various aspects or domains of loneliness, but also it focuses on different brain-related and biological factors in loneliness as well as social factors (Allen-Kosal, 2008; Cacioppo et al., 2009; Chipuer , 2004; Praizendorf, Lubimova, & Kuzmina, 2019; Qualter, Brown, Munn, & Rotenberg, 2010; Rokach, 2014; Shaked & Rokach, 2014). Chipuer (2004) demonstrated that three dimensions are involved in loneliness: *distressed feelings* (refers to emotional experiences such as feeling silly, empty, upset, not right, disappointed, confused, sad, and bored), *social rejection* (refers to social experiences such as having no one to talk with, being rejected by peers or being left out) and *references to self* (refers to cognitive experiences such as a sense of being different or being in your own world). In line with the view of multi-dimensionality, Allen-Kosal (2008) stated that at least four components have been identified as core constituents of loneliness. They include the "intensity and types of missing relationships, rationalization and defensiveness of the feelings of deprivation, time perspective, and perception of personal abilities to change the situation" (p.3). Also, Rönkä, Taanila, Rautio, and Sunnari (2018) demonstrated that the experience of loneliness has four dimensions including personal, relational, physical context, life event, and sociocultural.

Based on the multidimensional perspective of loneliness, this phenomenon has been classified in a variety of ways including emotional loneliness, social loneliness, self-related

loneliness (Chipuer, 2004; Jun, 2005; Masi, Chen, Hawkley, & Cacioppo, 2011; Stoliker & Lafreniere, 2015), chronic loneliness, situational loneliness, and transient loneliness (McWhirter, 1990). Integrating information on the multidimensional perspectives of loneliness revealed that different aspects of loneliness can be summarized in four different but interrelated categories (see Figure 4).

Figure 4: Multidimensional Model of Loneliness

This model aligns with Mikulincer and Segal's (1990) model in which emotional, self-related and social components of loneliness were inferred based on ten clusters of feelings of loneliness such as depressed mood, boredom, sense of estrangement, anger, and anxiety.

Based on the multidimensional perspectives, (Cacioppo et al., 2009; Praizendorf et al., 2019; Rönkä et al., 2018), loneliness is viewed as an afflictive and enduring state of bio-emotional, cognitive and social experience through which individuals display the following symptoms: Feeling distress for being ignored or rejected by others, feeling strange in an environment (Solomon, 2000), lacking proper partners for those desired activities that provide a sense of emotional intimacy (Russell, et al., 1980), having conflict between desired and actual

social contact (Wiseman & Guttfreund, 1995), and having dysfunctional thoughts about self (Chipuer, 2004). These characteristics may better distinguish loneliness from other *puzzling terms* such as aloneness, solitude, and lonesome or from other mental health difficulties (e.g., depression).

Puzzling terms: The term *aloneness* is one for which we do not have *a painful emotion* that is associated mainly with 'sadness and boredom' (Chipuer, 2004). Both sadness and boredom are reflected in individuals' expressions like "feeling unneeded, feeling left out, it feels like no one likes you" (Solomon, 2000 p. 161). Moreover, Galanaki (2004) emphasized that painful loneliness may or may not be rooted in 'aloneness'. Similar to attachment and opposite to loneliness, aloneness is also regarded as essential for human development (Buchholz etal., 1999). Winnicott (1957 as cited in Buchholz et al., 1999) argued that the capacity of 'being alone' provides an opportunity through which children, even infants "can discover [their] own personal [lives]" (p. 205).

Psychoanalytic views (such as Winnicott's) differentiated loneliness from aloneness. As well, existential perspectives describe two categories of loneliness including "loneliness anxiety" and "true loneliness" between which loneliness anxiety is different from aloneness (Moustakas, 1960 as cited in Buchholz et al., 1999 p. 205). Loneliness anxiety activates defense mechanisms that divert individuals from real life and reinforces the person for not having relationships with others. In contrast, true loneliness, which is parallel to aloneness, originates from the awareness that one is alone, which can be *a motive for creativity* (Buchholz & Catton, 1999). Also, according to existentialists, loneliness may be experienced as emptiness and alienation, with various correlated emotional symptoms such as shame or guilt (Nilsson, Lindstrom, & Naden, 2006).

Solitude is a positive term that refers to a self-selected situation in which individuals voluntarily choose to be alone without feelings of sadness or other distressing emotions (Galanaki, 2004; Stavros, 2015). In contrast to loneliness, solitude and being alone are effective in personality development and creativity (Galanaki, 2004). As it was mentioned before, loneliness is a negative agent that impairs executive functioning or self-regulation strategies in individuals (Cacioppo & Hawkley, 2009; Masi et al., 2011). Thus, it seems that solitude is more of a cognitive phenomenon rather than a social phenomenon in which volition is a determinant, (Galanaki, 2004). Teppersa, Luyckxa, Vanhalsta, Klimstra, and Goossens (2014) examined university students' attitude toward aloneness and solitude. In their study, three types of attitudinal reactions were found: a true affinity group, a true aversion group and an indifferent group. Comparing these three groups revealed that the first group (true affinity group) had greater self-esteem, less depressive symptoms, and lower loneliness. Most students in Teppersa et al.'s (2014) research had a positive view about aloneness and solitude. Another term that has been found in the literature is that of *being lonesome*. It is also noted that "being lonesome is a 'normal' and 'a transient state of mind' resulting from missing somebody specific, but loneliness is an overwhelming and persistent experience […] an 'inner worm' that gnaws at the heart" (Buchholz et al., 1999 p. 205). Additionally, when a person experiences loneliness, he or she may show the feelings of sadness, emptiness or being upset, depressed, hopeless, or confused (Buchholz et al., 1999; Chipuer, 2004). Those symptoms, which are rarely found in aloneness or solitude, characterize the nature of loneliness (Russell, McRae, Gomez, 2012; Smith & Victor, 2019) that may affect personal, social, and educational functions in students such as academic achievement (Bek, 2017; Nikmanesh, Kazemi, & Khosravi, 2015; Rosenstreich & Margalit, 2015).

2. Effects of loneliness on academic achievement

Loneliness has been studied in relation to depression and academic achievement. Weeks et al. (1980) found that not only depression and loneliness are highly correlated, they also have high co-variation in predicting students' academic achievement. Similar findings were reported by other recent studies (Benner, 2011; Del-Ben, Machado, Madisson, Resende, Vale´ Rio, & Troncon, 2013; Grimm, 2007). However, there are some differences in scholars' views about the directions of impact. For example, after one longitudinal study on 1,021 students from the University of Rzeszow (Poland), Grygiel et al. (2013) demonstrated that the direction of impact was from loneliness to depression not vice versa; that is, loneliness has stable unilateral impact on depression. This impact was viewed as a unique risk in middle-aged individuals. For example, Qualter et al. (2010) argued that loneliness has a pattern of sequential comorbidity with depression in youth and young adults. However, both loneliness and depression can affect individuals' different social and cognitive functions (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Public Health England, 2019).

Regarding students' cognitive functions, recent findings showed that loneliness can highly affect students' academic achievement (Quan et al., 2014). Likewise, such a relationship was found by Olmstead, Roberson, and Fincham (2016). Olmstead et al. (2016) examined 216 college students at three different times; first week, middle, and the last week of semester to find whether there is any relationship between psychological distress, loneliness, neuroticism, and academic adjustment. Through using path analysis (Structural Equation Modeling), they not only found significant correlation among all variables but also, they determined the mediating role for loneliness between psychological distress and academic adjustment. The important point of Olmstead et al.'s (2016) research was its short-term design that is usual in longitudinal studies.

Through this method, they demonstrated that the transition time to college is vital for students. Bek (2017) examined the relationship between loneliness and students' academic success in 213 international students at Usak university and demonstrated that there was a negative correlation between the sense of loneliness and students' course participation resulted lower academic achievement. However, Zarei et al. (2013) found that loneliness was an opportunity for gaining more progress in academic function.

Focusing on the nature of transition to university, Stoliker and Lafreniere (2015) demonstrated that some *post-transition events* such as social rejection or exclusion, economic problems, language barriers, different educational methods, and adjustment difficulties create loneliness and consequently learning problems in students. Their study reported low academic achievement for lonely students. However, some researchers postulated that loneliness may have a *mediating role* between such conditions and academic achievement (Mattanah, Brooks, Brand, Quimby, & Ayers, 2012). Mattanah et al. (2012) conducted a study on 170 students who were randomly assigned to two intervention and control groups consisting of 88 individuals (51.8%) for an intervention social support group, and 82 individuals (48.2%) who were assigned to the control group. After a 9-week social support group program and using regression equation to extract the mediational model for different factors, Mattanah et al. (2012) found that loneliness has a mediating role between social support and academic achievement. One of the important findings of Mattanah et al.'s (2012) research was that when loneliness was statistically controlled, the social support no longer predicted academic achievement. This method statistically reveals the mediating role of loneliness in academic achievement in multi-variable research. Andrade, (2006) in her research review reported that in most studies international students were more at risk of loneliness with low academic achievement.

Sawir et al. (2008) demonstrated that loneliness is one of the popular problems in international university students because of the loss of contact with their families and the loss of networks. These conditions by creating loneliness can affect students' academic experiences and achievement negatively (Sawir et al., 2008). Likewise, Rosenstreich and Margalit (2015) found that students with higher levels of loneliness showed more problems in academic achievement such as lower academic performance. Although Rosenstreich et al. (2015) demonstrated that the transition to university may enhance students' loneliness resulting the depletion of cognitive resources and then creating lower academic achievement, they did not find that loneliness had a mediating role in academic achievement or in the depletion of cognitive resources. Apart from mindfulness, Rosenstreich et al. (2015) did not specifically determine which of other cognitive resources such as self-regulation played a direct or indirect role in this relationship. However, it seems that there is a path between loneliness, self-regulation, and academic achievement.

Similar to Rosenstreich et al. (2015), this issue can be found to some extent in Nikmanesh, Kazemi, and Khosravi's (2015) research. Although they did not focus on academic achievement, they found that a sense of loneliness was negatively associated with students' cognitive functions such as cognitive regulation strategies.

Self-Regulation and Academic Achievement

The concept of self-regulation represents a distinctive feature of the human being, and perhaps is the most significant capacity for individuals that enables them to be capable of regulating their emotions and behaviors and to cope with situational events through different strategies (Zimmerman, 2000). This concept has been broadly utilized in different sciences such as physics (Gopinath, Hagan, Marchetti, & Baskaran, 2011) particularly similar to self-

organization (Ashby, 2000; Heylighen, 2008), economy (Williams, 2004), psychology (Bandura, 2006; Kanfer, 2005; Legault & Inzlicht, 2013), education (Cigdem, 2015), psychiatry and biology (Kelley, Wagner, & Heatherton, 2015; Watt, 2004). Focusing on the science of psychology and education, self-regulation will be explored through the following sections: 1) the nature of self-regulation in psychology and education and 2) its roles in relation to academic achievement.

1. The nature of self-regulation

In psychology and education, self-regulation represents a set of cognitive mechanisms or strategies such as appraising, reappraising, selecting, monitoring, directing, controlling, maintaining, delaying, and organizing behaviors that act *consciously* and *automatically* (Cigdem, 2015; Gestsdottir & Lerne, 2008; Kanfer, 2005; Kelley et al., 2015; Watt, 2004).

The terms conscious and automatic mechanisms crystalize some parts of self-regulation such as *intentional self-regulation* and *organismic self-regulation* (Gestsdottir & Lerne, 2008). The intentional self-regulation specifically determines a set of contextualized actions that are mainly aimed towards actively harmonizing demands and resources in the environment to achieve the goals by better functioning (Gestsdottir et al., 2008). According to Gestsdottir et al. (2008), intentional self-regulation can be exemplified by a situation in which a student starts a negotiation with his or her professors from one side and other responsible agents from other side to harmonize their demands and resources to reach her/his goals such as doing a project. Organismic self-regulation refers to all biological, physiological, and cognitive processes that contribute to individuals' relationships with environment.

However, in the science of psychology, self-regulation particularly refers to a human active and constructive ability to manage personal emotions, thoughts, feelings, and wishes as well as activities to achieve desired outcomes and fulfil a variety of individual needs (Carey, Neal, & Collins, 2004; Corsini, 1999; Trommsdorff, 2009). Likewise, Zimmerman (2000, as cited in Sandars & Cleary, 2011) defined self-regulation as "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (p. 14).

Self-regulation as a unique human capacity is *complex and universally developmental* (Trommsdorff, 2009), consists of several ordered stages, utilizes *causal cognitive processes* or *strategies* (Farley & Kim-Spoon, 2014; Garnefski et al., 2007; Jermann, Linden, d'Acremont, & Zermatten, 2006), and acts as mediators between self-system and social system to reach goals (Garnefski et al., 2007; Trommsdorff, 2009). These characteristics are discussed in the following.

A. Complexity and universality of self-regulation

The complexity and universality of self-regulation refers to different emotional and cognitive developmental stages through which this capacity is developed in humans (Shahidi, 2015a, b; Vallotton, & Ayoub, 2011). There is a common sense among scholars indicating that this human capacity is constructed within different stages of life-span development through involving biological, emotional, cognitive, and linguistic domains (Montirosso, Cozzi, Tronick, & Borgatti, 2012; Stark, Sander, Yancy, Bronil, & Hoke, 2000; Trommsdorff, 2009; Vallotton & Ayoub, 2011).

From infancy to early childhood: It was demonstrated that during *infancy* when arousal levels are maintained relatively low (by caregiver's help), infants become able to modify their

own mood and emotions using *reflex behaviors* such as eye closing and sucking (Kopp, 1989 as cited in Stark et al., 2000). Subsequent to biological (physical) development in late infancy and in the first months of early childhood, children become able to use hands and body, as primary symbols, to explore the world and to construct their self-regulation (Vallotton, 2008). Although children's body language is shaped through observing parents' objective behaviors, the body gestures and face to face interactions contain most components that are central for constructing children's self-regulation (Montirosso et al., 2012; Vallotton, 2008). *Pointing, showing, requesting, stopping, rejecting, and ignoring* are just some of the components of children's gestures that are embedded in the body formation of self-regulation (Montirosso et al., 2012).

Based on an empirical observation, Vallotton (2008) demonstrated that children's usage of body signs determines their intentionality of *waiting – thinking –* and then *regulating* their behavior towards the goal. In this period of life, human talks with children contain a set of components such as direction, inhibition, control, appraisals, a sense of ability, and recognition by which children will learn how to regulate their behaviors contextually. To learn these components, language is great help.

From early to late childhood: In this period, language becomes a main tool for emotional regulation (Håkansson, 2010; Santrock, Mackenzie, Leung, & Malcomson, 2005; Weiner, 2012). Language helps children to develop their *cognitive representational skills*. These skills are also main tools for children to appreciate the origins of emotions, and to verbalize and control their desires (Stark et al., 2000). Scrutinizing the children's spoken language (e.g., "I don't need", "I want that", "I do it by myself", "Me too"), and also the study of representational skills through imagination and inner language revealed that '*self*' and its major components (e.g., self-regulation, self-concept, and others) are gradually being formed in late childhood.

These components become more obvious at the beginning of school by which children learn a set of regulation strategies that help them to regulate their emotions and desires. Thompson (1991 as cited in Stark et al., 2000) believed that such strategies include "thinking happy thoughts, redirecting attention, focusing on the benefits of regulation, and recalling earlier emotional experiences" (p. 177). The following talks are the examples of the above noted components that can be found in Vallotton's (2008, p. 30) research emphasizing that the mechanism of internalization through language facilitates the development of self-regulation contextually: "Let's finish this puzzle first before you play" (that is the process of inhibition-control and order or regulation). "Yes, this is a hard one, but you can do it if you try again" (this represents the process of reinforcement-order). "The piece didn't fit there; where will you try it next? (this also represents the process of awareness-order and ability). "Puzzle first, no play," "Try again," "Not there; where next?" (this shows the process of inhibition-order or regulation, control). These examples demonstrated the role of language in constructing self-regulation.

The roles of language and the interaction between social context and mental processes in developing self-regulation was implicitly emphasized by Vygotsky (1967, Bodrova, 2014; Bramucci, 2013; Florez, 2011). Although Vygotsky did not use the term "self-regulation" to describe higher mental processes (Bodrova, 2014), he emphasized that children use the process of internalization through language to develop their behaviors from *co-regulating* behavior with an adult to *behaving independently*. This development occurs within the *zone of proximal development* (ZPD), which is the growing edge of competence representing a set of skills a child needs to learn (Florez, 2011).

To reach at this level of development, children use inner language which is very self-directed speech such as the above-noted statements. This self-directed dialogue is either *task-*

involved or *self-involved* (Bramucci, 2013). Through task-involved speech, children use problem-solving strategies to increase their control over the external events or performance. As an example, a 5-year child, Melissa, talk to Lucy: "Tricia's been doing this a lot; why don't you ask her how to do it? I bet she could show you." This skill is what researchers currently determine as one of the self-regulation strategies or processes (Carver, Johnson, & Joormann, 2009; Legault & Inzlicht, 2013; Trommsdorff, 2009). Thus, according to Vygotsky, children acquire these skills through passing some stages from *other-regulated stage*, to *self-talk stage* and from self-talk to *regulating and leading activity independently* (Bodrova, 2014). All these stages occur from early childhood to late childhood. The important point in Vygotsky's theory is that external regulators such as timers, schedules, and adults' behaviors promote self-regulation (DeVries, 2000).

From adolescence to early adulthood: Passing childhood and entering early and middle adolescence period (aged from 10 to 18 years old), the behavioral signs of *identity formation* show that some of self-regulation strategies such as appraisal and reappraisal abilities gradually improves (Santrock et al., 2005). In this improvement, biological factors such as the maturation in some brain areas (e.g., prefrontal cortex) has main role (Santrock et al., 2005). However, when *reappraisal ability* was examined as an index for self-regulation in adolescents and young adults, some studies revealed that this development has different patterns including linear and non-linear patterns in adolescents and young adults (McRae, Gross, Weber, Robertson, Sokol-Hessner, Ray, Gabrieli, & Ochsner, 2012). Ochsner and Gross (2008) defined this major index (reappraisal) as a complex cognitive regulatory strategy by which individuals maintain their goals to reappraise in working memory, generate alternative appraisals, predict potential outcomes of the emotional

situation, select an appropriate plan, and monitor the degree of success in changing affective state.

Supposing this ability depends on the brain development, McRae et al. (2012) hypothesized whether there is a *linear* or *nonlinear* pattern of activation with age in brain regions associated with social cognitive processes. These regions were medial prefrontal cortex, posterior cingulate cortex, and anterior temporal cortex. McRae et al. (2012) provided thirty-eight participants (aged from 10 to 22) with a task hypothesized to distinguish negative emotional reactivity from reappraisal ability (self-regulation). They found that there is "a strong linear increase in cognitive reappraisal ability with age, which was accompanied by linear increases in the activation of a region of the left ventrolateral prefrontal cortex" (p. 17). This association was previously assumed to occur in adults (Ochsner & Gross, 2008). McRae et al.'s (2012) study revealed that self-regulation with brain-based development gradually improves from early adolescence (aged from 10 to 13 years old) to late adolescence (aged from 18 to 22 years old), and then this capacity is extended in young adults (aged 22 to 28 years old).

However, the period of adolescence is not completely similar to early adulthood during which self-regulation seems to be mainly constructed. The reason for this is related to some characteristics such as enhanced emotional instability, change in arousal regulation, appetite changes, increased risk, and sensation seeking that is caused by brain development (Kutcher, 2012). Generally, the brain development during adolescence includes three intersecting processes including *proliferation,* which refers to rapid growth of brain matter and shaping new synaptic connections, *pruning,* which refers to reducing unused synaptic connections, and *myelination*, which refers to neurons' insulating for faster neural transmission (Kutcher, 2014). These processes also generate an increased *prefrontal system activity,* which involves superior planning

and behavioral flexibility, (Kelley et al., 2015; Watt, 2004). As well, the process was held to provide a linear increase in the brain's white matter and non-linear decrease in gray matter (Blakemore & Choudhury, 2006), and procreates dopaminergic systems (Kutcher, 2012; Luciana, Wahlstrom, Porter, & Collins, 2012; Sulzer et al., 2013). All these changes provide adolescents and young adults with an appropriate background through which self-regulation gradually develops.

Cognitive theorists believed that during *late adolescence* and the *young adult stage* these neurological changes are associated with coordinating behavior and thoughts, selective attention, what constitutes appropriate decision-making, voluntary response inhibition, and working memory, which all considered as the cognitive processes of self-regulation or as executive functions (Blakemore et al., 2006; Kelley et al., 2015).

What is important in this period of life is the development of cognitive processes (e.g., self-delay, self-inhibition, self-monitoring, self-appraising, decision making, self-autonomy and others) in adolescents (aged 18 to 22) and young adults (aged 22 to 30) for self-regulation (Santrock et al., 2005). Although these cognitive processes were frequently studied and mentioned by scholars (Bandura, 2006, 1991; Carey et al., 2004; Zimmerman, 2013), such causal cognitive processes or strategies of self-regulation varied from one theory to another theory.

B. Causal cognitive processes/strategies in self-regulation

There are different views about the processes of self-regulation. Based on Bandura's theory these processes consist of self-observation or behavioral monitoring, self-evaluation of progress or self-judgment, and self-reaction (Bandura, 1986 as cited in Miller & Brickman, 2004). Other opinions were either focused on the components of self-regulation (Carver et al., 2009;

Trommsdorff, 2009) or the stages through which self-regulation functions (Miller & Brown, 1991). For example, Trommsdorff (2009) argued that self-regulation has some major components or strategies such as appraisal and reappraisal, expression, experience, and behavioral intention. Also, based on Frederick Kanfer's (1970) works on self-regulation, Miller and Brown (1991) formulated a seven-stage model through which self-regulation functions. The stages include receiving relevant information, evaluating the information, and comparing it to norms, triggering change, searching for options, formulating a plan, implementing the plan, and assessing the plan's effectiveness (which recycles to steps 1 and 2). These functions are similar to what Bandura (2006) argued as self-observation, self-evaluation, and self-reaction as the functions of self-regulation.

The following example shows a concrete and objective picture of some of these processes: Suppose a student is passing the university's main hall to go to the library and makes herself ready for tomorrow's final exam in physics (self-awareness). She sees her friends in the hall who are leaving the university to have a night party, and she has to restrain her urge to accept their kind invitation (inhibition). She re-directs her attention away from the tempting invitation (executive attention or attentional management), and she speaks to herself using her mind's voice (inner-language with verbal self-instruction or working memory). Then, she visualizes an image of her goal and what she will feel when she successfully passes the exam (nonverbal working memory or visual imagery). She may find herself thinking about various ways by which she could have managed her time effectively with similar temptations (problem-solving), and meanwhile she may use her own words to encourage herself to achieve the goal (self-motivation). Aligned with Legault's and Inzlicht's (2013) discourse of self-regulation, this example reveals that self-regulation involved in some causal cognitive processes through which

people control and restrain their emotions and automatic impulses to facilitate attaining goals such as academic achievement or health related goals.

Although such cognitive processes can characterize self-regulation, these processes were also argued to be the underpinning components of another human's mental capacity named *executive function* (Baumeister, Schmeichel, & Vohs, 2007; Chan, Shum, Toulopoulou, & Chen, 2008). Hence, a question is posed whether these constructs (self-regulation and executive functions) are different, or both can be used interchangeably. Two distinguished perspectives can be recognized in contemporary studies (Barkley, 2012; Janssen, De Mey, & Egger, 2009; Tal-Saban, Ornoy, & Parush, 2014). Based on one perspective, these constructs have similar underlying cognitive processes such as appraising, monitoring, directing, controlling, self-awareness, use of working memory, maintaining, delaying, and organizing behaviors; thus, they can be used interchangeably (Gendolla, Tops, & Koole, 2015). Barkley (2012) argued that each executive function can be recognized as to be a typical of self-regulation.

In contrast, other researchers argued that there may be confusion or misunderstanding of conceptual versus empirical explanation of both self-regulation and executive functions, particularly when different theories are used for conceptualization (Martin & McLellan, 2008). For example, Martin et al. (2008) argued that those researchers who follow cognitive neuroscientific frameworks tend to connect executive functions to neural control processes operating in the prefrontal cortex. Thus, contrary to self-regulation, the concept of executive function is more referred to brain functions such as the function of the *cerebellum* and *frontal cortex* when the motor coordination and executive functions were examined in individuals with Developmental Coordination Disorder (Tal-Saban, Ornoy, & Parush, 2014).

This perspective also tends to divide executive functions into two *cold and hot* sets of components (Chan et al., 2008). *Hot components* refer to those components that involve more emotional or desire-related strategies such as decision-making and emotional interpretation. *Cold category* refers to just cognitive processes that are more mechanistic and logical such as appraisal (Chan et al., 2008).

Based on the interchangeability view, the term *cognitive emotion regulation* (Garnefski, Legerstee, Kraaij, Van Den Kommer, & Teerds, 2002; Garnefski, Grol, Kraaij, & Hamming, 2008) will be used in this thesis research. This term not only indicates the biological and brain-related structures or factors in constructing self-regulation (Barkley, 2012; Kelley et al., 2015), but also both cognitive and emotional components (strategies) are considered as the underpinning layers of self-regulation (Garnefski & Kraaij, 2007, 2008; Gendolla et al., 2015; Kraaij & Garnefski, 2019). These components include the ability to appraise, reappraise and choose their own choices from alternatives; develop a plan by regulating their behaviors; monitor their progress; restrain their desires, drives, emotions and tempting thoughts or impulses; and, maintain their activities to gain their goals (Baumeister et al., 2007; Chan et al., 2008; Garnefski et al., 2007, 2008; Tal-Saban et al., 2014).

A more specific description of self-regulation strategies or processes, which is used in this research proposal, is Garnefski et al.'s (2002) classification of such strategies (Garnefski et al., 2008; Kraaij & Garnefski, 2019; Wolkenstein, Zwick, Hautzinger, & Joormann, 2014). According to them, these strategies are divided into *adaptive* and *maladaptive* strategies. Maladaptive cognitive strategies include rumination, self-blaming, catastrophizing, and other-blame. Adaptive regulation strategies consist of acceptance, positive reappraisal, positive

refocusing, refocus on planning, and putting into perspective (Garnefski et al., 2007; Marroquin, & Nolen-Hoeksema, 2015).

To the extent the adaptive processes or strategies are performed appropriately within the system of self-regulation, individuals can regulate their goal-directed behaviors such as learning or academic achievement, health-directed goals, and work-based behaviors. According to Kelley et al. (2015), to perform appropriately, the self-regulation system should cover the following criteria: 1) It must be conscious; that is, it relies on volitional and ongoing attempts to regulate behaviors. 2) It should understand time that is, in contrast to following immediate rewards, it should be capable of long-term goal planning and should regulate emotions and desires to reach long-term goals. 3) It should be configurable; that is, it should reappraise the alternative plans and be capable of interchanging and updating the goal parameters as situations dictate. 4) It should be anatomically positioned to interact with both internal processing and external systems. Generally, self-regulation may have different effects on students' academic achievement as it was discussed in the following.

2. Direct and indirect impacts of self-regulation on academic achievement

Exploring the role of above-noted strategies in different psychological domains revealed that some researchers indicate the direct effects of self-regulation on academic achievement (Blair & Diamond, 2008). Reporting Blair and Diamond's (2008) findings, Farley and Kim-Spoon (2014) reviewed 70 empirical studies and demonstrated that highly developed levels of self-regulation not only are associated with good academic outcomes, but also with low levels of substance use in adolescents and young adults; that is, they could regulate and manage their goal-directed behaviors and control their immediate emotional desires.

It was also demonstrated that college and university students who had a high level of adaptive self-regulation strategies were more successful in their academic adjustments and academic performance by showing learning behaviors to acquire high GPA (Legault et al., 2013; Liao et al., 2012; Sandars & Cleary, 2011). Specifically, Sandars and Cleary (2011) demonstrated that students who were highly self-regulated learners showed some characteristics including having goal-directed behavior, using specific strategies to gain their goals, and modifying and adapting their strategies to optimize learning (academic achievement).

In addition to direct role of self-regulation, some researchers emphasized that since there are many factors influencing academic success such as peer support, critical thinking, time management, depression, and anxiety (Kim et al., 2015), the direct roles of self-regulation strategies should be explained cautiously (Farley & Kim-Spoon, 2014; Kim et al., 2015). This cautiousness led the researchers to focus on the mediating roles of self-regulation in academic achievement, academic adjustment (Duru, Duru, & Balkis, 2014; Quan et al., 2014), and in depression and loneliness (Swami, Chamorro-Premuzic, Sinniah, Maniam, Kannan, Stanistreet, & Furnham, 2007).

Such roles became prominent when self-regulation had been studied in relation to other influential variables that had strong effect size in predicting academic achievement. However, that is not very surprising since self-regulation was held to have a mediating role between *self-system* and *social system* (Bandura, 1969 as cited in Carvone et al., 2009). According to Bandura (1969 as cited in Carvone et al., 2009), self-regulation mediates between the processes of internal and external influences. In this mediation, people are more proactive than reactive.

Duru et al. (2014) studied burnout, academic achievement, and self-regulation on 383 undergraduates with different majors. Using GPA as an index for academic achievement, Duru et al. (2014) showed that when self-regulation was studied along with other variables (e.g., emotional exhaustion and cynicism) through the use of Structural Equation Modeling (SEM) self-regulation mediated the relationships between emotional exhaustion, cynicism, reduced academic efficacy, and academic achievement. In other words, one of these mediating roles was the fact that although emotional exhaustion had low effect size on academic achievement separately, this effect size became proliferated when self-regulation accompanied with emotional exhaustion (Duru et al., 2014).

In order to explore this mediating role of self-regulation, some studies have been focused on a very narrow form of self-regulation in students named *self-regulated learning*, which refers to the students' volitional use of metacognition strategies to take charge of their own learning (Turingan & Yang, 2009). Although this form of self-regulation does not embrace all the above-noted processes of self-regulation, it refers to very oriented and constructive strategies through which learners take control of their ways of learning to succeed (Bramucci, 2013; Kaplan, 2008).

Nevertheless, in such studies, the direct and indirect (mediating) roles of self-regulated learning on academic achievement were corroborated (Los, 2014; Taura, Abdullah, Roslan, & Omar, 2014). Using a path analysis through SEM and after examining 261 university students, Barzegar, (2012), demonstrated that self-regulated learning strategies (e.g., metacognitive, deep cognitive, surface cognitive and resource management strategies) have mediating roles in the relationship between goal orientation and academic achievement. Similar to Barzegar's findings, but different to his area of study, Barnard, Paton, and Lan (2008) demonstrated that although self-regulated learning behaviors did not have very close association with academic achievement,

such behaviors had a positive mediating role between student perceptions of online course communication (collaboration) and academic achievement. Through the use of structural equation modeling, this mediating role was significant; that is, students' self-regulation in online learning is positively mediating the relationship between students' perceptions of online course communication and achievement as measured by GPA (Barnard et al., 2008).

Both Barzegar's (2012) and Barnard et al.'s (2008) studies focused on self-regulated learning in a very similar explanation in which self-regulated learning referred to students' self-generated thoughts and behaviors that methodically oriented towards achieving learning goals (Zimmerman & Schunk, 2001as cited in Barnard et al., 2008).

In addition to the above noted studies, Taura et al. (2014) used Structural Equation Modelling (SEM) to explore different direct and indirect (mediating) roles of some variables in which self-regulation and self-efficacy were central. Regardless of academic achievement, Taura et al. (2014) conducted a study on 426 college students and demonstrated that self-regulation had a significant mediating role in the relationship between self-efficacy, task value, and active procrastination. The mediating role of self-regulation was studied in other areas such as students' psychological well-being and psychological distress (García-Villamisar & Armentia, 2014; Hofer, Busch, & Kartner, 2011). Such studies revealed the prominent mediating role of self-regulation.

However, regarding the direct or indirect roles of self-regulation in academic achievement or psychological problems (e.g., depression), the type and the number of variables, and the type of analysis (e.g., statistical analysis through SEM) in a study may generate different results. For example, characterizing blended learning as key features of face to face and online

instructional methods, Cigdem (2015) examined 267 military vocational college students with blended learning experiences at Computer Programming Course. Cigdem (2015) studied the relationship between perceived anxiety, interactivity in the online learning environment, perceived self-efficacy, self-regulation, and students' achievement in blended courses. He did not find a significant relationship between learner self-regulation and achievement in blended computer programming course.

Likewise, Cetin (2015) in his study on 166 university students demonstrated that there was no significant association between academic motivation, academic self-regulated learning, and university students' GPAs; that is, these two factors (academic motivation and self-regulated learning) could not predict academic achievement (GPA). This result might have been generated by his sampling method or the influences of confounding variables. Also, his scale to measure self-regulation could only cover a few possible components of self-regulation such as memory strategy, goal setting, seeking assistance, environmental structuring, and learning responsibility.

The direct and mediating roles of self-regulation in multivariate studies, in which academic performance was a dependent (criterion) variable, have still been controversial (Los, 2014; Taura et al., 2014). Some of these studies were focused on some demographic or cultural differences in students that affect their self-regulation and consequently their academic achievement (Hamamura & Heine, 2006; Turingan & Yang, 2009). Trommsdorff (2009) claimed that the development of self-regulation is embedded in a cultural context generating different models of agency such as self-regulatory efforts that are directed towards individualistic goals rather than towards group goals. Focusing on the differences between individualistic and collectivistic cultural values, Hamamura et al. (2006) argued that self-regulation is shaped differently in terms of cultural values. Based on his PhD thesis research, Hamamura (2008)

argued that in individualistic societies (e.g., North America), being autonomous, having clear boundary between self and others, and preferring personal goals instead of group goals are encouraged. Consequently, some of the major components of self-regulation and goal selection can be affected by cultural values. In contrast, in collectivistic societies (e.g., societies in East Asia) individuals are held to be deeply united in their social networks in which group goals are preferred.

In this regard, some researchers focused on the process of control, as a major process of self-regulation, and argued that when students' self-regulation was compared cross culturally, Asian students were more dependent on their instructors and more reliant on external sources of control than American students who were reliant on internal sources of control motivating them to initiate self-regulated learning (Tanaka-Matsumi & Marsella, 1976 as cited in Turingan et al., 2009).

Turingan et al. (2009) also compared self-regulation skills in 185 Korean and 209 Filipino college students. These skills included 1) cognitive skills such as rehearsal, elaboration, and organization, 2) metacognitive self-regulation composed of planning, monitoring, and regulating skills, and 3) resource management skills that included environmental management, effort management, and help seeking. He found that Filipino college students have higher self-regulated learning skills in all above categories than Korean college students. Turingan et al. (2009) concluded that social expectations, values and beliefs towards higher education, and respect for authority were assumed to be the main factors for this result. However, the specific roles of these factors were not investigated in Turingan et al.'s. (2009) study as well as Trommsdorff's (2009) study.

As such, researchers, who focused on cultural differences and self-regulation, tended to conduct comparative studies instead of predictive or multifactor relational studies. Thus, the different roles of self-regulation were not usually studied in such cultural research. Additionally, based on the aforementioned evidence-based discourse, it is possible that different environmental, situational, and emotional experiences in host universities (e.g., experience of lack of friends, loneliness, or depression) create such differences in international students' self-regulation as well as their academic achievement. For example, it was demonstrated that geographic relocation predicted loneliness in first year university students (Shaver et al., 1985 as cited in Cacioppo et al., 2009) that had negative educational impacts.

Generally, focusing on the specific roles of self-regulation in relation to psychological problems (García-Villamisar et al., 2014; Hofer et al., 2011) and academic achievement (Barnard et al., 2008; Los, 2014; Quan et al., 2014; Taura et al., 2014), it is assumed that self-regulation may have different direct or mediating roles. However, such roles may be different in terms of the mediating roles of depression, loneliness, and academic achievement amongst international and domestic students. Since these types of roles can be assumed for each of other factors (loneliness and depression), different hypothetical models should be assumed through structural equation modeling (SEM). Prior to assuming such models by SEM, the literature about the inter-relational paths among depression, loneliness, self-regulation, and academic achievement should be reviewed.

Inter-Relational Paths

A search of the literature on the inter-relationships among depression, loneliness, self-regulation, and academic achievement was reviewed. Although many academic studies were found in relation to just academic achievement or with one or two of other variables, no research article, or other resources in which all these variables had been studied conjointly was found. A few studies, which involved path analysis, were found in relation to the above noted variables separately. The literature about interrelationships among the contributing factors was also reviewed as follows.

1. Depression, Loneliness, and Academic Achievement

Two broad view have been recognized through a literature review regarding how depression and loneliness are related to each other. Some scholars argued that these are different phenomena naturally; however, there is some association between them. For example, Dell, Pelham, and Murphy (2019) argued that emotional loneliness had greater association with depression. Chang (2018) demonstrated that only high levels of loneliness had association with depression; although, gender mediated this association and resulted in lower association in male samples. Such associations were corroborated by others (Cacioppo & Cacioppo, 2018; Layden, Cacioppo, & Cacioppo, 2018; Teo et al., 2018).

Cacioppo et al. (2006) and Cacioppo et al (2009) conducted a factor analysis to show the degree to which loneliness and depression are different form each other. In their research, 2628 university students were examined using the R-UCLA Loneliness Scale, the MMPI Lie Scale, and Beck Depression Inventory (BDI). After mixing all the scales' items and conducting a principal axis factor analysis with oblique rotation (Promax with Kaiser Normalization), they

have found four factors that were certainly distinguishable based on the scale sources. Their research revealed that R-UCLA and BDI have been recognizing two different phenomena. The degree of correlation between all factors and two scales also revealed that they are naturally different from each other. Before Cacioppo et al.'s (2006) study, Wiseman and Guttfreund (1995) had studied the relationship between depression and loneliness and had found that these are two clearly separate phenomena among university counselling-seekers. This view did not reject the correlations between depression and loneliness; however, it supposed that they are naturally different. Thus, each of them may have different direct or mediating effects on academic achievement.

There are also some studies that did not focus on the conceptual uniqueness of loneliness and demonstrated that social isolation (Maystona, Frissab, Tekolab, Hanlonb, Princeb, & Fekaduc, 2020), loneliness, and depression have very common features forming a close association (Jaremka, Fagundes, Glaser, Bennett, Malarkey, & Kiecolt-Glaser, 2013; Maystona et al., 2020; Wiseman, Mayseless, & Sharabany, 2006). This view is based on different empirical studies such as research on the common genetic markers between loneliness and depression (Matthews, Danese, Wertz, Odgers, Ambler, Moffitt, & Arseneault, 2016; Tsai et al., 2012; Van Roekel et al., 2010), the predictive role of loneliness in depression (Qualter, Brown, Munn, & Rotenberg, 2010), common causes and predispositions (Fried et al., 2015; Wiseman et al., 2006), and common biological and neurological bases (Gressier, Calati, & Serretti, 2016; Leon, 2008; Spithoven et al., 2015; Van Roekel et al., 2010). These studies were mostly done with either clinical populations or with individuals such as university students.

Utilizing a twin study design, Matthews et al. (2016) studied 1,116 same-sex twin pairs born in England and Wales to find whether they have common genetic features in loneliness,

depression, and social isolation. The participants in Matthews et al (2016) study were members of the Environmental Risk (E-Risk) Longitudinal Twin Study in England. The longitudinal twin study was focused on the development of a birth cohort of 2,232 British individuals. Selecting those participants, the study was focused on comparing the similarity of monozygotic (MZ) twin pairs versus dizygotic (DZ) pairs, the influences of additive genetic (A), shared environment (C) and non-shared environment (E). Through the use of a regression method and the structural equation modeling (SEM), Matthews et al. (2016) found that there was a significant genetic correlation (.63, $p < .000$) between loneliness and depression displaying a fundamental role of genetic influences in the co-existence of these phenotypes.

Regarding the biological bases for both depression and loneliness, it was demonstrated that 5-HTTLPR genotype (a functional polymorphism in the promoter region of the serotonin transporter gene) has a main role in causing loneliness and depression (Leon, 2008; Spithoven et al., 2015; Van Roekel et al., 2010). Recently this role was replicated empirically for depressive symptoms and other affective disorders (Gressier et al., 2016).

Also, it was argued that the reduced dopamine, as a main neurotransmitter, can strongly produce loneliness (Cacioppo, Hawkley, Norman, & Berntson, 2011; Cacioppo et al., 2006). The same role was frequently reported for depression (Beck, 1967 as cited in Brage et al., 1993; Dunlop & Nemeroff, 2007; Sadock & Sadock, 2003, 2015). In the same area, physiological effects, Cacioppo et al. (2009) have found that both loneliness and depression can have similar neuroendocrine functions. However, loneliness can predict depression in this view (Cacioppo et al., 2009).

The simultaneous occurrence of both loneliness and depression in college and university students has been studied by many scholars (Hunley, 2010; Stickley & Koyanagi, 2016; Swami et al., 2007) with the results supporting common causes and predispositions of loneliness and depression. Regarding international students, Hunley (2010) demonstrated that loneliness had close association with psychological problems such as depression. She also found that the high levels of loneliness and psychological distress affected students' academic performance negatively. Diehl, Jansen, Ishchanova, and Hilger-Kolb (2018) examined loneliness and depression in 689 students in Germany and reported that both are correlated with each other. While other affective or social factors (e.g., life satisfaction and health) were studied together in university students through structural equation modeling, loneliness played a more mediating role (Swami et al., 2007).

Thus, there was not only an association between loneliness and depression in university students, but also this association was corroborated in both psychiatric and large general groups (Jaremka et al., 2013; Stickley & Koyanagi, 2016). Stickley and Koyanagi (2016) argued that loneliness has close association with moderate depressive symptoms such as the loss of interest, hopelessness, or social isolation (withdrawal), and with severe depressive symptoms such as suicidal ideation and suicide attempts. Generally, it was argued that not only were loneliness and mental health negatively related to each other (Bhagchandani, 2017; Shahidi, 2013), but also it was argued through replicated studies that both depression and loneliness are associated with each other and consequently they can reduce student's overall functioning (Hunley, 2010), academic achievement (Rosenstreich et al., 2015), and academic adjustment (Olmstead, 2016). As well, the literature on self-regulation strategies in relation to depression and academic achievement helped to understand how these factors may related to each other.

2. Depression, Self-Regulation, and Academic Achievement

Emotional experiences usually are characterized by some central features including levels, intensity, valence, duration, complexity, action tendency, and emotional regulation (Hofmann, 2014). Emotional regulation is considered central to many studies (Garnefski et al., 2007; Jermann et al., 2006; Kraaij & Garnefski, 2019; Marroquin et al., 2015). This feature refers to the extent to which emotions can be controlled by individuals' higher cognitive processes or strategies such as acceptance, positive reappraisal, positive refocusing, refocus on planning, and gaining perspective (Garnefski et al., 2007; Kraaij et al., 2019) as well as monitoring, evaluating, modifying reactions (Mauas, Kopala-Sibley, & Zuroff, 2014). It has been theorized that when emotional regulation (controllability of mood and emotion) fails, individuals will face some mood or emotional difficulties such as depression (Stark et al., 2000; Kendall, 2000).

An extensive body of research has demonstrated that difficulties in regulating mood and emotions have a central role to play not only in the symptomatology, but also in the etiology of mood disorders, particularly in depressive experiences (Dobson, 2010; Ghorbani, Watson, Farhadi, & Chen, 2014; Loey, Oggel, Goemanne, Braem, Vanbrabant, & Geenen, 2014).

Such difficulties in regulating emotions have been also recognized as *self-regulation failure* (Kelley, Wagner, & Heatherton, 2015; Legault, & Inzlicht, 2013) that emerge through using either maladaptive self-regulation strategies such as rumination, self-blaming, catastrophizing (Mauas et al., 2014; Marroquin et al., 2015) or lower levels of [adaptive] self-regulation processes such as appraisal, acceptance, and positive refocusing (Bruyneel, & Dewitte, 2012; Loey et al., 2014). Both forms of self-regulation failure are reflected in behavior, affect, and cognitive activities (Mauas et al., 2014). For example, individuals become unable to

stay on task or meet their goals, they have difficulties in modulating negative emotions (affect), and they show low cognitive functions affecting their different performances such as academic achievement. Also, to conceptualize the relationship between depression and self-regulation, researchers focused on both adaptive and maladaptive self-regulation strategies (Jermann et al., 2006; Loey et al., 2014; Marroquin et al., 2015; Min, Yu, Lee, & Chae, 2013).

Maladaptive (negative) self-regulation strategies or processes such as rumination, self-blaming, catastrophizing, and blaming others have been studied extensively in relation to depression (Kraaij & Garnefski, 2019; Wolkenstein at el., 2014). Garnefski et al (2002, 2019) demonstrated that rumination, self-blame, and catastrophizing as maladaptive self-regulation can predict depression. Also, positive reappraisal as an adaptive component of self-regulation has negatively significant effect size in this prediction. Approximately, the same results were found in five groups of samples including early and late adolescents, adult general population, the elderly, and psychiatric patients (Garnfeski & Kraaij, 2006).

Adaptive (positive) self-regulation strategies such as self-awareness, acceptance, positive refocusing, positive reappraisal, monitoring, and putting in perspective giving were also studied in relation to mood disorders (Loey et al., 2014; Min et al., 2013; Wolkenstein et al., 2014). Although there are some nuances between the findings of such studies, through an integrative view, most studies revealed that negative or maladaptive self-regulation strategies were associated with depression and other mood disorders such as bipolar disorder (Wolkenstein et al., 2014).

In one study, Garnefski and Kraaij, (2018) used Cognitive and Emotion Regulation Questionnaire (CERQ) and Symptom Check List (SCL-90) on 582 secondary school students

and demonstrated that rumination and self-blame, as two components of CERQ, had positive correlation with symptoms of depression. Also, positive reappraisal, and positive refocusing were negatively associated with depression (Garnefski et al., 2018). Using Beck Depression Inventory II (BDI-II), and Cognitive Emotion Regulation Questionnaire (CERQ), Jermann et al (2006) conducted a study on 224 young adults to determine which self-regulation strategies were used more frequently in individuals with depression. They found that self-blame and rumination are two key maladaptive cognitive regulation strategies that have a high effect size in predicting depressive symptoms.

Self-blame refers to thoughts of blaming oneself for what he or she has experienced such as faults or misdeeds, and rumination is related to obsessive concern or negative recurrent thinking about the feelings and thoughts associated with negative events (Min et al., 2013; Corsini, 1999). Loey et al. (2014) conducted a longitudinal study on patients with burns to investigate which type of self-regulation processes were involved in depressive symptoms. They found that patients with depressive symptoms used lower levels of positive refocusing and higher levels of rumination. Focusing on the mediating role of *over general autobiographical memory (OGM)* between rumination and depression, Kong et al. (2015) also found that rumination, as a key maladaptive or negative self-regulation, had an association with depressive symptoms.

Similar to Loey et al (2014) and Kong et a. (2015) findings, but with different type of participants, Ghorbani et al. (2014) studied 1,162 Iranian university students to find whether their self-regulation is associated with depression, perceived stress, and/or anxiety. Ghorbani et al (2014) found that students' self-regulation was negatively associated with their depression.

Based on a view in which self-regulation is a main factor in the consistent flow of mental health, Min et al. (2013) focused on the role of self-regulation in both resilience and depression. After examining 230 outpatients with depression, they demonstrated that the greater use of adaptive (positive) self-regulation strategies, the more resilience capacity. Their research also displayed that refocus on planning, positive reappraisal, and less use of rumination also could predict high levels of resilience. In contrast, rumination, catastrophizing, self-blaming, and blaming other were strongly associated with depression and anxiety. Of these maladaptive self-regulation strategies, rumination was a key predictor of depression.

Wolkenstein et al. (2014) compared three groups of examinees (bipolar group, those with major depressive disorder (MDD), and a health control group) to test the role of emotional regulation deficits (failure) in generating the disorders. Wolkenstein et al. (2014) found that both bipolar patients and patients with MDD used more maladaptive self-regulation strategies such as self-blaming, catastrophizing, and rumination than positive self-regulation processes such as positive reappraisal. Turashvili and Japaridze (2012) demonstrated that university students who did not have depression, had high indicators on scales of task-oriented coping and emotional coping. Hence, it was inferred that both depression and self-regulation failure can affect students' academic achievement negatively.

In addition to the association among depression, self-regulation and academic achievement, the direction of their effects on each other is vital to be explored. Cognitive psychologists such as Kendall (2000) and Garnefski and Kraaij (2007) conceptualized this direction from self-regulation failure to mood disorders. They argued that biological proneness, stressful environments, and negative contextual experiences (through life span development) can

construct negative cognitive schemas and maladaptive self-regulation strategies (Koster, Fang, & Marchetti, 2014; Marroquin et al., 2015; Mauas et al., 2014).

Therefore, instead of using adaptive strategies such as refocusing on planning or positive reappraisal, individuals tend to use catastrophizing, self-blaming, or rumination strategies to interpret and manage any single event and their emotions. Thus, self-regulation failure happens and may produce the depressive symptoms in those individuals (Stark et al., 2000). In line with this view, most of the above-noted studies, in which self-regulation strategies and depression were investigated, provided remarkable evidence for this conceptualization (Garnefski & Kraaij, 2007; Kendall, 2000; Rheenen, Murray, & Rossell, 2015; Stark et al., 2000).

However, it may be unclear whether these direct linear effects can be observed in multi-factor studies particularly when loneliness and academic achievement are central to study. It was argued that when depression is a secondary problem; that is, another (physical or mental) problem caused the depression (e.g., physical burns or neuroticism - Loey et al., 2014), self-regulation may have a mediating role instead of direct linear role. Moreover, Loey et al., (2014) demonstrated that when neuroticism, as a personality trait, was entered into a study through latent growth modeling, self-regulation strategies (particularly rumination strategy) mediated the effect of neuroticism on the course of depressive symptoms. However, since depression and loneliness were reported to have a strong association with each other (Garnefski, & Kraaij, 2018; Jaremka et al., 2013; Swami et al., 2007; Wiseman et al., 1995; Wiseman et al., 2006), it is assumed that the same conceptualization may be justified for the relationship between loneliness, self-regulation, and academic achievement.

3. Loneliness, Self-Regulation, and Academic Achievement

As previously discussed, the literature review showed that the mechanisms and the processes through which loneliness and cognitive regulation mediate lower academic achievement have not been fully examined. As well, there are some different findings about these relationships. Nikmanesh et al. (2015) found a negative relationship between loneliness and cognitive regulation among students who had substance use problem. In her dissertation, Rozek (2013) demonstrated that loneliness has direct (linear) impact on cognitive regulation. Similarly, Rosenstreich et al (2015) found that loneliness can deplete students' cognitive regulation. Their findings became remarkable when they found the reverse results by practicing cognitive regulation such as mindfulness indicating that mindfulness practice may enhance students' capacities for self-regulation and decrease the effects of loneliness on students' academic achievement.

Since mindfulness and self-regulation have very common cognitive components and are associated with each other (Grecucci et al., 2015; Taylor & Mireault, 2008), and based on above noted findings, it may be that a linear relationship between loneliness, cognitive regulation, and academic achievement is possible. Accordingly, cognitive self-regulation may have a mediating role between loneliness and academic achievement.

Cacioppo et al. (2006, 2010) demonstrated that loneliness acts through an emotional-cognitive model and can be recognized as a significant indicator in lowering human functions such as academic achievement. Hawkley et al. (2010) argued that loneliness can affect emotional and cognitive regulation, and in turn creates other affective problems such as depression or cognitive difficulties. Cacioppo et al. (2006, 2009, 2011) argued that intensifying social isolation and the sense of loneliness will enhance the activation of negative [or maladaptive] cognitive

regulation strategies (e.g., catastrophizing, self-blaming, rumination, and others). As well, the intense loneliness may cause depression (Allen-Kosal, 2008; Cacioppo et al., 2006; Masi et al., 2011), and lowers social performances such as academic achievement in university students (Mattanah et al., 2012; Quan et al., 2014; Rosenstreich et al., 2015; Stoliker & Lafreniere, 2015). The university students, particularly international students, may be at risk for more intensified influences because of the nature of transition and other aforementioned factors such as language barriers, lack of friendship and others (Blazina, Settle, & Eddins, 2008; Hamaideh, Hamdan-Mansour, 2014; Quan, Zhen, Yao, & Zhou, 2014; Zhang & Goodson, 2011).

Likewise, Rosenstreich and Margalit (2015) demonstrated that the feeling of loneliness, can be enhanced by other factors such as the lack of mindfulness. This is similar to what Rosenstreich and Margalit (2015) argued that a significant role exists for loneliness in creating lower academic performance as reported also by Mattanah et al. (2012).

Thus, loneliness in multifactor studies can have either direct effect (Ceyhan & Ceyhan, 2008; Quan et al., 2014; Zarei et al., 2013) or mediating role in academic achievement (Mattanah et al., 2012; Rosenstreich et al., 2015). Such roles were also postulated for behavioral adjustment as well. For example, Quan et al. (2014) studied three factors including loneliness, coping style, and adjustment to college on 276 university students and found that loneliness has direct negative effect on academic adjustment. In contrast, Rosenstreich and Margalit (2015) demonstrated that the impact of loneliness is significant only when it leads to depletion of cognitive resources; that is, cognitive regulation has mediating role.

Accordingly, these studies informed that when loneliness and cognitive regulation strategies are investigated in multivariable studies, different associations may be assumed.

However, the direct and mediating effects of loneliness on adaptive and maladaptive strategies of self-regulation (e.g., rumination, self-blaming, catastrophizing, appraisal, acceptance, and positive refocusing) in relation to academic achievement were not fully studied. As well, it is unclear whether such relationships can be found in international students.

4. Social Connectedness, Degree of Involvement, and Gender

The literature review revealed that some socio-demographic factors in relation to students' academic achievement were central to contemporary studies, for example student–faculty interaction (Hamaideh et al., 2014), ethnic differences (DeFreitas & Rinn, 2013) urban/ rural belongingness and gender (Akessa & Dhufera, 2015), students' attitude toward instructors (Ilgan, 2013), and relationships with other students (Montgomery, 2010). Some of these factors such as social connectedness, social activity involvement, and gender were also studied in relation to loneliness and depression.

Social connectedness: As a psychological union or link individuals can feel within relationships with other people (Hare-Duke, Dening, de Oliveira, Milner, & Slade, 2019), social connectedness has close association with loneliness (Satici, Uysal, & Deniz, 2016). Using path analysis, Satici et al. (2016) studied this relationship in university students and found that experiencing a high level of social bonding can negatively affect loneliness. Foster et al. (2017) studied social connectedness and psychological problems in 224 adolescents and found that higher connection with parents, school, and community has negatively associated with depression and other psychological problems. Marraccini and Brier (2017) reported that school connectedness is associated with reduced depressive symptoms such as reduced reports of suicidal thoughts.

On campus involvement: Montgomery (2010), argued that social living in a university campus such as involvement in different types of activities and relationships may be an opportunity for international students to establish a trustworthy relationship with domestic students. In the other words, living beside local students may create a kind of connectedness that influence international students' academic achievement. Focusing on students' tendency to participate in sports activities, Firouzeh, Kamarzarin, and Irani (2018) reported that students' sports participation was significantly associated with the reduction of mental health problems. Although the literature review revealed that the lower sense of social connectedness was related to higher levels of loneliness (Hare-Duke et al., 2019; Satici et al., 2016) and depression (Foster et al., 2017; Marraccini & Brier, 2017), few studies have focused on the different types of social connectedness/social involvement in both Canadian and international university students. Some researchers argued that differences among students in terms of academic achievement are due to the types of students' relationships with instructors (Turingan & Yang 2009), or the degree of academic involvement. However, these types of relationships were not investigated comparatively between Canadian and international students.

Gender*:* Gender also has been studied in relation to depression (Cacioppo et al., 2009; Theeke, Carpenter, Mallow, & Theeke, 2019; Wiseman, et al., 1995; Wiseman et al., 2006), to loneliness (Cacioppo et al., 2009; Helm, Rothschild, Greenberg, & Croft, 2018; Shahidi, 2013), and self-regulation (Kraaij & Garnefski, 2019; Quinn & Fromme, 2010). However, a lack of consistent findings was noted among studies. For example, Dayroglu and Türüt-Asık (2007) focused on gender as a demographic variable and demonstrated that female students outperformed their male counterparts at university. In contrast to Dayroglu et al.'s (2007) research found that gender has a neutral effect size in predicting academic achievement in

international students (Hamaideh et al., 2014; Naderi, Abdullah, Hamid, & Sharir, 2008). This demographic factor (gender) was also argued as a determinant in self-regulation; that is, females show higher levels of self-regulation (Haron, Syed-Mustafa, & Alias, 2010; Quinn et al., 2010), but Yukselturk and Bulut (2009) did not find any differences in self-regulation in terms of gender. Studies on gender differences in loneliness also revealed diverse findings. Unlike some researchers who found that gender is a differentiating factor in loneliness (Mahon, Yarcheski, Yarcheski, Cannella, & Hanks, 2006), recent studies in Canada revealed that gender had no effect size in predicting loneliness (Shahidi, 2013).

Purposes of Study

Based on the above-noted literature review, it is concluded that to some extent the individual direct roles of the contributing variables (e.g., depression, loneliness, and self-regulation) in the academic achievement were previously studied in different populations. However, the present study was designed to address some aspects that not currently dealt with in the literature such as influences and connectedness for Canadian and International students and its impact on their academic achievement. Also, this research was aimed to address contradictions found in previous data, and to address inter-relationships among depression, loneliness, self-regulation, and academic achievement in both Canadian and International students comparably. Additionally, the researcher tried to explore several proposed path analysis models to gain a greater understanding of the mediating roles of above-noted variables on academic achievement. The proposed models were displayed in Figures 5, 6 and 7.

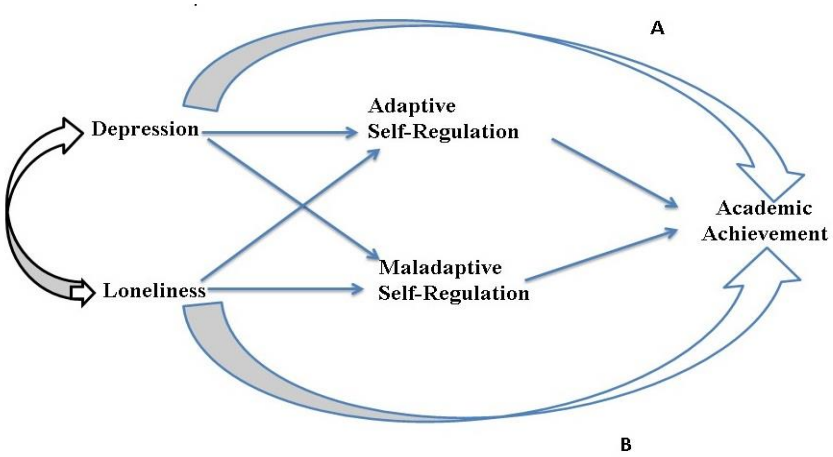


Figure 5: Hypothetical Model 1: The Mediating Effects of Self-Regulation Strategies (Adaptive and Maladaptive) on Academic Achievement through the Influences of Depression and Loneliness.

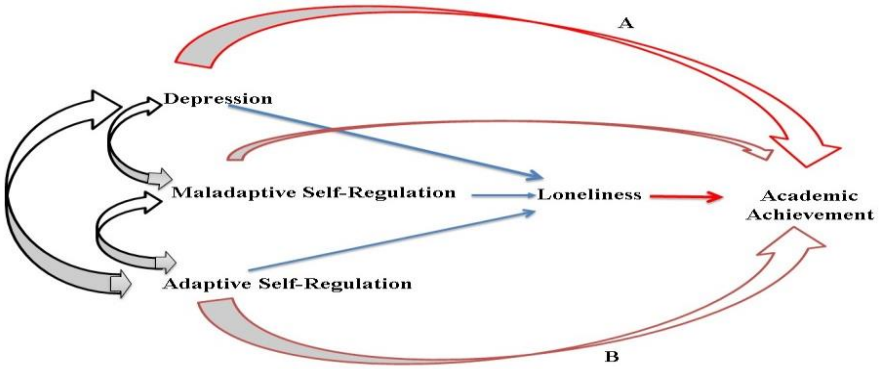


Figure 6: Hypothetical Model 2: The Mediating Effects of Loneliness on Academic Achievement Through the Influences of Depression and Self-Regulation Strategies (Adaptive and Maladaptive).

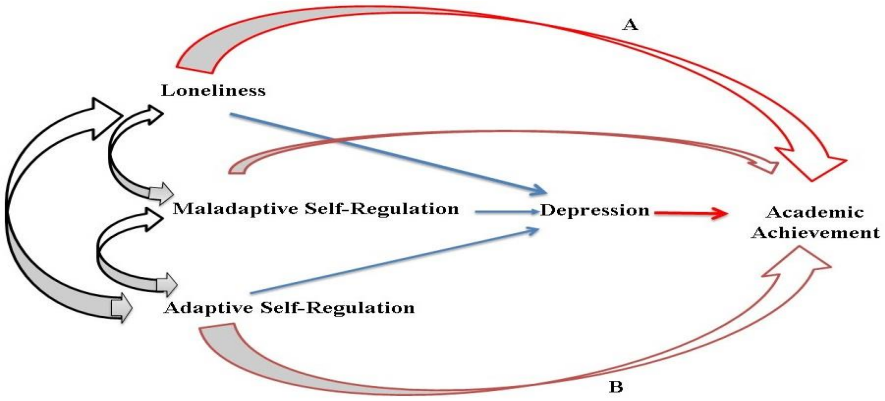


Figure 7: Hypothetical Model 3: Examining the Mediating Effect of Depression on Academic Achievement through the Influences of Loneliness and Self-Regulation Strategies (Adaptive and Maladaptive).

The Figure 5 depicts the relationships between the correlates of academic achievement as currently supported by the literature. In this Figure, the direct relationship between depression and academic achievement (path A), and the direct relationship between loneliness an academic achievement (path B) are assumed. These paths (A and B in the Figure 5) were separately corroborated by previous research (for loneliness see Mattanah et al., 2012; Rosenstreich et al., 2015; for depression see Bryan, Bryan, Hinkson, Bichrest, & Ahern, 2014; Deb et al., 2016; Khurshid et al., 2015; Turner, Thompson, Huber, & Arif, 2012).

However, if self-regulation strategies (adaptive and maladaptive) are taken to account as mediators between depression, loneliness, and academic achievement, the results may be different in terms of buffering or maximizing roles of self-regulation strategies (adaptive or maladaptive-Figure 5). Such different results may be assumed for the mediating role of loneliness (Figure 6), and the mediating role of depression (Figure 7).

Based on these aims, the following research questions were posed to gain a greater understanding of the nature of these factors and their influences on Canadian and International students' academic achievement.

Research Questions

1: What percentage of students rated the influencers listed on the Research Questionnaire as very important to their academic achievement?

2a: What percentage of students indicated they were involved in university and community activities?

2b. Was there a relationship between reported involvement in university/community activities and students' scores on the measures of depression, loneliness, self-regulation, and academic achievement (reported GPA)?

3a: How did students rate their level of connectedness to individual and institutions listed on the Research Questionnaire?

3b: Was there a relationship between reported level of connectedness to the listed Individuals/Institutions and student's scores on the measures of depression, loneliness, self-regulation, and academic achievement in terms of citizenship as well as for the overall sample?

4: Do International and Canadian students differ on the measures of depression, loneliness, self-regulation (adaptive and maladaptive), and academic achievement?

5: Are there differences in terms of gender and results on the measures of depression, loneliness, self-regulation, and academic achievement?

6: What were the interrelationships among the measures of loneliness, depression, self-regulation, and academic achievement?

7: To what degree did measures of loneliness, depression, self-regulation, university/personal influencers, university involvement, and social connectedness predict academic achievement for International and Canadian students and overall sample?

8: Which of the proposed path models can adequately identify the suitable paths through which the variables create the maximum likely association and maximum effect size in academic achievement?

Chapter III: Method

This chapter contains the operational definition of the variables used in this study as well as the descriptions of the participants, measures, data analysis, procedure, and ethical considerations.

Operational Definition of Relevant Research Variables

Depression is a "mental state characterized by feelings of sadness, loneliness, despair, low self-esteem, and self-reproach; accompanying signs include psychomotor retardation or, at times, agitation, withdrawal from interpersonal contact, and vegetative symptoms, such as insomnia and anorexia, and emotional state that accompany with negative affects." (Sadock et al., 2015 p. 5005). In this research, depression was measured by Kutcher Adolescent Depression Scale -11(Brooks & Kutcher, 2001). This scale has also been used in research on young adults (Mojs et al., 2015; Mousavi et al., 2019; Shahidi et al., 2014; Shojaee et al., 2016).

Loneliness, as an unpleasant experience that occurs when a person's network of social relationships is deficient quantitatively or qualitatively, was measured by R-UCLA Loneliness Scale (Russell, Peplau, & Ferguson,1978).

Self-Regulation is defined as a human cognitive capacity through which "human can create visualized futures that act on the present; construct, evaluate, and modify alternative courses of action to secure valued outcomes; and override environmental influences" (Bandura, 2006 p.164). In this study, emotional cognitive regulation strategies were measured by the Cognitive Emotion Regulation Questionnaire (Garnefski, Kraaij, & Spinhoven, 2002; Kraaij & Garnefski, 2019).

Academic Achievement for this thesis, referred to students' self-reported grade point average. ***Students*** in this research, were International and Canadian undergraduate students enrolled at Mount Saint Vincent University.

Participants

Four hundred and eighty-eight Canadian and International students, aged 19 to 37 years old, attending Mount Saint Vincent University (MSVU) in fall 2018 participated in this study. Of this number, 61 participants were excluded from the study as some were under 19 years old while others left one or two pages of measures blank, creating missing data. Therefore, the final number of participants was 427 (120 for international students and 307 for Canadian students). This sample size met basic statistical assumptions for analyzing data (Hooman, 2010; Krejcie & Morgan, 1970; Taherdoost, 2017) and examining psychometric properties of scales (Gierl, 2014a, b).

Measures

Based on the purpose of study, research hypotheses, and questions, the following tools (scales and questionnaires) were used to measure the noted variables.

Research Questionnaire**:** The author-developed Research Questionnaire (Appendix 3) was based on a thorough review of the literature and the issues being addressed in this study. Items addressed demographic information such as age, gender, citizenship, living arrangements, and degree program. In addition, some items examined the level of connectedness with significant others and involvement in university/community activities. For some items, students selected a response from given check-boxes. Other items required students to respond using a 5-point Likert scale.

***Kutcher Adolescent Depression Scale (KADS-11)*:** The KADS-11 (Appendix 4) is an eleven-item, self-report instrument to assess depression in adolescents and to monitor symptom severity over time (Brooks & Kutcher, 2001). The scale was specifically developed to assess the cognitive, emotional, mood and behavioral symptoms of depression. The original 16-item version of the KADS was studied on the different samples of students (aged 12-22 years old) attending secondary and post-secondary schools and adolescents who were referred to healthcare clinics for the treatment of Major Depressive Disorder (MDD). During 2002 and 2004, several studies were conducted in Canada to measure KADS' sensitivity to change and its psychometric properties resulted two other versions including the KADS-11(Brooks, 2004; Brooks, Krulewicz, & Kutcher, 2003).

From the time KADS was recommended for use in health care settings Canada (Jensen, Cheung, Zuckerbrut, Ghalib, & Levitt, 2012), different versions of the scale were either developed or studied in various countries such as Nigeria (Gesinde & Sanu, 2014), Iran (Mousavi et al., 2019; Shahidi & Shojaee, 2014; Shojaee, Bulut, & Shahidi, 2016), Portugal (Quintao, David, Gusmãoa, & Kutcher, 2015), Poland (Mojs, Bartkowska, Kaczmarek, Ziarko, Bujacz, & Biedermann, 2015), and Barbados (Lowe, Lipps, Gibson, Jules, & Kutcher, 2018).

Generally, the instrument consists of 11 items. Sample items from the KADS-11 include "over the last week, how have you been 'on average' or 'usually' regarding *1) "low mood, sadness, feeling blah or down, depressed, just can't be bothered*". 2) "*Irritable, losing your temper easily, feeling pissed off, losing it*".

Items on the KADS are measured based on an ordinal scoring scale where respondents rated each item on a 4-point Likert scale with a range from 0 (hardly ever) to 3 (all of the time).

A respondent's score on the KADS-11 is obtained by summing scores on all 11 items (range of 0 to 33). Based on the total score of KADS, Kutcher et al. (2010) stated that if an individual is scored below 6, it probably indicates that he or she is not depressed and at or above this score is considered as possible depression. Usually, a cut-off score has been used to determine the sensitivity and severity of depression classifications (Brooks et al., 2001; LeBlanc et al., 2002). Therefore, in this study the *Z* score ($\mu = 0$, $SD = 1$) was preferred to determine the degree to which participants showed different levels of depression. This procedure was also used by Shojaee et al. (2016) for estimating mild depression and the severity of depression. The procedure used in the Shojaee et al.'s (2016) study revealed that the participants who received *Z* score below 1 ($Z < 1$) were most likely not depressed, those with *Z* score between 1 and 2 were sensitive to depression, and those who received scores higher than 2*Z* were most likely to be depressed.

Although the original version of the KADS was designed for assessing depression in adolescents (13 to 17 years old), the scale was developed for use with individuals who are in late adolescence (18 to 22 years) and young adults aged 19 to 36 (Gesinde & Sanu, 2014; Mojs et al., 2015; Mousavi, Shojaee, Shahidi, Cui, Kutcher, 2019; Shahidi & Shojaee, 2014; Shojaee, Bulut, & Shahidi, 2016).

LeBlanc et al. (2002) used Receiver Operating Characteristic (ROC) curve to assess the diagnostic validity of KADS. His results revealed that the KADS-11 had acceptable diagnostic validity, similar to the Beck Depression Inventory. Using two groups of participants (depressed patients who were hospitalized after diagnosis) and another group (who were not depressed and had optimum social and personal functions), Shahidi and Shojaee (2014) found that the KADS-11 had acceptable divergent validity and could discriminate between depressed and

nondepressed individuals. The convergent validity of KADS-11 through using Zung Self-Rating Depressive Scale was also examined by Shahidi and Shojaee (2014) and the result showed that both scales had acceptable correlation ($r = .80$, $p < .01$) indicating reasonable validity.

Lowe et al. (2018) used the Adolescent Depression Rating Scale (ADRS), and the major depression disorder subscale of the Revised Children's Anxiety and Depression Scale (RCADS) to examine the convergent validity KADS-11. They demonstrated that the KADS-11 had reasonable convergent validity with ADRS ($r = .62$, $p < .01$), and with RCADS, ($r = .61$, $p < .01$). As well, using 1,589 students aged 18–24, Mojs et al. (2015) employed confirmatory factor analysis and demonstrated that the KADS had acceptable construct validity that measures the main symptoms of depression. Additionally, the validity of different versions of KADS has been corroborated and replicated in past studies (Brooks & Kutcher, 2001; Brooks, e al., 2003; LeBlanc, Almudevar, Brooks, & Kutcher, 2002).

Previous studies have also showed that the different versions of the KADS were reliable (LeBlanc et al., 2002; Shahidi et al., 2014; Shojaee, et al., 2016). Results of a study by Shahidi and Shojaee (2014) demonstrated that the KADS-11 had a Cronbach's Alpha of .79. A second study by Shojaee et al. (2016) also revealed that the KADS-11 had high internal consistency ($\alpha = .88$). In addition, Shojaee et al., using the split-half method, indicated that both parts of the KADS have an acceptable reliability $\alpha = .79$ for part 1 (6 items), $\alpha = .76$ for part 2 (5 items), and $\alpha = .91$ for overall. Lowe et al. (2018) demonstrated that the KADS-11 also has reasonable internal consistency, overall $\alpha = .76$ and that the primary psychometric properties of this scale were reliable with $\alpha = .87$.

R-UCLA Loneliness Scale: The R-UCLA-LS was originally developed by Russell, Peplau and Ferguson (1978) to measure individuals' subjective feelings of loneliness (Appendix 5). The scale has different versions with either 11 items, 6 items, or 20 items. In this study, the 20-item version (Russell et al., 1980) was used. Each item implies a possible sense of loneliness in different social and interpersonal contexts caused by lack of companionship, being isolated from others, being withdrawn, or lack of empathy with others. Some examples of items include, "*I am unhappy being so withdrawn*", "*I feel left out*" and "*There is no one I can turn to*", and "*I lack companionship*". Items on the R-UCLA-LS require Likert format responses ranging from "never" to "most of the time". Each item is scored from 1 to 4 and a respondent's score on the R-UCLA-LS is obtained by summing his/her scores on all 20 items. Some items are scored inversely. Possible scores range from 20 to 80 and represent the degree to which individuals have a sense of loneliness. The R-UCLA-LS has an internal consistency (α = .94) and test-retest reliability of r = .73 (Russell's 1982 as cited in Terrell et al., 2000). In one study on loneliness and psychological well-being, Shahidi (2013) examined the internal consistency of the R-UCLA L S (20-items) using university students. Results revealed that the scale has an acceptable internal consistency with Cronbach's Alpha .87. Dogan et al. (2011) also studied the psychometric properties of the R-UCLA-LS. Their results demonstrated that the scale has both high internal consistency (.96) and test-retest reliability (.94). Likewise, Yildiz's (2016) examination of the internal consistency of the R- UCLA-LS resulted in high Cronbach alphas (α = .92).

The discriminant validity of the R-UCLA-LS was examined by Russell et al., (1980). Regarding the concurrent validity, Russell et al. (1980) noted that "loneliness scores were significantly correlated with scores on the Beck Depression Inventory (r =.62), and with the

Costello-Comrey Anxiety (r =.32) and Depression (r = .55) scales" (Russell et al., 1980 p. 475). More recently, Yildiz's (2016) examination of the correlation between the R-UCLA-LS and the Beck Depression Inventory resulted in a high correlation of .82. As well, the discriminant validity of the R-UCLA-LS was assessed by examining the correlations between the scale and other measures of mood and personality such as the Eysenck Introversion-Extroversion Scale. The results showed that R-UCLA- LS had a negative association with other scales such as the Self-Esteem Scale and Assertiveness Scale indicating acceptable discriminant validity. Shahidi (2013) used the Differential Loneliness Scale -Student Version to examine the convergent validity of the R-UCLA-LS. Results demonstrated a significant association between two measures.

Cognitive Emotion Regulation Questionnaire (CERQ): The CERQ is a multidimensional questionnaire originally developed by Garnefski, Kraaij, and Spinhoven in 2001 and 2002 (Appendix 6). The questionnaire looks exclusively at an individual's thoughts after experiencing a negative event or impulse and shows how individuals regulate their thoughts and emotions regarding different internal impulses or external events (Garnefski, Kraaij, & Spinhoven, 2002). The questionnaire has two versions, one with 36 items and the other with 18 items. In this study, the short form (18-item version) was used. The scale examined nine cognitive emotional regulation strategies that are embedded into two subscales, Maladaptive Strategies and Adaptive Strategies (Garnefski, Legerstee, Kraaij, Kommer, Teerds, 2002). Theoretical and empirical support exists for the strategies on the CERQ (Kraaij & Garnefski, 2019; Min, Yu, Lee, & Chae, 2013).

Maladaptive strategies consist of *self-blame* (thoughts of attributing the blame on yourself after an experience), *other-blame* (thoughts of placing the blame for what you have

experienced on the environment or another person), *rumination or focus on thought* (type of repetitive thinking about the feelings associated with the negative event), and *catastrophizing* (the thoughts of explicitly emphasizing the horror of what you have experienced) (Garnefski & Kraaij, 2007; Jermann et al., 2006; Kraaij & Garnefski, 2019; Min, Yu, Lee, & Chae, 2013).

Adaptive strategies include *putting into perspective* (the thoughts of brushing aside the severity or painfulness of the event/emphasizing the relativity when comparing it to other events), *positive refocusing* (thinking about cheerful and pleasant issues instead of thinking about the actual event), *positive reappraisal* (the thoughts of creating a positive interpretation of the event in terms of personal growth), *acceptance* (thoughts of accepting what you have experienced and resigning yourself to what has happened), and *refocus on planning* (thinking about monitoring and handling the negative event through finding suitable coping ways) (Bruyneel & Dewitte, 2012; Garnefski & Kraaij, 2007; Kraaij & Garnefski, 2019; Loey et al., 2014; Potthoff et al., 2016).

Each item is measured and scored on a five-point Likert scale from 1 (almost never) to 5 (almost always). Sample items from the CERQ include, *I often think that what I have experienced is much worse than what others have experienced" (*catastrophizing)*; "I feel that others are responsible for what has happened" (*putting blame on others)*; "I think that I can become a stronger person as a result of what has happened" (*positive reappraisal). A respondent's score on CERQ is obtained by summing scores on all 18 items and subscales' items (range from 18 to 90).

The internal consistency of the CERQ was between $\alpha = .70$ and $\alpha = .86$ in a primary study (Garnefski et al., 2002). Kraaij, et al. (2003) conducted a study on a sample of 1,310

adolescents attending an intermediate vocational education school and obtained an internal consistency of α = .90 for the CERQ. Garnefski and Kraaij, (2007) also conducted a study on 611 people and found that none of the subscales of the CERQ had Cronbach's Alpha below of .75. A one year follow up using test-retest reliability results were significant for all subscales of the CERQ, range from $r = .48$ to $r = .65$ $p < .01$ (Garnefski & Kraaij, 2007). Hassani (2016) studied the psychometric properties of the CERQ using 420 Iranian university students (220 male and 200 female) in the 2009-2010 academic year. In his study, the internal consistency of CERQ for all subscales was between $\alpha = .68$ and $\alpha = .83$.

Using factor analysis, Garnefski et al. (2001, 2002) examined the construct validity of the CERQ. Results indicated loadings on the above-noted nine factors. In addition, Garnefski and Kraaij (2007) used confirmatory factor analysis to corroborate that the previously noted factors accounted for 68.2% of the variance. The developers of the CERQ examined the construct validity of the CERQ twice, with a one-year interval for follow up, and reported that "communalities ranged between .55 and .78, factors were fully in accord with the a priori assignment of items to the scales, while all loadings on the a priori factors exceeded .55" (Garnefski & Kraaij, 2007 p. 144).

Three different types of validity (factorial, convergent, and criterion validity) of the 18 item CERQ were recently examined by Ireland et al. (2017). In their research on 795 participants, the validity of all nine factors in the short form of the CERQ were supported. Hassani (2016) also examined the validity of the CERQ by using three methods including confirmatory factor analysis (CFA), criterion method, and correlations among all subscales. The results showed that the nine factors of the CERQ account for 75% of the total variance (CFA), the maladaptive strategies were associated with symptoms of depression (criterion validity), and

the correlation among subscales were significant. Other studies supported the reliability and validity of the CERQ (Garnefski, et al. 2004). Before analyzing data for the current study, the internal consistency of the CERQ was examined. Results showed acceptable reliability (α = .79) for the total score. Also, the internal consistency for the subscale of maladaptive was α = .72, and for the subscale of adaptive subscales was α = .71. In one study through using Symptom Check List (SCL-90) and CERQ, Garnefski and Kraaij (2018) demonstrated the significant associations between maladaptive components of CERQ and depressive symptoms. In 2018, a psychometric analysis of CERQ in 872 individuals revealed that the 18-item version of CERQ is an acceptable instrument for using in clinical contexts (Holgado-Tello, Amor, Lasa-Aristu, Domínguez-Sánchez, & Delgado, 2018). Also, Holgado-Tello et al. (2018) demonstrated that the criterion validity of CERQ with Beck Depression Inventory-BDI and State-Trait Anxiety Inventory-STAI is similar to the larger versions.

Through using Beck Depression Inventory-BDI and CERQ on 650 students of Yazd University, Dadfarnia, Hadianfard, Rahimi, and Aflakseir (2020) reported the significant positive associations among maladaptive emotion regulation strategies (e.g., self-blame, rumination, catastrophizing, other-blame) and depression. Also, in their research, adaptive emotion regulation strategies (e.g., acceptance, reorientation, plan-focus, perspective taking) were negatively correlated with depression. Generally, they concluded that self-blame, reorientation, catastrophizing, plan-focus, and other blame could explain 34% of depression variance significantly (Dadfarnia et al., 2020).

Grade Point Average (GPA): Students self-reported their level of academic achievement. One question on the previously discussed Research Questionnaire (Appendix 3) asked students to provide their exact GPA (if known). If they did not remember their exact GPA, students were

asked to indicate which of the given options best represented their current GPA. Examples of options included 3.7- 4.3 (A range), 2.7-3.3 (B range) and 1.0-1.3 (D range).

Academic Self-Report Questionnaire (ASRQ): The ASRO (Appendix 7) is an author-developed questionnaire to assess students' evaluation of their academic experiences. Each item on the ASRQ is measured and scored using a five-point Likert scale from 0 (poor) to 4 (excellent). Sample items from ASRQ include: "*Generally my academic achievement is…"*, and "My grade point average is …." A respondent's score on the ASRQ is obtained by summing scores on all 16 items (range from 0 to 64).

Procedure

Following ethics approval from the Mount Saint Vincent University (MSVU) Research Ethics Board, data collection procedures were initiated. First, faculty members at MSVU, who had on-campus classes in fall 2018, were selected from those listed on the MSVU's WebAdvisor site; then, a few classes for each faculty were recognized and listed. The selected faculty were contacted by email for permission to distribute the research packages in their classes. When permission was granted, a follow-up email was sent to the faculty member, confirming class time, number of students, and class location. The researcher arrived at individual classes at the agreed upon times, introduced himself to students, and explained the purpose of the study.

Students were assured, verbally and in writing, that participation was voluntary, that the information they provided on all measures was confidential, and that no identifying information was required (Appendixes 1 and 2). They were informed that all questionnaires would be destroyed after the data was coded and entered into a password protected computer. Students were given an opportunity to ask questions. Research packages were then distributed to all

students. Those who chose to participate were given time to read the covering letter, address any concerns, and complete the measures in the package. The research packages were collected after completion. Students were thanked for their cooperation and participation and reminded to keep the covering letter so that they could contact the researcher if they wanted a summary of the results or had any further questions.

Data Analysis

The current study was multi-correlational research, as it involved examining possible relationships among existing states or situations in the same participants (Wiersma et al., 2009). When using correlational methods in multivariable studies, researchers usually attempt to describe the effect size (strength) of relationships or associations between phenomena (variables); identify the paths through which a series of variables create the maximum likely association; and distinguish the direct or mediating effects of each contributing variable on the dependent (criterion) variable (Cohen, 1996; Katz, 2006; Meyers, Gamst, & Guarino, 2006). Also, researchers usually tend to examine the predictability of dependent (criterion) variable through a series of exogenous variables. Such goals are central to multivariate studies. Therefore, two major inferential statistical procedures, (multiple regression for prediction and path analysis to determine the mediating roles of variables) were used to analyze data. Multiple regression was also used to explore the effect size of each contributing variable in predicting academic achievement. In addition, bivariate correlation, ANOVA, t-test, Chi Square, and nonparametric procedures were used to answer various research questions.

Before using inferential statistical procedures, means and standard deviations were calculated for all demographic and contributing variables. The descriptive analysis helped the

researcher analyze the primary assumptions of inferential statistics and provided insight into possible measurement errors. However, the major assumptions of this procedure such as normality (normal distribution of data – Garson, 2012), independence of errors (*t* errors should be independent of one another to indicate that participants are responding independently – Cohen, 1996; Katz, 2006), homoscedasticity (equal variance of errors across all levels of the exogenous variables), and other assumptions were tested statistically before analyzing the data.

Through path analysis (as a type of structural equation modeling - SEM), the most likely relational paths, and the mediating roles of the contributing variables in relation to the endogenous variable were examined. Path analysis is one of the forms of SEM in which the correlation or the covariance matrix of common factors is built to identify the direct and indirect effects among the contributing variables (McDonald & Ringo Ho, 2002; Pearl, 1998, 2014). Statistically, in path analysis, which is a developed form of regression, there are no straightforward tests to determine model fit (Suhr, 2008). In contrast, multiple tests are used such as Chi-Square, Comparative Fit Index (CFI), Root-Mean-Square-Residual (RMR); Goodness-of-Fit (GFI) Adjusted Goodness-of-Fit (AGFI); and Tucker-Lewis Index (TLI) to evaluate the model fit (Suhr, 2008). Hence, the measurement errors are minimized (close to zero). Instead, a logical graphical language provides a convenient and powerful way to present complex relationships while assuming different direct and indirect arcs (MacDonald, 2002; Suhr, 2008).

Therefore, one of the main advantages of this method is to provide researchers with an opportunity to assess the mediating roles of factors in a multivariate study. For example, the addition of some variables to the X → Y relation can create different probable linear relationships such as X→ M →Y, or X →M→ H→ Y or non-linear relationships (Figure 8). In

this way, each predictor variable will be added and replaced with another variable to assess its roles.

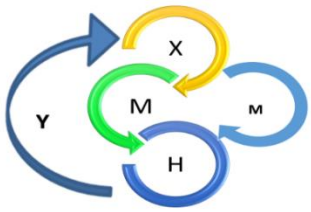


Figure 8: Non-Linear Relationships amongst Variables

With this type of controlling and through the zero assumption for error measurement, the developers of SEM, Wright (1921 as cited in Pearl, 1998) and Haavelmo (1943 as cited in Pearl, 1998) claimed that this method can be used to evaluate causal relationships among variables. This notion of causality has been followed by many researchers (Kenny, 1979 as cited in Bollen & Pearl, 2013; MacKinnon, Fairchild, & Fritz, 2007). However, there are some scholars who criticized the notion of causality and argued that path analysis does not provide social scientists with the evidence required to support pure causality interpretation as it lacks the rigor found in controlled experiments (Bollen & Pearl, 2013). However, in this research the non- causality view was followed and the direct and indirect relationships (mediating roles) among the contributing variables (depression, self-regulation, loneliness, and academic achievement) were studied through path analysis.

To determine the mediation roles of the variables, path analysis requires 1) a significant relation between a predictor (X) and the criterion (Y), 2) a significant relation between the predictor (X) and the mediator (Z), and 3) a significant relation between the mediator (Z) and the criterion (Y) (MacKinnon, Fairchild, & Fritz, 2007; Rucker, Preacher, Tormala, & Petty, 2011).

These relationships, which are usually obtained through regression, should also have enough evidence to support the assumed models.

Ethical Considerations

Ethical principles require the commitment of researchers to respect and protect participants, to engage in honest and thoughtful inquiries and rigorous analysis, and to ensure that the results of the study are disseminated. The current research followed the ethical principles of the University Research Ethics Committee at MSVU which are articulated by the Tri-council Policy Statement: Ethical Conduct for research Involving Humans. Accordingly, the current research aimed to minimize the following ethical issues:

Personal Information and Possible Harms

Participants in this research were 19 years old or older. All potential participant as well as their professors were informed, both verbally and in a written covering letter, of their rights. Participation was voluntary. Those who chose to participate could decline to answer any questions or to withdraw from the study at any time without penalty. Personal identifying information was not required on any of the measures. Efforts were made to protect the confidentiality of participants' responses. The researcher could not identify any participants by name or from information on the measures. Responses were coded using a numerical system to ensure that participant anonymity was maintained.

While there was no physical harm associated with this research and the potential for emotional harm was very low, the researcher was mindful that completing the questionnaires may resurrect some traumatic memories for some students. Therefore, the covering letter contained contact information for counseling services.

Confidentiality and Research Results

Reasonable efforts were made to maintain and protest the confidentiality of the data that was collected. Questionnaires were only administrated after receiving approval from the University Research Ethics Committee at MSVU. Data from the surveys were coded and stored on a password protected computer. Hard copies of the surveys were shredded once the data had been entered. To allow time for dissemination of the information through conference presentations and published articles, electronic data files are being kept for five years following the thesis defense and then deleted from the computer**.** Only statistical data were reported in this thesis research and only group statistical data will be noted in future presentations or papers. Participants were provided with contact information in the covering letter for this study so they could contact the researcher if they wanted a copy of the results.

Chapter IV: Results

This chapter is composed of three parts. The first part is exploring data to gain appropriate information about the features of data to ensure that the underpinning assumptions of statistical procedures are not violated through the analysis of data. The second part focused on the descriptive information of participants generated from the Research Questionnaire. Descriptive measures such as mean, variance, standard deviation, and percentage were used to summarize general information about participants as well as their perceptions on select items. The last part of this chapter is composed of the results of inferential statistical analysis related to the research questions. Based on the nature of research questions, bivariate correlation, multiple linear regression, *t*-test, ANOVA, path analysis, and some nonparametric procedures were used to examine the research questions and hypotheses.

Exploring the Data

Exploration of the data focused on sample size, normality, and the equality of variance. The 2018 enrolment at Mount Saint Vincent University (MSVU) indicated 3,857 students, 86% of whom were Canadian students and 14% International students (Office of Institutional Analysis -OIA - MSVU 2018). In this study, 427 students participated, 28.1% (n=120) were International students and 71.9% (307) were Canadian. The overall number of participants per group were statistically appropriate (Beshlideh, 2012; Hooman, 2010; Krejcie & Morgan, 1970). Beshlideh (2012) noted that the number of participants should be at least 15 per variable for linear regression and other statistical procedures. Since the current research deals with 3 to 7 major independent variables in each analysis, the overall number of participants (N = 427) is adequate. Further exploration of the data revealed limited missing data and only on the Research (demographic) Questionnaire.

Normalcy was explored for all variables using the Kolmogorov-Smirnova test, and the Shapiro-Wilk test, with *P* greater than .000 ($p > .000$). Results showed that the data distribution did not violate basic assumptions of statistic procedures (from $p > .07$ to $p > .23$). Since the equality of variances for the groups of students is a necessary assumption before using the analysis of variance (e.g., ANOVA, etc.), the Levene's Test for Equality of Variances was examined for each research question and the results were acceptable. In addition, skewness and kurtosis were minor for major contributing variables. An inspection of the Box plot, the Normal Q-Q Plot, the Detrended Normal Q-Q Plot, plus the histograms for the KADS-11, R-UCLA L S20-items, CERQ, ASRQ, and reported GPA indicated that the data satisfied the statistical requirements with regard to overall sample size.

Descriptive Information of Participants

As the Table 1 shows, most of Canadian students (65.5%) and International students (69.2 %) were between 19 and 23 years old. A smaller portion of Canadian (25.1%) and International students (20%) were between 24 and 30 years old. Only 9.8% of the participants indicated they were 31 or older. In terms of gender, both groups were somewhat similar. However, the ratio of female to male students in the Canadian group (78% female, 20.5 male) was more in line with the university ratio (76% female, 24% male) than in the International group (65.8% female, 33.3% male). Sixty-four percent of the Canadian students stated they were single compared to 82.5% of the International students. Canadian students were more likely to be living with their parents (26.1%), with family members (23.5%), or on their own (17.3%). International students were more likely to live on their own (26.7%), in the university residence (17.5%), or with family members (17.5%). The distribution of siblings in the International group was almost similar across the categories of “no siblings” to “more than three siblings” (between

19% and 22%); whereas most of the Canadian group had one or two siblings (together 66.2%). Although disciplines were not studied in relation to main variables, International students in this study were mainly enrolled in the Business and Tourism disciplines (almost 52%) compared to only 16.3% in the Canadian sample and 21% in the university overall. Twenty-five percent (25%) of the Canadian students were in the Education program compared to 6.7% of the International students and 5.5% of all the university students, and an additional 15% were enrolled in Psychology. Few Arts students (3.26% Canadian and 4.2% International) were participants, yet Arts is the largest program at the university with slightly over 22% of all students in Arts programs.

Table 1
Summary of Demographic Information on Participants

Variables	Description	Canadian Samples (N=307)		International Samples (N=120)		Overall Sample (N=427)	
Age		N	%	N	%	N	%
	19-23	201	65.5	83	69.2	284	66.5
	24-30	77	25.1	24	20.0	101	23.7
	31-36	16	5.2	7	5.8	23	5.4
	>36	13	4.2	6	5.0	19	4.4
Gender							
	Female	241	78.5	79	65.8	320	74.9
	Male	66	21.5	40	33.3	103	24.1
Citizenship							
	Canadian Students	307	100	-	-	307	71.9
	International Students	-	-	120	100	120	28.1
Marital Status							
	Single	198	64.5	99	82.5	297	69.6
	Married	25	8.1	10	8.3	35	8.2
	Divorced	2	.7	1	.8	3	.7
	Separated	4	1.3	0	0	4	.9
	Common Law	41	13.4	5	4.2	46	10.8
	Others	35	11.4	5	4.2	40	9.4
Residential Status							
	Family members	72	23.5	21	17.5	93	21.8
	Parents	80	26.1	12	10.0	92	21.5

	Siblings	6	2.0	14	11.7	20	4.7
	Relatives	5	1.6	2	1.7	7	1.6
	Non-family members	53	17.3	15	12.5	68	15.9
	On your own	53	17.3	32	26.7	85	19.9
	In student residence	24	7.8	21	17.5	45	10.5
	Others	14	4.6	3	2.5	17	4.0
Number of Siblings							
	None	37	12.1	27	22.5	64	15.0
	One	119	38.8	26	21.7	145	34.0
	Two	84	27.4	27	22.5	111	26.0
	Three	30	9.8	17	14.2	47	11.0
	More than three	32	10.4	23	19.2	55	12.9
Programs (Disciplines)							
	Business/Tourism	50	16.3	62	51.7	112	26.2
	Education	78	25.4	8	6.7	86	20.1
	Psychology	49	16.0	15	12.5	64	15.0
	Child and Youth Study	18	5.9	0	0	18	4.2
	Nutrition	34	11.1	10	8.3	44	10.3
	Arts	10	3.3	5	4.2	15	3.5
	Communication/Public Relation	16	5.2	2	1.7	18	4.2
	Science	52	16.9	18	15.0	70	16.4

Responses to the Research Questions

Research Question 1: What percentage of students rated the influencers listed on the Research Questionnaire as very important to their academic achievement?

Students' were asked to rate the degree to which they felt five major influencers (parents, friends of same nationality, friends of different nationalities, personal effort, and professors) had influenced their academic achievement using a 5-point Likert scale ranging from "*not at all important*" to "*very important*". Both groups reported relatively similar results when rating the degree of influence different people had on their academic achievement (Table 2). Only mild differences were noted in their responses. For example, 84.4 % of the Canadian students indicated that parents are very or moderately important influencer on their academic achievement; while 82.5% of the International students indicated that parents were very or moderately important influencers on their academic achievement. Likewise, 95% of International

students rated their own effort as very or moderately important to academic achievement compared to 97.9% of Canadian students. The pattern of responses was consistent for both Canadian and International students across all influencers.

Table 2
Influencers Students Consider Important to their Academic Achievement.

Influencers	Responses	Canadian (N=307)		International (N=120)		Overall (N=427)	
Parents		N	%	N	%	N	%
	Not at all important	16	5.2	9	7.5	25	5.9
	Slightly important	18	5.9	3	2.5	21	4.9
	Neutral	14	4.6	9	7.5	23	5.4
	Moderately important	73	23.9	32	26.7	105	24.6
	Very important	185	60.3	67	55.8	252	59.2
Friends of same nationality							
	Not at all important	33	10.7	16	13.3	49	11.5
	Slightly important	36	11.7	14	11.7	50	11.8
	Neutral	97	31.6	39	32.5	136	32.0
	Moderately important	85	27.7	31	25.8	116	27.3
	Very important	54	17.6	20	16.7	74	17.4
Friends of different nationality							
	Not at all important	49	16.0	21	17.5	70	16.4
	Slightly important	29	9.5	15	12.5	44	10.3
	Neutral	134	44.0	45	37.5	179	41.9
	Moderately important	58	18.9	25	20.8	83	19.4
	Very important	34	11.1	13	10.8	47	11.0
Own (personal) effort							
	Not at all important	2	0.7	2	1.7	4	0.9
	Slightly important	2	0.7	0	0	2	0.5
	Neutral	4	1.3	4	3.3	8	1.9
	Moderately important	34	11.1	21	17.5	55	12.9
	Very important	264	86.3	93	77.5	357	83.8
Professors							
	Not at all important	7	2.3	8	6.7	15	3.5
	Slightly important	17	5.5	2	1.7	19	4.5
	Neutral	43	14.0	17	14.2	60	14.1
	Moderately important	132	43.0	46	38.3	178	41.7
	Very important	108	35.2	45	37.5	153	35.8

Research Question 2a: What percentage of students indicated they were involved in university and community activities?

Students were given a list of university and community activities and asked to note their level of involvement with each using a 5-point Likert scale with options ranging from 1 for "*not involved at all*" to 5 "*very involved*". Student ratings of 4 and 5 were combined to provide a better indication of the percentage of student involvement in each activity.

As Table 3 showed there were no remarkable differences between Canadian and International samples in their involvement in sports. Almost 63% of the Canadian students and 53% of the International students indicated that they were not involved in sports, and only 18.4% of Canadian and 29.4% of International samples were very involved in sports. Following up using Chi-Square showed that the levels of involvement in sports did not differ by citizenship X^2 (3, N = 424) = 7.08, $p > .05$. The percentage of students who were not involved in fitness activities was somewhat similar for both groups (37.5% for Canadian and 31.7% for International students). Likewise, the percentage of students who were very involved in fitness was roughly similar in both groups (28% for Canadian and 33% for International). Following up, using Chi-Square showed that both groups did not differ significantly in their levels of involvement in fitness activities X^2 (3, N = 427) = 1.93, $p > .05$. As Table 3 showed, the percentage of different levels of involvement in off campus social events, artistic/creative, and recreational activities was roughly similar in both Canadian and International groups and Chi-Square analysis revealed that involvement in these activities did not differ by citizenship.

However, only 13% of Canadian students were very involved in student societies at MSVU compared to almost 28% of the International students. Following up, using Chi-Square confirmed that the percentage of participants that were involved in student societies at MSVU differed significantly by citizenship X^2 (3, N = 427) = 21.82, $p < .000$. International students

were also significantly more involved (21%) than Canadian students (4.2%) in student council X^2 (3, N = 427) = 43.46, p < .000, and campus social events, Canadian (21%) and International (36%), X^2 (3, N = 427) = 18.27, p <.000. International students (33.3%) were also significantly more involved in international activities than Canadian students (7.2%), X^2 (3, N = 427) = 92.31, p < .000). Overall, almost 50% or more of all participants were not involved in sports, student societies, student council, arts/creative activities, or international activities.

Table 3
Participant Level of Involvement in University and Community Activities

Activities	Responses	Canadian Samples N=307		International Samples N=120		Overall Sample N=427	
Sports		N	%	N	%	N	%
	Not involved at all	191	62.2	63	52.9	256	59.9
	Somewhat involved	38	12.4	16	13.4	54	12.7
	Moderately involved	20	6.5	5	4.2	25	5.9
	Very involved	56	18.2	35	29.4	91	21.3
Fitness activities							
	Not involved at all	115	37.5	38	31.7	153	35.8
	Somewhat involved	57	18.6	24	20.0	81	19.0
	Moderately involved	50	16.3	18	15.0	68	15.9
	Very involved	85	27.7	40	33.3	125	29.3
Student societies at MSVU							
	Not involved at all	204	66.4	52	43.3	256	60.0
	Somewhat involved	48	15.6	24	20.0	72	16.9
	Moderately involved	15	4.9	11	9.2	26	6.1
	Very involved	40	13.0	33	27.5	73	17.1
Student council							
	Not involved at all	260	84.7	68	56.7	328	76.8
	Somewhat involved	27	8.8	22	18.3	49	11.5
	Moderately involved	7	2.3	5	4.2	12	2.8
	Very involved	13	4.2	25	20.8	38	8.9
Social events on campus							
	Not involved at all	152	49.5	35	29.2	187	43.8
	Somewhat involved	64	20.8	25	20.8	89	20.8
	Moderately involved	26	8.5	17	14.2	43	10.1
	Very involved	65	21.2	43	35.8	108	25.3
Social events off campus							
	Not involved at all	124	40.4	38	31.7	162	37.9

	Somewhat involved	35	11.4	20	16.7	55	12.9
	Moderately involved	75	24.4	23	19.2	98	23.0
	Very involved	73	23.8	39	32.5	112	26.2
Artistic/creative activities							
	Not involved at all	160	52.1	47	39.2	207	48.5
	Somewhat involved	42	13.7	25	20.8	67	15.7
	Moderately involved	29	9.4	13	10.8	42	9.8
	Very involved	76	24.8	35	29.2	111	26.0
International activities							
	Not involved at all	232	75.6	41	34.2	273	63.9
	Somewhat involved	47	15.3	20	16.7	67	15.7
	Moderately involved	6	2.0	19	15.8	25	5.9
	Very involved	22	7.2	40	33.3	62	14.5
Recreational activities off campus							
	Not involved at all	129	42.0	44	36.7	173	40.5
	Somewhat involved	33	10.7	14	11.7	47	11.0
	Moderately involved	47	15.3	15	12.5	62	14.5
	Very involved	98	31.9	47	39.2	145	34.0

Research Question 2b. Was there a relationship between reported involvement in university/community activities and students' scores on the measures of depression, loneliness, self-regulation, and academic achievement (reported GPA)?

Since students' involvement in university/community activities was assessed through some ordinal questions and the other measures were interval, the Spearman's rho correlation was used to explore this research question. Results of correlations for Canadian students (Table 4a) showed that there was a negative association between student involvement with off-campus social events and loneliness r (307) = -.12, $p < .05$. However, there was a significant positive correlation between involvement with recreational activities off campus and students' reported GPA, r (307) = .12, $p < .05$. There were no other statistically significant relationships between the other types of involvement and Canadian students' scores on the measures of depression, loneliness, self-regulation, and academic achievement (reported GPA).

Table 4a
Relationship between Involvement in Select Activities and Scores on Measures of Depression, Loneliness, Self-Regulation (Adaptive and Maladaptive), and Academic Achievement for Canadian Students

Type of Involvement	KADS	UCLA Loneliness Scale	Maladaptive Self-Regulation	Adaptive Self-Regulation	Reported GPA
Sports	-.02	-.04	-.01	.03	.05
Fitness activities	.04	-.06	-.05	.08	-.01
Student societies at the university	-.09	.05	-.11	-.03	.01
Involvement with student council	.02	.02	.01	-.02	.07
Social events on campus	-.05	-.04	-.06	.09	.07
Social events off campus	-.04	**-.12***	-.10	.07	.03
Artistic/creative activities	.02	-.01	.05	.07	.06
International activities	-.03	.06	.08	.09	.10
Recreational activities off campus	-.10	-.04	-.01	.02	**.12***

*KADS- Kutcher Adolescent Depression Scale -11
**$p < .05$

The results of correlations between reported involvement in university/community activities and International students' scores on the measures of depression, loneliness, self-regulation, and academic achievement (reported GPA) are presented in Table 4b. The results indicated that involvement in International activities was negatively associated with maladaptive self-regulation r (120) = -.22, $p < .05$.

Table 4b
Relationship between Involvement in Select Activities and Scores on Measures of Depression, Loneliness, Self-Regulation (Adaptive and Maladaptive), and Academic Achievement for International Students

Type of Involvement	KADS*	UCLA Loneliness Scale	Maladaptive Self-Regulation	Adaptive Self-Regulation	Reported GPA
Sports	-.02	-.11	-.04	.05	.00
Fitness activities	-.02	-.08	-.07	.01	.05
Student societies at the university	-.03	-.01	.15	.17	.09
Involvement with student council	-.04	.05	.06	.05	.02
Social events on campus	-.03	.05	.01	-.07	-.07
Social events off campus	-.12	.00	.01	.05	-.13
Artistic/creative activities	-.05	-.11	.08	.16	-.04
International activities	.04	.05	**-.22****	.15	-.16
Recreational activities off campus	-.09	.07	.12	-.01	-.01

*KADS, Kutcher Adolescent Depression Scale -11
***p* < .05

When both groups were combined (Table 4c), involvement with artistic/creative activities had a positive association with adaptive self-regulation r (427) = .10, p < .05. Also, involvement with International activities was negatively associated with both loneliness r (427) = -.11, p < .05 and with maladaptive self-reguation r (427) = - .14, p < .05. However, this activity was positively associated with adaptive self-regulation r (427) = .14, p < .05. Other types of

activities were not significantly associated with the scores of depression, loneliness, maladaptive, adaptive self-regulation, and reported GPA.

Table 4c
Relationship between Involvement in Select Activities and Scores on Measures of Depression, Loneliness, Self-Regulation, and Academic Achievement for all Participants

Type of Involvement	KADS***	UCLA Loneliness Scale	Maladaptive Self-Regulation	Adaptive Self-Regulation	Reported GPA
Sports	-.01	-.05	-.02	.04	.03
Fitness activities	.02	-.06	-.05	.06	.00
Student societies at the university	-.06	.05	-.02	.05	.01
Involvement with student council	.01	.06	.04	.03	.01
Social events on campus	-.04	.02	-.02	.00	.01
Social events off campus	-.06	-.08	-.06	.03	-.03
Artistic/creative activities	.00	-.03	.07	.10*	.02
International activities	.00	**-.11***	**-.14****	**.14****	-.03
Recreational activities off campus	-.09	-.00	.03	.01	.08

*$p < .05$; ** $p < .01$; ***Kutcher Adolescent Depression Scale -11

Research Question 3a: How did students rate their level of connectedness to individual and institutions listed on the Research Questionnaire?

Students were asked to rate their level of connectedness to the listed individuals and institutions using a 5-point Likert scale with ratings ranging from 1 "*limited connection"* to 5 "*excellent connection"*. Ratings of 4 (*good connection*) and 5 were combined to provide an indication of which listed options students felt connected. Table 5 includes the percentage of Canadian, International, and overall responses to each type of connectedness.

As is evident in Table 5, the level of connectedness to parents, siblings, extended family members, fellow students of same nationality, fellow students of different nationality, university at whole, program in which enrolled, faculty in own department, and community are roughly similar for the Canadian and International groups. This indicated that there were not remarkable differences between Canadian and International students in their reported levels of connectedness to the above-noted individuals and institutions. Follow up using Chi-Square indicated that the differences between both groups in these types of connectedness were not significant. However, the percentage of Canadian students who had good connections with friends of same nationality (78%) was significant and expected when compared to International students (57%).

Results also demonstrated that Canadian students (53.4%) had good connections to friends of different nationality when compared to International students (42%), X^2 (3, N = 427) = 14.012, p < .000. The results also showed that International students had a significantly better connection with faculty in other departments (21%) than Canadian students (9.8%). This difference was significant, X^2 (3, N = 427) = 16.64, p < .001. Overall, 50% of participants noted they had good connections with all the individuals and institutions listed except extended family members, fellow students of the same nationality or different nationality, the university as a whole, faculty, and the community.

Table 5
Participants' Level of Connectedness with the Listed Individuals/Institutions

Type of Connectedness	Levels of Connectedness	Canadian N=307		International N=120		Overall N= 427	
Parents		N	%	N	%	N	%
	Limited	4	1.3	4	3.3	8	1.9
	Some	10	3.3	3	2.5	13	3.0
	Average	25	8.1	16	13.3	41	9.6
	Good	268	86.6	97	80.8	363	85.4
Siblings							
	Limited	35	11.4	16	12.5	50	11.7
	Some	16	5.2	10	8.3	26	6.1
	Average	44	14.3	13	11.7	58	13.6
	Good	210	68.4	81	67.5	291	68.1
Extended family members							
	Limited	21	6.9	15	12.5	36	8.4
	Some	66	21.5	21	17.5	87	20.4
	Average	95	30.9	36	30.0	131	30.7
	Good	124	40.4	47	39.2	171	40.0
Friends of same nationality							
	Limited	5	1.6	5	4.2	10	2.3
	Some	16	5.2	14	11.6	30	7.0
	Average	47	15.3	33	27.5	80	18.7
	Good	239	77.9	68	56.7	307	71.9
Friends of different nationality							
	Limited	19	6.2	6	5.0	25	5.9
	Some	32	10.4	29	24.2	61	14.3
	Average	92	30.0	35	29.2	127	29.7
	Good	164	53.4	50	41.7	214	50.1
Fellow students of same nationality							
	Limited	29	9.4	9	7.5	38	8.9
	Some	50	16.3	18	15.0	68	15.9
	Average	111	36.2	51	42.5	162	37.9
	Good	117	38.1	42	35.0	159	37.2
Fellow students of different nationality							
	Limited	37	12.1	9	7.5	46	10.8
	Some	66	21.5	27	22.5	93	21.8
	Average	109	35.5	49	40.8	158	37.0
	Good	95	30.9	34	28.3	129	30.2
University at whole							
	Limited	8	2.6	10	8.3	18	4.2
	Some	81	26.5	24	20.0	105	24.6
	Average	129	42.0	49	40.8	178	41.7
	Good	88	28.7	37	30.8	125	29.3
Program in which enrolled							
	Limited	4	1.3	4	3.3	8	1.9
	Some	29	9.4	11	9.2	40	9.4

	Average	88	28.9	39	32.5	127	29.7
	Good	184	59.9	66	55.0	250	58.5
Faculty in your own department							
	Limited	21	6.8	13	10.8	34	8.0
	Some	70	22.8	16	13.3	86	20.1
	Average	105	34.2	41	34.2	146	34.2
	Good	111	36.2	50	41.7	161	37.7
Faculty in other departments							
	Limited	147	47.9	43	35.8	190	44.5
	Some	66	21.5	16	13.3	82	19.2
	Average	64	20.8	35	29.2	99	23.2
	Good	30	9.8	25	20.8	55	12.9
Community							
	Limited	30	9.8	21	17.5	51	11.9
	Some	66	21.5	19	15.8	85	19.9
	Average	105	34.2	42	35.0	147	34.4
	Good	106	34.5	38	31.7	144	33.7

Research Question 3b: Was there a relationship between reported level of connectedness to the listed Individuals/Institutions and student's scores on the measures of depression, loneliness, self-regulation, and academic achievement in terms of citizenship as well as for the overall sample?

Spearman's rho correlation was used to assess the degree to which the level of connectedness could be associated with the major contributing factors in Canadian and International students. Table 6a, 6b, and 6c showed the correlations between all variables. For Canadian students, the KADS-11 was negatively associated with connectedness to friends of same nationality r = -15, $p < .01$, friends of different nationality r = -.12, $p < .05$, fellow students of same nationality r = -.26, $p < .01$, fellow students of different nationality r = -.24, $p < .01$, as well as with connectedness to community r = -.12, $p < .05$. In contrast, for International students, the KADS-11 had only a negative association with siblings r = -.19, $p < .05$ and friends of different nationality r = -.19, $p < .05$ (Table 6b). Scores on the R-UCLA-LS for Canadian students were negatively correlated with parents, extended family members, friends of same nationality, fellow students of same nationality, and fellow students of different nationality.

In contrast, the R-UCLA-LS had a negative association with program in which International students were enrolled $r = -.18$, $p < .05$. As Tables 6a and 6b revealed, maladaptive self-regulation did not have any associations with different types of connectedness for either group. Canadian students' scores on the ASRQ had a significant positive association with connectedness to parents $r = .12$, $p < .05$, friends of different nationality $r = .15$, $p < .01$, fellow students of the same nationality $r = .30$, $p < .01$, fellow students of different nationality $r = .26$, $p < .01$, their program $r = .16$, $p < .01$, faculty in their own department $r = .28$, $p < .05$, and their community $r = .24$, $p < .05$. The ASRQ had significant correlations with connectedness to siblings $r = .21$, $p < .05$, fellow students of different nationality $r = .26$, $p < .01$, university $r = .24$, $p < .01$, faculty in their departments $r = .25$, $p < .01$, their programs $r = .34$, $p < .01$, and their community $r = .25$, $p < .01$ for International students. Reported GPA was significantly correlated with the connectedness to parents, fellow students of same nationality, and faculty of own department for Canadian students. For International students, reported GPA had only a positive association with their connectedness to their program of study $r = .22$, $p < .05$.

Table 6a
Relationship between Connectedness to the Listed Individuals/Institutions and Scores on Measures of Depression, Loneliness, Self-Regulation, and Academic Achievement in Canadian Samples, N = 307.

Individuals/Institutions	KADS-11***	UCLA Loneliness Scale	Maladaptive SR	Adaptive SR	ASRQ	Reported GPA
Parents	-.10	**-.23****	-.03	.04	**.12***	**.18****
Siblings	-.05	-.10	.01	**.13***	.06	.03
Extended family members	-.11	**-.16****	-.06	.04	.06	.00
Friends of the same nationality	**-.15****	**-.21****	-.04	.05	.10	.05
Friends of different nationalities	**-.12***	-.11	.00	.11	**.15****	.11
Fellow student same nationality	**-.26****	**-.18****	-.07	**.16****	**.30****	**.17****

Fellow student different nationalities	**-.24****	**-.15****	-.03	**.20****	**.26****	**.12***
University as a whole	-.09	-.10	-.01	.06	**.23****	.10
Program in which you are enrolled	-.09	-.02	-.09	.01	**.18****	.07
Faculty in your department	-.09	.01	-.02	.06	**.28****	**.15****
Faculty in other departments	-.05	.04	.06	.07	.11*	.05
Community	**-.12***	**-.15****	.00	.06	**.24****	**.04**

*p < .05; **p <.01; ***Kutcher Adolescent Depression Scale -11

Table 6b

Relationship between Connectedness to the Listed Individuals/Institutions and Scores on Measures of Depression, Loneliness, Self-Regulation, and Academic Achievement in International Samples, N = 120.

Individuals/Institutions	KADS-11***	UCLA Loneliness Scale	Maladaptive SR	Adaptive SR	ASRQ	Reported GPA
Parents	-.10	.02	-.05	-.04	.13	.06
Siblings	**-.19***	-.07	-.00	-.08	**.21***	-.07
Extended family members	-.09	.10	.03	.02	.11	.09
Friends same nationality	-.08	.01	-.06	-.09	.15	.13
Friends different nationalities	**-.19***	-.10	.09	.00	.13	.09
Fellow student same nationality	-.12	-.04	.14	.06	.12	.06
Fellow student different nationalities	-.15	-.10	.03	-.04	**.26****	.15
University as a whole	-.07	.01	-.09	-.10	**.24****	.12
Program in which you are enrolled	-.09	**-.18***	-.11	.06	**.34****	**.22***
Faculty in your department	-.07	.03	-.03	-.00	**.25****	.15
Faculty in other departments	.04	.08	.07	-.13	.06	-.03
Community	-.15	.03	.06	-.08	**.25****	-.01

*p < .05; **p < .01; ***Kutcher Adolescent Depression Scale -11

When correlations were calculated for all participants, the results were roughly similar to those for Canadian students. Table 6c revealed that KADS-11(depression) was negatively correlated with connectedness to parents, siblings, extended family, friends of same and different nationality, fellow students of the same and different nationality, and community

for all participants. These associations were significant at $p < .01$. Such results were found for loneliness except loneliness was not significantly associated with connectedness to siblings and extended family. Maladaptive self-regulation had only negative association with the connectedness to the program of study in overall samples $r = -.10$, $p < .05$. Adaptive self-regulation had positive correlations with the connectedness to fellow students of the same and different nationality at $p < .01$. Except for the connectedness to the faculty of other programs, ASRQ had positive associations with all types of connectedness. Also, the reported GPA had a positive association with connectedness to parents, friends of same nationality, fellow students of the same and different nationality, university, program of study, faculty of own department, and community. These associations were significant at $p < .01$ and $p < .05$.

Table 6c

Relationship between Connectedness to the Listed Individuals/Institutions and Scores on Measures of Depression, Loneliness, Self-Regulation, and Academic Achievement (DLSA) in Overall Samples, N = 427.

Individuals/Institutions	KADS-11***	UCLA Loneliness Scale	Maladaptive SR	Adaptive SR	ASRQ	Reported GPA
Parents	**-.11***	**-.16****	-.04	.01	**.13****	**.15****
Siblings	**-.10***	-.09	.00	.07	**.10***	.01
Extended family members	**-.11***	-.10	-.03	.03	.08	.03
Friends same nationality	**-.13***	**-.16****	-.05	-.01	**.14****	**.10***
Friends different nationalities	**-.14****	**-.12***	.02	.07	**.15****	**.12***
Fellow student same nationality	**-.23****	**-.14****	-.01	**.13****	**.25****	**.14****
Fellow student different nationalities	**-.22****	**-.14****	-.01	**.14****	**.26****	**.13****
University as a whole	-.09	-.03	-.03	.02	**.23****	**.12***
Program in which you are enrolled	-.09	-.07	**-.10***	.02	**.23****	**.12***
Faculty in your department	-.08	.02	-.02	.04	**.26****	**.14****
Faculty in other departments	-.01	.07	.07	.02	.08	.01
Community	**-.13****	**-.11***	.02	.02	**.25****	.03

*$p < .05$; **$p < .01$; ***Kutcher Adolescent Depression Scale -11

Research Question 4: Do International and Canadian students differ on the measures of depression, loneliness, self-regulation (adaptive and maladaptive), and academic achievement?

To examine the performance of Canadian and International students on the different measures of depression, loneliness, self-regulation (adaptive and maladaptive), and academic achievement, independent t-tests were used. As shown in Table 7, there was a statistically significant difference in the scores on the UCLA-LS loneliness scale (M = 46.39, SD = 6.294) between International and Canadian students (M = 44.55, SD = 7.389), t (253) = -2.308, $p < .05$ indicating that International students have more of a sense of loneliness than Canadian students. However, when students' actual scores on the UCLA-LS are considered, the difference is very minor with the average scores of Canadian (M = 45.4) and International (M = 46.4) students only differing by 1 point. International students' scored significantly higher on the adaptive self-regulation measure (Cognitive Emotion Regulation Questionnaire) (M = 31.02, SD = 5.788) than Canadian students' (M = 29.45, SD = 6.028), t (425) = -2.451, $p < .05$. However, Canadian students (M =3.17, SD= 0.62), had significantly higher reported GPA scores than International students (M = 2.94, SD= 0.77), t (179) = 3.173, $p < .01$. There were no significant differences between Canadian and International students on measures of depression and maladaptive self-regulation.

Table 7
Results of t-test for Canadian and International Students on Measures Administered.

Measures*	Overall Sample N = 427		Canadian N=307		International N=120				
	M	SD	M	SD	M	SD	*t*	*df*	*P*
Loneliness	45.07	7.14	44.55	7.39	46.39	6.29	**-2.39***	425	**.01****
Depression	7.45	6.09	7.34	6.07	7.75	6.14	-0.62	425	.53
Adaptive SR	29.89	5.99	29.45	6.03	31.02	5.79	**-2.45***	425	**.01****
Maladaptive SR	23.88	5.25	23.68	5.13	24.38	5.53	-1.23	425	.22
Reported GPA	3.10	.66	3.17	0.62	2.94	0.77	**3.17****	425	**.00****

*R-UCLA-Loneliness Scale; Kutcher Adolescent Depression Scale - 11 (KADS-11); Cognitive Emotion Regulation Questionnaire (Adaptive and Maladaptive); Self-report of Grade Point Average
**$p < .01$

Research Question 5: Are there differences in terms of gender and results on the measures of depression, loneliness, self-regulation, and academic achievement?

Focusing on the means of each group, Table 8a contains the means and standard deviations of measures administered by gender and citizenship. A one-way between subjects ANOVA was conducted to determine whether the mean scores on the measurement variables differed according to gender. The results for the Canadian group (Table 8b) showed a significant mean difference between female and male in UCLA–LS (loneliness) scores F (1, 302) = 7.28, $p < .01$ with male students (M = 46.75, SD = 4.94) reporting being more lonely than female students (M = 43.93, SD =7.83). No other significant differences between female and male Canadian students were noted. Focusing on International students, all contributing variables were examined by gender. Results indicated no mean differences in the contributing variables by the gender (Table 8c).

When differences were explored for all participants combined (Table 8d), results demonstrated that male students (M = 46.67, SD =5.42) were significantly more lonely than female students (M = 44.52, SD = 7.56). Significant differences were not found on other variables.

Table 8a
Means on Measures of Depression, Loneliness, Self-regulation and Academic Achievement by Gender

Measures	Canadian		International		Overall	
	Female N=240	Male N=63	Female N=79	Male N=40	Female N=320	Male N=103
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
KADS – 11*	7.45 (6.11)	6.71 (5.74)	8.00 (6.44)	7.28 (5.62)	7.58 (6.18)	6.93 (5.67)
UCLA-LS**	43.95 (7.83)	46.75 (4.94)	46.24 (6.40)	46.54 (6.17)	44.52 (7.56)	46.67 (5.42)
Maladaptive SR	23.44 (5.20)	24.55 (4.63)	24.41 (5.24)	24.25 (6.18)	23.68 (5.21)	24.43 (5.28)
Adaptive SR	29. 38 (6.08)	29.49 (5.88)	31.51 (5.85)	29.83 (5.45)	29.91 (6.08)	29. 62 (5.69)
Self-Report of AA	40.67 (9.76)	41.42 (12.72)	38.27 (10.45)	39.20 (11.67)	40.08 (9.97)	40.55 (12.31)
Reported GPA	3.16 (0.59)	3.18 (0.64)	3.00 (0.77)	2.80 (0.75)	3.12 (0.65)	3.04 (0.71)

*Kutcher Adolescent Depression Scale -11
**UCLA-Loneliness Scale

Table 8b
ANOVA for Measures of Depression, Loneliness, Self-regulation and Reported GPA by Gender and Citizenship (Canadian Samples).

Measures		df	SS	MS	F	P
KADS - 11	BG*	1	27.48	27.48	0.76	.39
	WG*	302	10990.30	36.39		
UCLA-LS	BG	1	391.21	391.21	**7.28****	**.01****
	WG	302	16239.55	53.77		
	BG	1	62.30	62.30	2.40	.12

Maladaptive SR	WG	302	7851.27	26.00		
Adaptive SR	BG	1	0.60	0.600	0.02	.90
	WG	302	11022.35	36.50		
Self-Report of AA	BG	1	27.79	27.79	0.26	.61
	WG	302	32941.56	109.08		
Reported GPA	BG	1	0.04	0.04	0.10	.75
	WG	302	111.58	0.37		

*BG, Between Group; WG, Within Group; ***p* < .01

Table 8c

ANOVA for Measures of Depression, Loneliness, Self-regulation and Reported GPA by Gender and Citizenship (International Samples).

Measures		df	SS	MS	F	P
KADS - 11	BG*	1	13.84	13.84	0.36	.55
	WG**	117	4467.08	38.18		
UCLA-LS	BG	1	2.46	2.46	0.06	.81
	WG	117	4680.06	40.00		
Maladaptive SR	BG	1	0.703	0.703	0.02	.88
	WG	117	3628.73	31.02		
Adaptive SR	BG	1	74.880	74.88	2.29	.13
	WG	117	3829.84	32.73		
Self-Report of AA	BG	1	23.13	23.13	0.20	.66
	WG	117	13829.51	118.20		
Reported GPA	BG	1	1.017	1.02	1.72	.19
	WG	117	69.16	0.59		

*Between Group; ** Within Group

Table 8d

ANOVA for Measures of Depression, Loneliness, Self-regulation and Reported GPA by Gender and Citizenship (Overall Samples).

Measures		df	SS	MS	F	P
KADS - 11*	BG**	1	33.56	33.56	0.91	.34
	WG	421	15483.29	36.78		
UCLA-LS	BG	1	361.43	361.43	**7.17*** **	**.01*** **
	WG	421	21232.16	50.43		

Maladaptive SR	BG	1	44.73	44.73	1.63	.20
	WG	421	11538.70	27.41		
Adaptive SR	BG	1	6.28	6.28	0.18	.68
	WG	421	15124.84	35.93		
Self-Report of AA	BG	1	17.87	17.87	0.16	.69
	WG	421	47234.53	112.20		
Reported GPA	BG	1	0.52	0.52	1.17	.28
	WG	421	185.67	0.44		

*KADS-11; Kutcher Adolescent Depression Scale
**BG, Between Group; BW, Within Group
***$p < .01$

Research Question 6: What were the interrelationships among the measures of loneliness, depression, self-regulation, and academic achievement?

To analyze the interrelationships among the measured variables for Canadian and International students as well as overall, bivariate (Pearson) correlation were used. The results of these correlations are displayed in Table 9. The pattern of correlations among the measured variables in terms of citizenship were similar. That is, the interrelationships among measured variables in the Canadian and International groups were roughly similar. However, the UCLA-LS (loneliness) and maladaptive self-regulation measures were significantly correlated with self-reported GPA for the Canadian group but not the International.

Table 9

Bivariate Correlations among Measurement Variables for Canadian, International, and Overall Sample

			Variables				
Groups		Variables***	2	3	4	5	6
Canadian Samples N=307							
	1	KADS-11	**.34****	**.18****	-.04	**-.44****	**-.27****
	2	UCLA-LS	1	**.39****	**-.15****	**-.21****	**-.26****
	3	Maladaptive SR		1	**.40****	-.03	**-.14***
	4	Adaptive SR			1	.07	.01
	5	ASRQ				1	**.59****
	6	GPA					1
International Samples N=120							
	1	KADS-11	**.26****	**.27****	.09	**-.24****	**-.29****
	2	UCLA-LS	1	**.21***	**-.28****	-.17	-.18
	3	Maladaptive SR		1	**.42****	-.08	-.14
	4	Adaptive SR			1	.11	.05
	5	ASRQ				1	**.51****
	6	GPA					1
Overall Sample N=427							
	1	KADS-11	**.32****	**.21****	.01	**-.38****	**-.28****
	2	UCLA-LS	1	**.34****	**-.17****	**-.21****	**-.24****
	3	Maladaptive SR		1	**.41****	-.05	**-.14****
	4	Adaptive SR			1	.07	.00
	5	ASRQ				1	**.57****
	6	GPA					1

*p<.05; **p< .01; ***KADS-11=Kutcher Adolescent Depression Scale-11; UCLA-LS=UCLA Loneliness Scale; Maladaptive SR= Maladaptive Self-Regulation; Adaptive SR=Adaptive Self-Regulation; ASRQ=Academic Self-Report Questionnaire; GPA= Grade Point Average; N =Number of samples; M = Mean; SD = Standard Deviation

Overall results indicated significant, positive correlations between the KADS-11 and the UCLA-LS (r = .318, p < .01), and maladaptive self-regulation (r =.210, p < .01), and significant negative correlations between the KADS-11 and the ASRQ (r = -.38, p < .01) and GPA (r = -.28, p < .01). These results indicated that decreases in student's scores on the measure of depression, KADS-11, are associated with decreased levels of loneliness and maladaptive self-regulation,

whereas increased depression scores on KADS-11 are associated with decreased scores on the ASRQ and self-reported GPA. Similar results were found for the loneliness scale (UCLA-LS). Nevertheless, there was a significant negative relationship between loneliness and adaptive self-regulation. Overall, students' GPAs were negatively associated with all variables except adaptive self-regulation. The positive association between GPA and ASRQ ($r = .567$, $p < .01$) was expected and revealed that these variables are related to each other.

Research Question 7: To what degree did measures of loneliness, depression, self-regulation, university/personal influencers, university involvement, and social connectedness predict academic achievement for International and Canadian students and overall sample?

The procedure of multiple linear regression was used to analyze the predictability of academic achievement through the variables of depression, loneliness, adaptive self-regulation, maladaptive self-regulation, academic self-report, influencers of academic achievement, involvement in university activities, and different types of social connectedness.

All variables were entered in the regression equation using the stepwise procedure to calculate the portion of variance of each factor in predicting academic achievement. Stepwise procedure prioritizes each variable entered into the equation based on the highest correlation between predictors and criterion variable. This procedure was applied separately for Canadian students, International samples, and all participants. The results are shown in the Tables 10, 11, 12 and the Figures 9, 10, and 11.

As the results show, six regression models emerged from the stepwise regression analysis for Canadian group (Table 10). In Model 1, loneliness $R = .28$, F (1, 289) = 25.01, $p < .000$ had a significant contribution in predicting academic achievement $\beta = -.28$, $p < .000$. In Model 2, both loneliness and depression (KADS-11) $R = .342$, F (2, 288) = 19.08, $p < .000$ changed R^2 from.08 to .12, accounting for 12% of the variance in academic achievement. In Model 3, when

connectedness to parents was added to the equation with the three predictors of loneliness, depression, and connectedness to parents, 15% of the variance was accounted for (R= .38, F (3, 287) = 16.34, p < .000).

For Model 4, connectedness to faculty of one's own department was added to the equation and together with previous three predictors accounted for 17% of the variance for academic achievement in the Canadian group (R= .41, F (4, 286) = 14.27, p < .000). The variable of involvement with international activities was added to the regression equation for Model 5 R=.43, F (5, 285) = 12.74, p < .000. With regard to R^2, Model 5 could predict 18% of the variance of academic achievement. Model 6, R = .44, F (6. 284) = 11.49, p < .000 included six variables (loneliness, KADS, connectedness to parents, connectedness to faculty in your department, involvement with international activities, and connectedness to the community and could predict 20% of variance of academic achievement in Canadian students. The P.P Scatter plot (Figure 9) displayed that the relationship between the above-noted predictors and academic achievement (reported GPA) is linear. For Canadian students adaptive and maladaptive self-regulation were removed through stepwise regression because of the nonsignificant relationships with academic achievement.

Table 10
The Results of Multiple Regression to Predict Academic Achievement in Canadian Samples

Models	Predictors*	U Beta	S Beta	R	R^2	R^2 change	F
Model 1	(Constant)	4.25					
	UCLA Loneliness Scale	-0.02	-.28	.28	.08	.08	**25.01*** **
Model 2	(Constant)	4.12					
	UCLA Loneliness Scale	-0.02	-.21	.34	.12	.04	**19.08*** **
	KADS-11**	-0.02	-.21				
Model 3	(Constant)	3.30					
	UCLA Loneliness Scale	-0.02	-.19	.38	.15	.03	**16.34*** **
	KADS-11	-0.02	-.19				
	Connectedness to parents	0.19	.17				
Model 4	(Constant)	3.05					
	UCLA Loneliness Scale	-0.02	-.19	.41	.17	.02	**14.27*** **
	KADS-11	-0.02	-.18				
	Connectedness to parents	0.18	.17				
	Connectedness to faculty in own department	0.09	.14				
Model 5	(Constant)	2.95					
	UCLA Loneliness Scale	-0.02	-.21	.43	.18	.02	**12.74*** **
	KADS-11	-0.02	-.16				
	Connectedness to parents	0.19	.17				
	Connectedness to faculty in own department	0.09	.14				
	Involvement with international activities	0.09	.13				
Model 6	(Constant)	3.15					
	UCLA Loneliness Scale	-0.02	-.23	.44	.20	.01	**11.49*** **
	KADS-11	-0.02	-.16				
	Connectedness to parents	0.20	.18				
	Connectedness to faculty in own department	0.12	.18				
	Involvement with international activities	0.10	.15				
	Connectedness to the community	-0.08	-.12				

*Predictor variables; **Kutcher Adolescent Depression Scale-11; ***$p < .000$

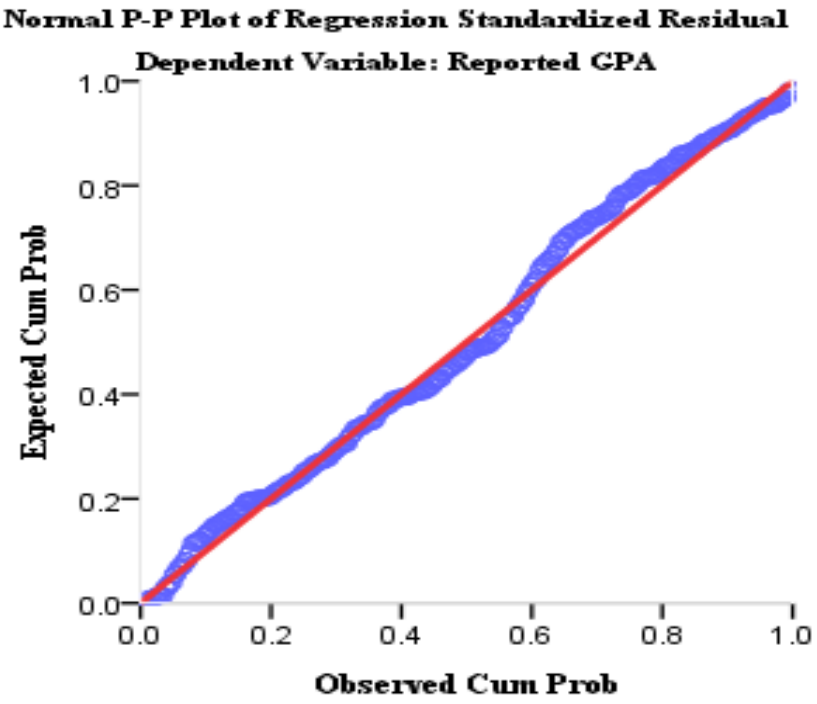


Figure 9: Normal P-P Plot of Regression Standardized Residual for Academic Achievement (Reported GPA) in Canadian Samples.

The regression analysis for the International group also created six models (Table 11). In Model 1, the KADS (depression) (R = .30, F (1, 111) = 10.58, p < .000) had a significant contribution in predicting academic achievement. In Model 2, depression, and influence of friends of different nationalities (R = .36, F (2, 110) = 8.13, p < .001) changed R^2 from .09 to .13, p < .05. and accounted for 13% of the proportion of variance in academic achievement. In Model 3, three predictors including the KADS, influence of friends of different nationalities, and connectedness to fellow students of different nationalities R = .41, F (3, 109) = 7.30, p < .000 changed R^2 from .13 to .17; that is, 17% of predictability of academic achievement can be explained by these three factors. In Model 4, four predictors, including the KADS, influence of

friends of different nationalities, connectedness to fellow students of different nationalities, and involvement with social events off campus explained 20% of predictive variance for academic achievement. Stepwise regression procedure added involvement with student societies at the university as a predictor to the equation and created Model 5. Hence, Model 5 explained 24% of variance of predictability of academic achievement. The influence of students' own efforts was added to the equation as a predictor to create Model 6. Model 6, accounted for 28% of variance in predicting of academic achievement in International students using the six predictors of KADS, influence of friends of different nationalities, connectedness to fellow students of different nationalities, involvement with social events off campus, involvement with student societies at the university, and influence of your own efforts. All these predictors were significant at $p < .000$. The P.P Scatter plot (Figure 10) also showed that the relationship between the above-noted predictors and academic achievement (reported GPA) in International students is linear.

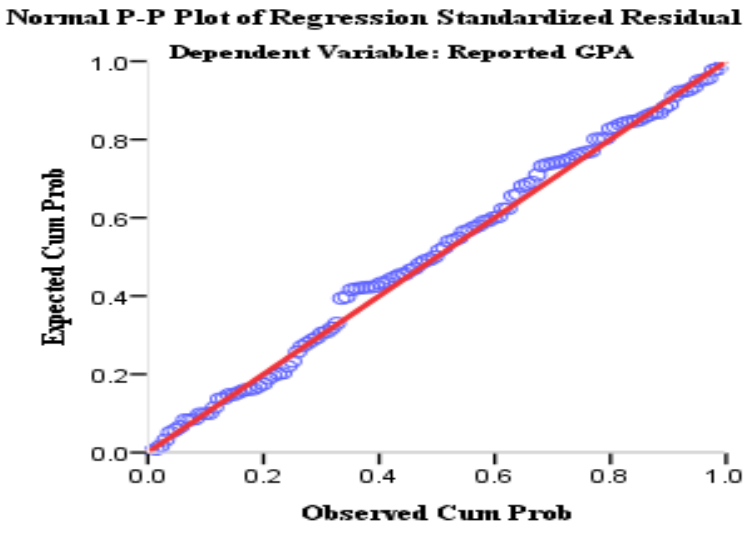


Figure 10: Normal P-P Plot of Regression Standardized Residual for Academic Achievement (Reported GPA) in International samples.

Table 11

The Results of Multiple Regression to Predict Academic Achievement in International Samples

Models	Predictors*	U Beta	S Beta	R	R^2	R^2 change	F
Model 1	Constant	3.22					
	KADS-11**	-0.04	-.30	.30	.09	.09	**10.58*** **
Model 2	Constant	3.48					
	KADS-11	-0.04	-.31	.36	.13	.04	**8.13 *** **
	Influence of friends of different nationalities on AA	-0.13	-.21				
Model 3	Constant	2.99					
	KADS-11	-0.04	-.28	.41	.17	.04	**7.30*** **
	Influence of friends of different nationalities on AA	-0.16	-.26				
	Connectedness to fellow students of different nationalities	0.18	.21				
Model 4	Constant	3.24					
	KADS-11	-0.04	-.31	.45	.20	.03	**6.72*** **
	Influence of friends of different nationalities on AA	-0.14	-.23				
	Connectedness to fellow students of different nationalities	0.19	.22				
	Involvement with social events off campus	-0.12	-.19				
Model 5	Constant	3.16					
	KADS-11	-0.04	-.32	.49	.24	.04	**6.71*** **
	Influence of friends of different nationalities on AA	-0.16	-.26				
	Connectedness to fellow students of different nationalities	0.18	.20				
	Involvement with social events off campus	-0.16	-.26				
	Involvement with student societies at the university	0.13	.22				
Model 6	Constant	2.39					
	KADS-11	-0.04	-.32	.53	.28	.04	**6.91*** **
	Influence of friends of different nationalities on AA	-0.16	-.26				
	Connectedness to fellow students of different nationalities	0.15	.17				
	Involvement with social events off campus	-0.18	-.30				
	Involvement with student societies at the university	0.15	.25				
	Influence of your own efforts on AA	0.23	.21				

*Predictor variables; **Kutcher Adolescent Depression Scale-11; ****p* <.000

Using the analysis of regression for all participants produced five models of prediction (Table 12). In Model 1, the KADS (R = .29, F (1, 402) = 35.54, p < .000) had a significant contribution in predicting academic achievement. In Model 2, the KADS along with loneliness (R = .33, F (2,401) = 24.42, p < .000) changed R^2 from .08 to .11, p < .001 accounting for 11% of the variability of academic achievement. In Model 3, three predictors (KADS, Loneliness scale, and connectedness to parents) predicted (R = .36, F (3, 400) = 19.77, p < .000) 13% of variability of academic achievement. For Model 4, 14% (R^2 = .14, p < .000) of the variance was accounted for using the four variables of the KADS, Loneliness scale, connectedness to parents, and connectedness to faculty in own department. Model 5 added the variable of influence of personal efforts on academic achievement and together with the previous factors, this model could predict 15% of variability of academic achievement. The P.P Scatter plot (Figure 11) also showed that the relationship between the above-noted predictors and academic achievement (reported GPA) in overall sample is linear.

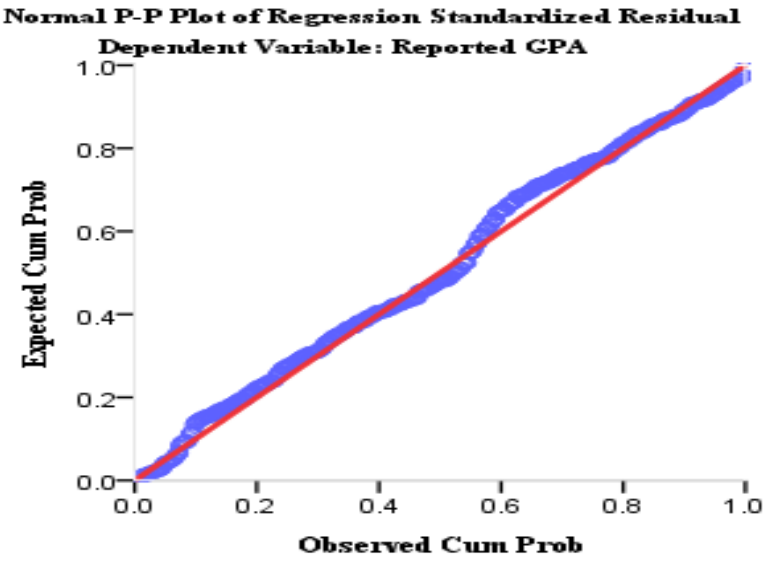


Figure 11: Normal P-P Plot of Regression Standardized Residual for Academic Achievement (Reported GPA) in Overall Sample.

Table 12

The Results of Multiple Regression to Predict Academic Achievement in Overall Samples

Models	Predictors*	U Beta	S Beta	R	R^2	R^2 change	F
Model 1	(Constant)	3.32					
	KADS-11**	-0.03	-.29	.29	.08	.08	**35.54*** **
Model 2	(Constant)	4.04					
	KADS-11	-0.03	-.23	.33	.11	.03	**24.42*** **
	UCLA Loneliness Scale	-0.02	-.18				
Model 3	(Constant)	3.38					
	KADS-11	-0.02	-.21	.36	.13	.02	**19.77*** **
	UCLA Loneliness Scale	-0.02	-.17				
	Connectedness to parents	0.16	.15				
Model 4	(Constant)	3.16					
	KADS-11	-0.02	-.20	.38	.14	.01	**16.70*** **
	UCLA Loneliness Scale	-0.02	-.17				
	Connectedness to parents	0.16	.14				
	Connectedness to faculty in own department	0.08	.12				
Model 5	(Constant)	2.82					
	KADS-11	-0.02	-.19	.39	.15	.01	**14.24*** **
	UCLA Loneliness Scale	-0.06	-.18				
	Connectedness to parents	0.15	.13				
	Connectedness to faculty in your department	0.08	.12				
	Influence of your own efforts on AA	0.10	.09				

*Predictor variables; **Kutcher Adolescent Depression Scale-11; ***$p < .000$

Research Question 8: Which of the proposed path models can adequately identify the suitable paths through which the variables create the maximum likely association and maximum effect size in academic achievement?

A covariance matrix as an input and maximum likelihood estimation was used to provide a comprehensive picture of the nature of the associations between the exogenous and endogenous variables. To augment this process, a path analysis was conducted to analyze the interactions among all major variables (measures of depression, loneliness, maladaptive and adaptive self-regulation, and academic achievement). Path analysis helped to break down

correlations into different pieces for interpreting the effects of the variables of interest. These pieces are a) direct effect due to the path from X to Y, b) indirect effect due to paths through intermediate variables, c) unanalyzed due to correlated exogenous variables, d) spurious due to third variable effects (Smith, 2011). Before using path analysis, the major assumptions of this method were examined as following:

Exploring the assumptions of path analysis

1) *Dependent (criterion) variable should be continuous and normal*: To assess this assumption, a histogram and P-P plot of standardized residuals were used (Figure 12 and 13). The residual is the difference between expected and actual values, and the standardized residual is the residual divided by standard error (Kellar & Kelvin, 2013, as cited in Pennell, 2017). Based on this assumption the histogram of standardized residuals should be similar to a bell curve, and the P-P plot of standardized residuals should be like a straight line. Both Figures (Figures 12 and 13) showed that this assumption was not violated in this study.

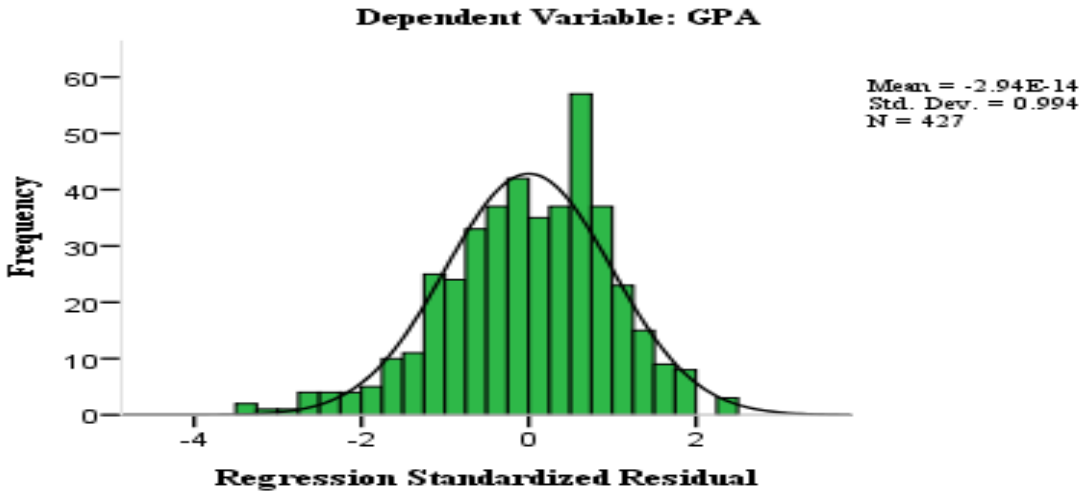


Figure 12: Histogram of Regression Standardized Residual for the Endogenous Variable GPA.

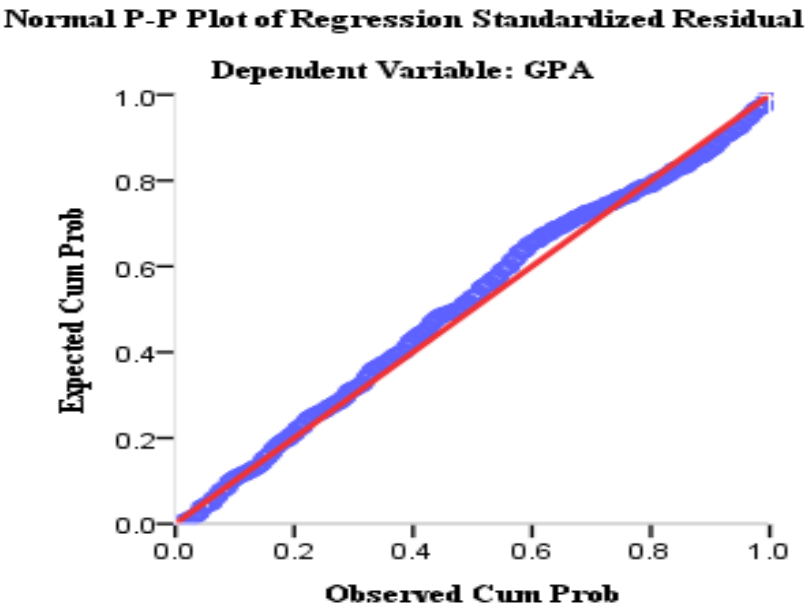


Figure 13: P-P Plot of Regression Standardized Residual for the Endogenous Variable GPA

2) *Assumption of a representative sample*: Path analysis has been used in both random sampling, (which is sometimes cost prohibitive, time-consuming, and impractical) and nonrandom sampling such as convenience or ad hoc sampling (Beshlideh, 2012; Gasemi, 2012; Kline, 2011). Random sampling usually ensures researchers that their samples may be representative. Although there are different definitions of representativeness (Gobo, 2004; Ramsey & Hewitt, 2005; Warren, 2004), the concept of representativeness usually refers to the degree to which samples' characteristics are not very different from the characteristics of a target population (Tenenbaum & Griffiths, 2000; Memon, Ting, Ramayah, Chuah, & Cheah, 2017). Tenenbaum and Griffith (2000) explained representativeness based on the similarity between samples and population; that is, "an observation *d* is representative of a category or process *h* to the extent that it is similar to the set of observations *h* typically generates" (p. 2). Accordingly, in addition to this fact that path analysis has been used in numerous studies with convenience

samples (Beshlideh, 2012; Gasemi, 2012; Kline, 2011; Peterson, & Merunka, 2014), this research was also focused on the degree to which the current samples were not very different from the defined student population of MSVU. Of diverse ways to determine such differences, the current research was focused on *sampling error* as Ramsey and Hewitt (2005) suggested for examining the differences/similarities (representativeness) between samples and the target population.

Sampling error is a theoretical concept that is quantified by standard error (SE) (Sedgwick, 2015), and it should be a small value to show the representativeness of samples (Bhattacherjee, 2012; Heiman, 2011). Accordingly, standard error and the margin of error (*MoE*) were calculated to examine whether the samples were not very different from the student population of MSVU. To do this, $SE = SD/\sqrt{N}$ and *MoE* = *SE* x *Z* score at $Z = 1.96, p \leq .05$ were used (Table 13). Moreover, the interval confidence of the mean of GPA $[\bar{x} \pm z_{\alpha}/2 \cdot \frac{\sigma}{\sqrt{(n)}}]$ was calculated at 95% confidence level to have an estimation of the mean of GPA for the student population of MSVU. The results showed that the standard error for the mean of reported GPA is *SE* = .03 and the margin of error for *Z* = 1.96 is *MoE (Z*= 1.96*)* = .05.

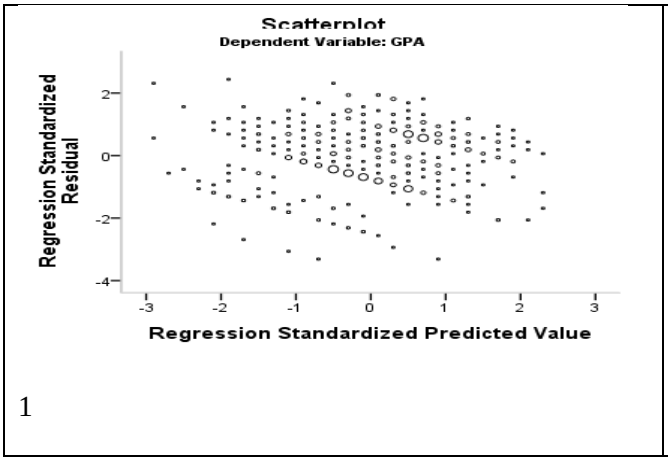
These results indicated that the standard error of the samples (*SE* = .03) and the margin of error (*MoE* = .05) are small enough based on Bhattacherjee's (2012) and Heiman's (2011) views and can be accepted to perform the analysis. Additionally, the interval confidence of the mean of GPA showed that with 95% confidence the GPA mean of the student population of MSVU may be between the interval of 3.04 and 3.16. The sample GPA mean in this study is ($\bar{x} = 3.10$). However, the current study has some limitations with this assumption that were discussed in the Chapter V

Table 13

Descriptive and Analysis of Sampling Error

Samples' Indexes for the Criterion (Dependent)Variable (Reported GPA)		Statistics	Std. Error of Mean
Number of Samples		427	
GPA Mean		3.10	.03
95% Confidence Interval for Mean	Lower	3.04	
	Upper	3.16	
Median		3.1	
Std. Deviation		.66	
Variance		.44	
Skewness		-.57	.12
Kurtosis		.13	.24
Margin of Error, Z = 1.96		.05	

3) *The assumption of homoscedasticity*: This assumption is not violated when the endogenous variable displays similar variance across all values of the exogenous variable (Pennell, 2017; Hooman, 2010; Beshlideh, 2012). Through using residual scatter plots of ordered residuals created by SPSS version 24, the assumption of homoscedasticity was met (Figure 14). Each plot indicated that the dataset was unsystematically distributed.



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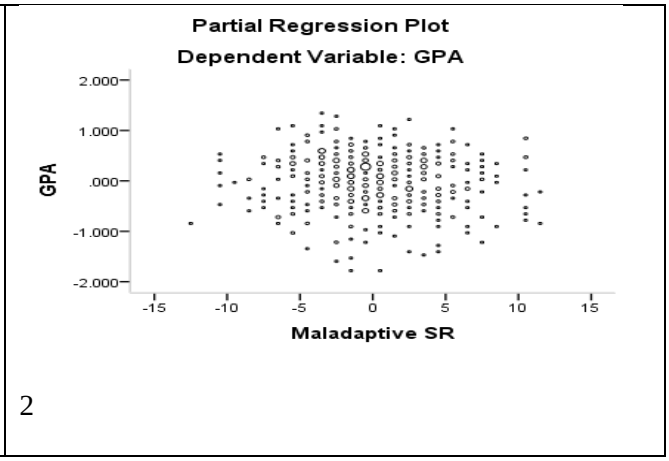

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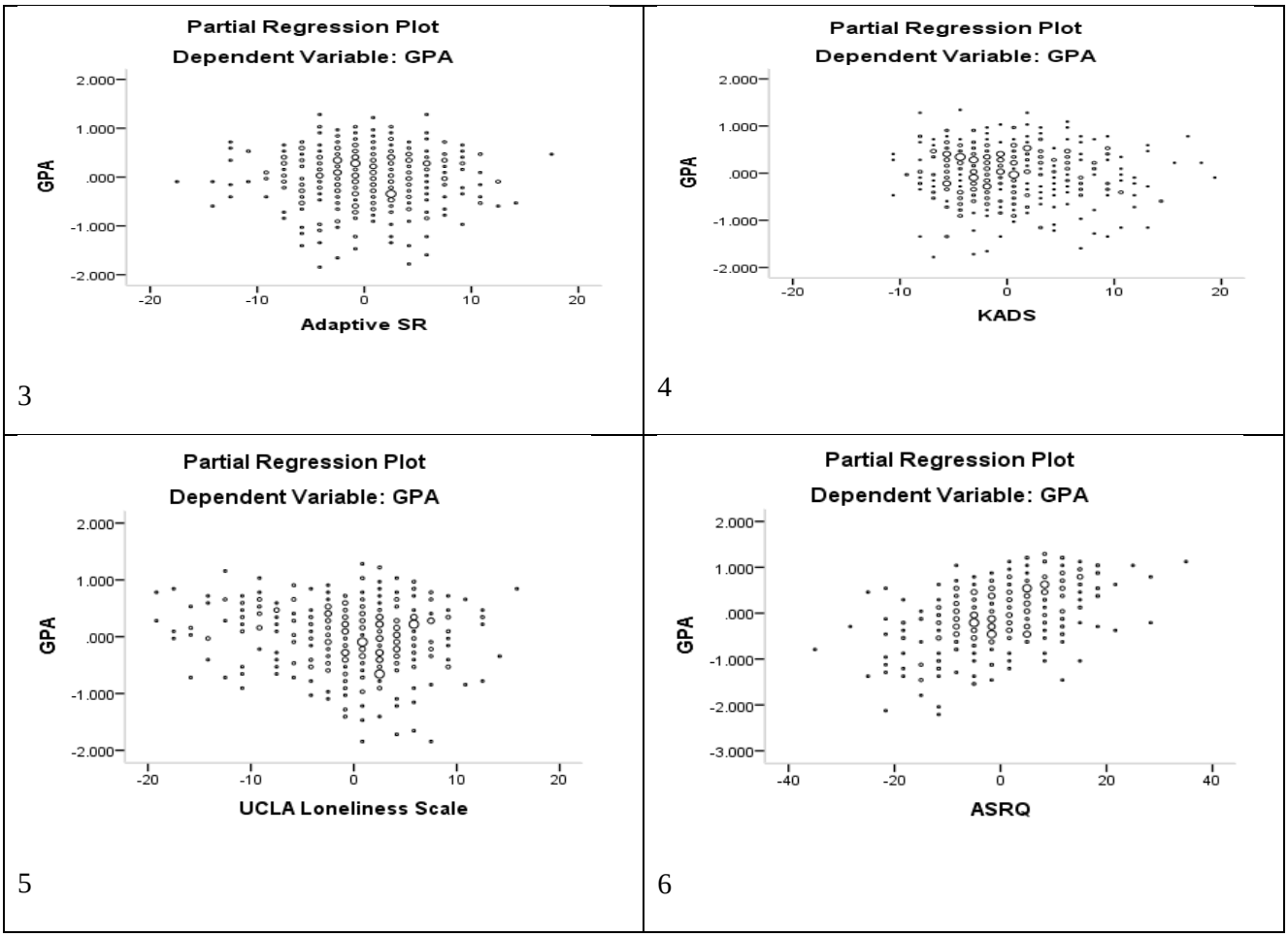

Figure 14: Partial Regression Plots for Dependent (Criterion) Variable GPA (1), and Exogenous (Predictor) Variables Including Maladaptive Self-Regulation (2), Adaptive Self-Regulation (3), KADS-11 (Depression) (4), UCLA Loneliness Scale (5), and Academic Self-Report Questionnaire-ASRQ (6).

4) *Assumption of absence of multicollinearity***:** Multicollinearity is a violating factor whenever two or more of the independent (predictor) variables have very high correlation usually $r > .85$, that is not real. Hence, the data should be free of redundant correlation; otherwise, the data will have biases (Pennell, 2017; Kumar Paul, 2014). Table 14 shows that the variance inflation factor (VIF) for all variables is near to 1 and no variable exceeded the tolerance of < .01indicating that the assumption was not violated.

Table 14
Collinearity Statistics for all Major Variables

	Collinearity Statistics	
Variables	Tolerance	VIF*
KADS**	0.89	1.127
UCLA Loneliness Scale	0.72	1.387
Maladaptive SR	0.65	1.530
Adaptive SR	0.73	1.375
Reported GPA	Not applicable	

* Variance inflation factor; ** Kutcher Adolescent Depression Scale

Other assumptions of path analysis such as intervallic variables and nonspurious relationship were not violated since all major variables are continuous and the causal interpretation was not undertaken in this research.

Path Models

After exploring the major assumptions of path analysis, three hypothetical mediational models were explored via IBM SPSS AMOS-18 (Analysis of Moment Structures). In the first model, adaptive and maladaptive self-regulation as the mediators of the effects of both loneliness and depression on academic achievement were explored. In the second model, loneliness as the mediator of the effects of depression, maladaptive and adaptive self-regulation on academic achievement was explored. In the third model, depression as the mediator of the effects of loneliness, maladaptive, and adaptive self-regulation on academic achievement was explored. In each of above-mentioned models, all variables were represented by their single indicator scores and random measurement error was reduced by adjusting the unique variance of each variable at

1- α. The results of path analysis, including major indices of model fit, and β coefficients for all three models are presented in the Table 15 and 16, Figure 15, 16, and 17.

Table 15
β Coefficients for all three Models

Models	**Variables[a]**			**Estimate (β)[b]**	**SE [c]**	**C.R. [d]**	**P*** **
Model 1							
	Adaptive SR	<--	TKADS	.061	.050	1.22	.222
	Maladapt SR	<--	TKADS	.112	.041	2.36	**.018**
	Adaptive SR	<--	TUCLA	-.186	.042	-3.69	***
	Maladapt SR	<--	TUCLA	.307	.035	6.44	***
	GPA_1	<--	TKADS	-.222	.005	-4.57	***
	GPA_1	<--	TUCLA	-.162	.005	-3.16	.002
	GPA_1	<--	Adaptive	-.011	.005	-.239	.811
	GPA_1	<--	Maladapt	-.037	.006	-.744	.457
Model 2							
	TUCLA	<--	Adaptive	-.345	.054	-7.62	***
	TUCLA	<--	Maladapt	.436	.063	9.42	***
	TUCLA	<--	TKADS	.227	.050	5.38	***
	GPA_1	<--	Adaptive	-.028	.005	-.610	.542
	GPA_1	<--	TKADS	-.225	.005	-4.66	***
	GPA_1	<--	TUCLA	-.177	.005	-3.60	***
Model 3							
	TKADS	<--	Adaptive	.003	.054	.049	.961
	TKADS	<--	Maladapt	.113	.065	2.01	**.044**
	TKADS	<--	TUCLA	.280	.044	5.37	***
	GPA_1	<--	Adaptive	-.028	.005	-.610	.542
	GPA__1	<--	TUCLA	-.177	.005	-3.60	***
	GPA_ 1	<--	TKADS	-.225	.005	-4.66	***

[a] Variables: Adaptive Self-Regulation; Maladaptive SR, Maladaptive Self-Regulation; GPA_1, Reported Grade Point Average; TUCLA, Total Score of Loneliness Scale; TKADS, Total Score of Kutcher Adolescent Depression Scale.
[b]**:** β, Coefficients**,** [c] :SE, Standard Error**,** [d] :C.R, Critical Ratio,
*** $p < .000$,

Table 16
Major Indices of Model Fit

Models	Chi-Square	DF	P	RMR	GFI	AGFI	TLI	CFI	RMSEA
Model 1	122.33	1	.000	3.722	.909	-.362	-3.358	.564	.534
Model 2	.415	1	.519	.021	1.000	.994	1.021	1.000	.000
Model 3	.415	1	.519	.021	1.000	.994	1.021	1.000	.000

Abbreviations: df, Degree of Freedom; P, Probability Value or Asymptotic Significance; RMR, Root-Mean-Square-Residual; GFI, Goodness-of-Fit; AFFT, Adjusted Goodness-of-Fit; TLI, Tucker-Lewis Index; CFI, Comparative Fit Index; RMSEA, Root-Mean-Square Error of Approximation.

Model 1

The result of the analysis of Model 1 is shown in Tables 15 and 16, and Figure 15. The result (Table 16) indicated that the model was not adequate: $x^2(1, N = 427) = 122.33$ and $p < .000$. Although *GFI* = .909 is close to 1, showing good fit, other indices *RMR*= 3.722, *AGFI* = -.362, *TLI* = - 3.358, *CFI* = .564, and *RMSEA* =.534 demonstrated that the model is not acceptable (see Appendix 8 for the acceptable limits of indices). Thus, this model cannot explain the indirect effects of loneliness and depression on academic achievement when adaptive and maladaptive self-regulation are taken into account as mediators. Figure 15 also shows the same results. That is, depression (β = -.22, p < .000) and loneliness (β = -.16 p < .002) have a direct impacts on academic achievement (GPA) meaning that students with high levels of depression and loneliness show lower levels of academic achievement. However, when adaptive and maladaptive self-regulation were entered as moderators into the equation, the effects of depression and loneliness on academic achievement lost their effects.

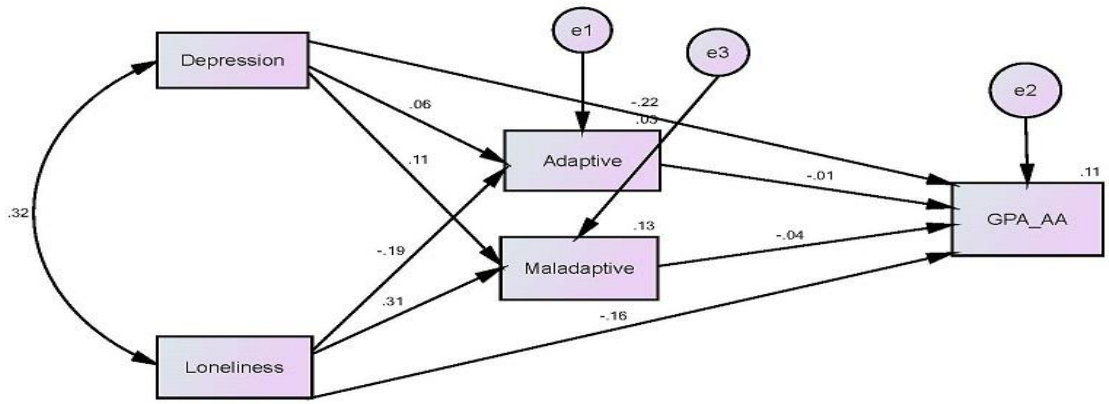

Figure 15: Mediational Model 1 for Adaptive and Maladaptive Self-Regulation as Mediators of the Paths from Depression and Loneliness to Academic Achievement (GPA_AA). Unidirectional Paths are Standardized β Coefficients; Bidirectional Path is Bivariate Correlation.

Model 2

The results of the analysis of Model 2 are shown in Tables 15 and 16, and Figure 16. Results of this model fit indicated that the model is adequate: $x^2 = (1,\ N = 427) = 0.415$ and $p > .519$. Furthermore, other indices of the model fit including *RMR*=.02, *GFI* = 1, *AGFI* = 0.994, *TLI* = 1.021, *CFI*=1, *RMSEA* = .000, indicating that Model 2 is a perfect fit. The β coefficients of variables in this model are shown in Figure 16. As the Figure 16 reveals, depression has a direct effect on academic achievement (β = -0.23, p < .000). Also, depression, maladaptive, and adaptive self-regulation have indirect effects on academic achievement when loneliness was taken into account as a mediator (β = -0.18, p < .000). This means that all three variables (depression, maladaptive, and adaptive self-regulation) can explain academic achievement indirectly through loneliness and that 11% of the variation of academic achievement can be explained by the exogenous variables (depression, maladaptive, and adaptive self-regulation) using loneliness as a mediator.

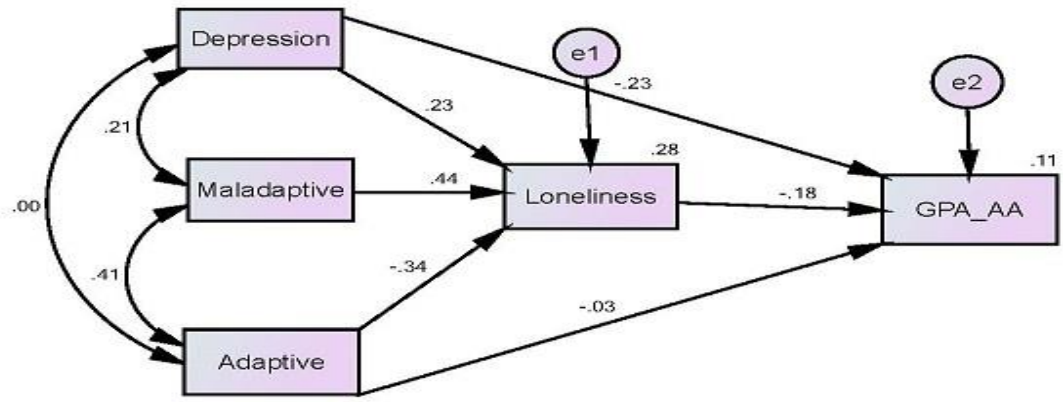

Figure 16: Mediational Model 2 for Loneliness as a Mediator of the Paths from Depression and Adaptive and Maladaptive Self-Regulation to Academic Achievement (GPA_AA). Unidirectional Paths are Standardized β Coefficients; Bidirectional Path is Bivariate Correlations.

Model 3

The results of the analysis of Model 3 are shown in Tables 15 and 16, and Figure 17. As Tables 15 and 16 show, all indices of the fit for Model 3 are the same as the indices for Model 2, indicating that the model fit supported Model 3 perfectly. However, this similarity led the researcher to focus on the β coefficients of each model to differentiate the most explanatory model. Based on the results shown in the Figure 17 and the Table 15, loneliness, adaptive, and maladaptive self-regulation have more indirect effects on academic achievement when depression was taken into account as a mediator (β = -0.23, p < .000). This result demonstrated that the mediating effect of depression is higher than the mediating effect of loneliness in the explanation of academic achievement in this research. Collectively, loneliness, maladaptive self-regulation, and depression accounted for 11% of the variance in academic achievement.

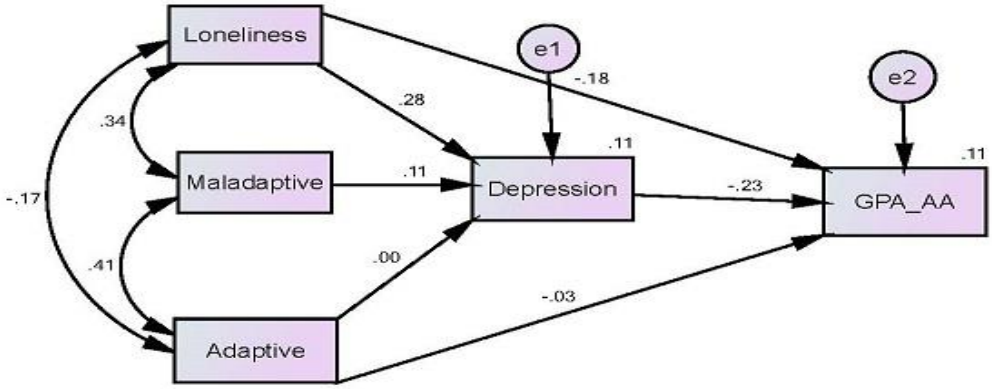

Figure 17: Mediational Model 3 for Depression as a Mediator of the Paths from Loneliness and Adaptive and Maladaptive Self-Regulation to Academic Achievement (GPA_AA). Unidirectional Paths are Standardized β Coefficients; Bidirectional Path is Bivariate Correlations.

Chapter V: Discussion and Implications

Research presented in the literature review showed that there were several disparities in previous studies regarding the relationships among the contributing factors (e.g., depression, loneliness, self-regulation, university involvement, and social connectedness) and academic achievement in university students. These disparities focused on the lack of studies on the reciprocal relationships, predictive, and mediating roles of these contributing factors in students' academic achievement. Such disparities were obvious when the literature about International students was scrutinized. There were few studies dealing with the differences between International and Canadian students in terms of depression, loneliness, self-regulation, social connectedness, university involvement, relational influencers, and gender roles. With limited research in this area, university administrators and education policy makers lack evidence-based information to develop programs and effective strategies to enhance students' academic achievement, on-campus social connectedness, and academic involvement. Without such knowledge of possible mental health practitioners, local psychologists, social workers, and psychiatrists would encounter difficulties in providing intervention and supporting students.

Given that International students now make up at least 12% of the students at Canadian universities (Canadian Bureau of International Education - CBIE/BCEI, 2018) and since the rate is expected to increase in next few years locally and globally (Global Leading Higher Education Marketing Company, 2019), universities need to be prepared to provide an appropriate university experience for these students. Therefore, the purposes of the current study was to explore the possible differences between International and Canadian students in terms of above-noted factors. Additionally, students' connectedness to parents, family, faculty, friends, and community, and university involvement in academic achievement were examined. The results of

this research are discussed in the present chapter along with some possible psychological and educational suggestions to address policy and programming.

Influencers of Academic Achievement

As the results showed, both International and Canadian samples perceived parents and personal effort as moderately or very important influencers to their academic achievement. Cheng-Chuan, Yusof, and Mohd-Shah (2013) also noted the high impact that parents had on their adult child's academic achievement. Similarly, Canadian, and International students rated parental influence (84.4 % Canadian and 82.5% Internationally) and personal effort (97.4% Canadian and 95% International) as moderately or very important in influencing academic achievement. While 25.6% of Canadian and 29.2% of International students live with family members or siblings, only 26.1% of Canadians and 10% of International students were living with their parents. Such an arrangement may have resulted in less in-person communication between students and their parents and replaced it with some other types of communications (e.g., phone, e-mail, or text messaging). Kiyama et al. (2015) stated that such types of communication may negatively affect students' performance since it may reduce parents' interest, support, and involvement in their academic performance.

Both Canadian and International students indicated that their professors also influenced their academic achievement. Overall, 78.2% of Canadian and 77.1% of International students reported that professors had a moderate to high influence on their academic achievement. Previous research in this area has focused more on professors' role in creating positive or negative classroom climate (Boesch, 2014), or student-faculty interactions (Wang & Lorenz, 2018).

Levels of Involvement

Student involvement can be defined as the quantity and quality of engagement in various university activities such as participation in on-campus extracurricular activities or off-campus activities (e.g., sports, fitness and recreational activities) in which they invest their physical and psychological energy (Astin, 1999; Chong Abdullah, HC, Roslan, & Uli, 2015). The results of the current study revealed that the level of student involvement in sports, fitness, off campus social events, artistic/creative, and recreational activities did not differ in terms of citizenship.

Both International and Canadian students reported low levels of involvement in the above-noted activities. These findings aligned with the results of surveys conducted with 8549 university students in 2011 and on 14760 university students in 2018 by the Canadian University Survey Consortium, (CUSC) (2011, 2018). The surveys (CUSC, 2011) demonstrated that the level of involvement was between 5% and 18% for different activities such as student government, clubs, and on-campus student recreational and sports programs, and cultural events. However, the current research showed that International students were significantly more involved in student activities on campus such as student council (4.2% versus 20.8%), campus social events (21.2% versus 35.8%), and international activities (7.2% versus 33.3%) than Canadian students. This may be because more of the International students live on campus or are making attempts to become involved in the university experience. It may also reflect disengagement on the part of Canadian students and a feeling that international activities are for International students not them. Following up on this issue with a more in-depth survey or interviews should provide insight into why some students are more involved than others.

As well as the degree of student involvement in different on-campus and off-campus activities, the relationships among involvement in these activities and scores on the depression, loneliness, self-regulation, and academic achievement measures were examined. For Canadian students, the results indicated that involvement in off-campus social events had a negative associated with students' sense of loneliness. This finding is in line with those of other studies that indicated social participation provided an opportunity for social interactions and for reducing loneliness (Diehl et al., 2018; Masi et al., 2011; Phillips, 2019). The results also revealed that participating in recreational activities was positively associated with academic performance in Canadian students. This finding supports Aaltonen et al.'s (2016) research results that indicated leisure-time physical activity had positive and long-term effects on academic achievement. Also, the result aligned with Slade and Kies' (2015) findings that indicated a decrease in recreational activities could lead to a decrease in exam scores for medical students.

However, unlike other studies in which involvement in sports had a positive effect on academic achievement (Bradley, Keane, & Crawford, 2013), the current research did not support this finding for International students. Nevertheless, the current research showed that only participating in international activities had a negative effect on maladaptive self-regulation for International students.

Generally, there were some worthwhile points from these results. First, International and Canadian students showed different types of involvement that affected their sense of loneliness, self-regulation, and academic achievement. This aligned with Astin's (1999) theory of student involvement in higher education. Based on this theory, "…different students manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times" (p. 519). When all participants were

examined as a group, only involvement in international activities had a significant affect. This type of involvement was negatively associated with maladaptive self-regulation and loneliness, and positively associated with adaptive self-regulation. This result aligned with other studies in which student involvement had a positive effects on psycho-social development (Foubert & Grainger, 2006).

In addition, the current research demonstrated that participating in off-campus social events and involvement in student societies, along with other variables, had a significant effect in predicting academic achievement for International students. Also, general results related to the degree of on-campus and off-campus involvement showed that most students (55% or more) were not or only somewhat involved in different social activities. Similar results were found in larger surveys (CUSC, 2011, 2018), pointing to the need to identify the reasons behind the lack of involvement and address them.

Levels of Connectedness

Connectedness is characterized as a subjective psychological bond with others (Hare-Duke, Dening, Oliveira, Milner, & Slade, 2019), a sense of being interrelated and close with others (Foster et al., 2017), or as a relational schema with a sense of belonginess (Satici, Uysal, & Deniz, 2016). Classifying connectedness as social and institutional based on Jorgenson, Farrell, Fudge, and Pritchard's (2018) view, students' social and institutional connectedness were examined in both groups of samples. Results revealed that both Canadian and International students have social connectedness to parents, siblings, and extended family members, and the community. As well, both groups showed institutional connectedness to fellow students of same and different nationality, the university at whole, programs, and faculty in their own department. Canadian students were more connected to both friends of same and different nationality

compared to International students. Conversely, the International students were more connected to faculty in other departments than faculty of their own departments.

The conceptual framework identified by Hare-Duke et al. (2019) can be considered when looking at social connectedness. This framework has five dimensions including closeness, identity and common bond, valued relationships, involvement, cared for, and accepted for interpreting social connectedness (Hare-Duke et al., 2019). If the dimension of involvement is seen as a major component of social connectedness then International students appear to be less connected to their family (parents, siblings, and other relatives) because they were far from them and less involved in family and community matters. In actuality, the current results showed that international students, like their Canadian counterparts, have a sense of connectedness to parents and family members. This similarity may indicate that connectedness is more a subjective sense than functional matter, and it is less affected by distance.

Comparing students' reported levels of involvement in on-campus activities with their reported levels of connectedness to the university (including faculty, program, and fellow students) revealed that the level of involvement is not always related to social and institutional connectedness. Considering social connectedness as a subjective sense, this difference may show that a student can feel very connected to a community or university but not be involved in on-campus activities. This not only aligned with Astin's (1999) theory of involvement, but also indicated that the sense of connectedness is more subjective than functional as it was argued in relation to connectedness to parents.

Surprisingly, International students had a greater level of connectedness to faculty of other departments than Canadian students. This difference was not previously reported in the

literature, and it needs further research. However, as Jorgenson et al. (2018) noted, it may be related to student-professor relationships, students' expectations, or cultural differences.

Aside from the degree of social and institutional connectedness, the associations among social connectedness and the contributing factors (depression, loneliness, self-regulation, and academic achievement) in both groups of samples were examined and resulted the following differences and similarities.

Connectedness and Measures of Depression, Loneliness, Self-regulation, Academic Achievement

Depression and connectedness: Depression as a pattern of dysregulation in the brain functions (Kutcher & Chehil, 2009) can affect different types of personal, educational and social functions in people. Similar to Mojs et al.'s (2013) study, in which KADS was used, the current research showed that depression was not high in both Canadian and International students. However, their depressive symptoms were associated with their levels of connectedness. In detail, the results indicated that in Canadian students, the sense of connectedness to friends of the same and different nationality, fellow students of the same and different nationality, and community were negatively associated with their scores on the KADS (depression scale). That is the more sense of social and institutional connectedness, the less sense of depression in Canadian students.

Unlike the Canadian students, the KADS scores for International students were negatively associated with a sense of connectedness to siblings and friends of different nationality. Since a number of International students were living with their siblings and have more than three siblings, it seems that living with ones siblings helps offset feeling of depression.

Both groups demonstrated that connectedness to friends of different nationality was negatively associated with depression. Overall students' scores on the KADS had negative associations with connectedness to parents, siblings, family, friends, fellow students, and community. Generally, these findings aligned with Marroquín's and Nolen-Hoeksema's (2015) research in which social connectedness (to friends) was seen as reducing the deleterious effects of depressive symptoms. The findings also aligned with the work of Foster et al.'s (2017) and Townsend and McWhirter (2005) in which family/parent and school connectedness were associated with lower scores on depression scales. Similarly, such findings supported Putnam's (2000) and Peng's (2009) studies in which the sense of belongingness and connectedness were negatively associated with mental health problems. It seems that these findings may crystalize the *social capital theory* in which social ties are related to mental health (Peng, 2009). Based on this theory, interactions with others have significant implications for physical and mental health (Peng, 2009; Ward & Zabriskie, 2011; Beresford, Nettle, & Perring, 2010).

Loneliness and connectedness: Loneliness as an unpleasant experience, which is usually characterized by social isolation or reduced social relationships quantitatively or qualitatively (Ge, Yap, Ong, & Heng, 2017), was at the moderate to high levels in both Canadian and International students. Examining the relationships between different types of connectedness and the sense of loneliness revealed that only connectedness to programs of study had a negative association with loneliness for International students. Whereas, for Canadian students, connectedness to parents, family, friends of same nationality, fellow students, and community were negatively associated with loneliness. As the results for all participants were similar to those for the Canadian students, it may be that the smaller number of International students generated these differences. Generally, these findings aligned with the findings of Townsend and

McWhirter (2005) that indicated poor social connectedness was associated with a sense of loneliness. Social connectedness, as posited by Satici et al.'s (2016) has a high negative association with loneliness.

Self-regulation and connectedness: Garnefski and Kraaij (2007, 2008) characterized self-regulation by a set of adaptive and maladaptive strategies that involved in regulating emotions and behaviors in social relationships. Examining those strategies revealed that seventy percent of overall samples were self-regulated at moderate level and none of the different types of social connectedness were related to maladaptive self-regulation positively or negatively. However, when all participants were considered, a sense of connectedness to program of study was shown to have a negative association with maladaptive self-regulation. Examining the linkage between adaptive self-regulation and the types of connectedness showed that adaptive self-regulation can be defined by connectedness to fellow students of same and different nationality. Considering this type of connectedness as social connectedness, this findings is not in line with that of Marroquín's and Nolen-Hoeksema's (2015) research in which maladaptive emotional regulation was negatively linked with social connectedness and had no link to adaptive emotional regulation.

Academic achievement and connectedness: Previous studies have noted that international and local students are different in their academic achievement (Hamamura et al., 2006, 2008; Turingan et al., 2009). Some researchers reported that such differences were due to their connectedness with their instructors (Tanaka Matsumi et al., 1976 as cited in Turingan et al., 2009) or due to their sense of friendship with other students (Montgomery, 2010). Results of the current research indicated that Canadian students reported connectedness to parents, fellow students (same and different nationality), and faculty that was positively related to academic

achievement while International students reported a significant connectedness to their program of study. Since data analysis for all participants was very similar to results for the Canadian students, the above-noted differences may be related to the lower number of students in the International group. Generally, the overall results indicated that almost all types of social connectedness were positively associated with academic achievement. These findings aligned with those of Pittman and Richmond's (2007) who noted that a sense of belonging was linked with both students' academic performance and adjustment. Similarly, Montgomery's (2010) and Montgomery & McDowell's (2009) indicated that international students tended to establish a trustworthy meaning of their academic performance or learning from their own perspectives of being embedded in a new social relationship with domestic students. The current study showed that the connectedness to fellow students of different nationality, program of study, and university are associated with students' sense of academic progression.

Depression, Loneliness, Self-regulation, Academic Achievement and Citizenship

Depression, loneliness, and citizenship: Some studies revealed that not only is depression a serious issue among university students (Ibrahim et al., 2013; Iqbal et al., 2015), but that international students tended to be more depressed than domestic students in Western universities (Brunsting, Zachry, &Takeuchi, 2018; Hamaideh, Hamdan-Mansour, 2014). Similar to other studies, the current research focused on students' scores on a measure of depression. In contrast to other research, the current study found no differences between International and Canadian students in their scores on the depression scale. Although students' depression was a significant negative predictor of academic achievement in this study, it was not reported as prevalent or at clinical depression levels by participants. Apart from depression, International students reported being lonelier than Canadian students. This was aligned with previous findings

in which loneliness was prevalent among such students. (Diehl et al., 2018; Shahidi, 2013; Sawir et al., 2008).

Self-regulation (adaptive and maladaptive) and citizenship: Although overall participants in this study were self-regulated at moderate level, some differences were found in terms of citizenship. International students scored slightly higher on adaptive self-regulation strategies than Canadian students. This result was opposite to Hamamura's (2008) findings that claimed people in individualistic societies (e.g., North America) were more self-regulated than people in collectivistic societies. Hamamura (2008) argued that in individualistic societies, being autonomous, having clear boundary between self and others, and preferring personal goals instead of group goals are encouraged. One interpretation of this opposite result may be the fact that International students most likely saw these adaptive self-regulation strategies (e.g., acceptance, positive reappraisal, positive refocusing, refocus on planning, and putting into perspective) as important when trying to adjust to a new university/country. This interpretation is based on the results of contemporary studies that indicated International students tend to either use cognitive strategies (Saravanan, Mohamad, & Alias, 2019) or acculturation strategies (Brunsting, Zachry, & Takeuchi, 2018) to adapt themselves with new culture in host universities. However, both groups of students were approximately in a same level in reporting maladaptive self-regulation strategies.

Academic achievement and citizenship: There was a slight difference between two groups of students relative to academic achievement with Canadian students reported a slightly higher grade-point average (GPA) than International students. However, the results are in line with those of studies in which International students have shown lower academic achievement.

Conversely, Liao's et al. (2012 and McWhirter et al. (2007) found that International students had higher academic achievement than local students.

Depression, Loneliness, Self-regulation, Academic Achievement and Gender

Gender was studied in relation to depression, loneliness, self-regulation, and academic achievement in this research. The findings indicated that there was a significant relationship between gender and loneliness relative to male students. Previous research found that female students were lonelier than male students (Chang, 2018; Mahon, Yarcheski, Yarcheski, Cannella, & Hanks, 2006). In the current research, female students scored lower than male students on the loneliness scale; that is, female students reported being less lonely than male students. This result aligned with the previous research that was conducted at the same institution (Shahidi, 2013). Other studies have found gender to be a distinguishing factor in predicting self-regulation (Haron, Syed-Mustafa, & Alias, 2010), depression (Chang, 2018), and academic achievement (Dayroglu & Türüt-Asık, 2007). There is no significant difference between female and male students in their scores on depression, self-regulation, and academic achievement scales in this population. This result may be an artifact of the university population which, as in the study, is approximately 75% female. It may also be because students who chose to participate feel more connected and confident then those who chose not to participate.

Reciprocal Relationships, Predictability, and Mediating Models

Examining the individual and collective roles of loneliness, depression, self-regulation (adaptive and maladaptive), social connectedness, and university involvement in students' academic achievement produced several findings: First, measures of loneliness and depression had close positive interrelationship with each other in both groups (Canadian and International) as well as overall. That is, changes in students' loneliness were linearly associated with changes

in their depression. This finding was in line with other previous studies (Chang, 2018; Cacioppo & Cacioppo, 2018). Depression was also reported to have a positive association with maladaptive self-regulation. This result showed that students who have higher scores on KADS (depression scale) reported more maladaptive self-regulation strategies (e.g., rumination, and other blame). This finding aligned with previous investigations in which depression was associated with maladaptive self-regulation (Garnefski, Grol, Kraaij, & Hamming, 2008; Kraaij & Garnefski, 2019; Marroquin & Nolen-Hoeksema, 2015).

Third, unlike previous studies that did not directly focus on loneliness in relation to maladaptive and adaptive self-regulation, this research revealed that students who had higher scores on loneliness reported more maladaptive strategies such as self-blame and other blame. Students who reported more adaptive self-regulation strategies scored lower on a measure of loneliness. This association was not found for depression and indicated that positive self-regulation strategies did not show any relationship with depression. This finding may cast doubt on those assumptions that indicated strengthening adaptive self-regulation strategies may reduce the sense of depression (Garnefski, Kraaij, & van Etten, 2005; Garnefski, Legerstee, Kraaij, Kommer, & Teerds, 2002).

Fourth, the current study revealed that all three exogenous factors (depression, loneliness, and maladaptive self-regulation) were negatively associated with students' academic achievement; that is, higher levels of loneliness, depression, and maladaptive self-regulation can result lower academic achievement in Canadian students. This result aligned with previous studies in which lower academic achievement was associated with depression (Hamaideh et al., 2014; Lund et al., 2014), loneliness (Benner, 2011; Grimm, 2007; Zarei et al., 2013), and lower self-regulation or self-regulated learning (Barzegar, 2012; Duru et al., 2014). However, the

association between maladaptive self-regulation and academic achievement was not found for International students.

Finally, unlike previous research in which self-regulation was associated with positive academic outcomes (Blair & Diamond, 2008), the current study demonstrated that there was no relationship between adaptive self-regulation strategies (e.g., acceptance, positive reappraisal, positive refocusing, refocus on planning, and putting into perspective) and students' academic achievement for Canadian and International students. In contrast, the current research demonstrated that using more maladaptive self-regulation strategies (such as catastrophizing and other blame) was associated with lower levels of academic achievement in students.

Predictability of academic achievement

Multiple regression analysis was used to extract and order the variables within several models to uncover the single and collective effect size of predictors while the path analysis extracted the appropriate path models to show the mediating roles of variables and the direct and indirect effects of variables.

The results of current research showed that for Canadian students, academic achievement (self-reported GPA) could be predicted through the measures of loneliness, depression, the degree of involvement in international activities, connectedness to parents, faculty, and community. These predictors could predict 20% of the variability of academic achievement in Canadian students. This finding was in line with other studies in which academic achievement/performance can be predicted through loneliness (Mattanah, Brooks, Brand, Quimby, & Ayers, 2012; Rosenstreich & Margalit, 2015), depression (Mousa et al., 2016), or can be affected by the various types of on-campus or off-campus involvement and social connectedness (Foubert & Grainger, 2006; Gao & Kit Ng, 2017).

For International students, measures of depression, involvement in student societies, off-campus social events, social connectedness to fellow students of different nationality, friends, and their own efforts could predict 28% of variability of academic achievement. These results were in line with the above noted studies and the findings of Naik et al.'s (2017) research. However, when the results for all participants were examined, five predictors including students' scores on the measures of loneliness, depression, connectedness to parents and faculty and students' personal efforts could explain almost 15% of variability of academic achievement.

Using path analysis, three models on how the exogenous factors interact with each other to influence students' academic achievement was obtained. Of three extracted models, Model 3 showed that depression had higher mediating effects in the explanation of academic achievement compared with loneliness and self-regulation in the other models. Accordingly, Model 3 was an appropriate model to explain the paths from loneliness and self-reguation (adaptive and maladaptive) to depression, and from depression to academic achievement. In this model depression lies on a relational pathway mediating among loneliness, maladaptive self-regulation, and academic achievement. Students who reported loneliness and maladaptive self-regulated behaviors were more likely to report poor academic achievement when depression was taken into account as a mediator. The direct relationship between loneliness and depression was demonstrated in this study as well as in previous research (Cacioppo & Cacioppo, 2018; Chang, 2018; Dell, Pelham, & Murphy, 2019; Layden, Cacioppo, & Cacioppo, 2018). Academic achievement was impacted by both depression (Hamaideh et al., 2014; Lund et al., 2014;) and loneliness (Benner, 2011; Grimm, 2007; Quan et al., 2014; Zarei et al., 2013;). As well, the association between depression and maladaptive self-regulation strategies was corroborated by

the current research and previous studies (Garnfeski & Kraaij, 2006; Kraaij & Garnefski, 2019; Marroquin & Nolen- Hoeksema, 2015).

Implications and Recommendations

This study raises several potential implications for a) mental health practitioners, b) university administrators, educators, and educational policy makers, and c) future researchers. .

A) Implications for mental health practitioners

A.1: This study revealed that involvement in international activities apparently reduced the reported sense of loneliness and maladaptive self-regulation behavior in International students. Accordingly, mental health practitioners are encouraged to use this information in their social intervention programs and/or advise International students to become involvement in international activities if they report feeling lonely or using maladaptive self-regulation strategies.

A.2: The differences between Canadian and International students regarding connectedness and its effects on loneliness, depression, and self-regulation should be considered in mental health intervention programs. These differences inform mental health practitioners to direct their intervention programs toward enhancing students' interpersonal relationships and friendship to reduce the sense of loneliness, depression, and maladaptive self-regulation. Also, using various counseling procedures for case relationship management and promoting students' connectedness is recommended.

A.3: Based on the current results, it seems that living with siblings and/or parents can reduce feelings of depression. Although mental health professionals can, when appropriate, focus

on family-based programs to reduce the sense of depression in students, they should also consider alternative programs for such as connectedness to friends.

A.4: In line with previous findings (Blazina, Settle, & Eddins, 2008; Quan, Zhen, Yao, & Zhou, 2014; Shahidi, 2013), this research revealed that International students have a slightly higher sense of loneliness when compared to Canadian students. As well, male participants reported a slightly higher sense of loneliness than female participants. Apparently, being far from their hometown and less involvement in family relationships affected their sense of loneliness. Thus, this research suggests having some special intervention programs to reduce International students' sense of loneliness during their academic journey. Such intervention programs are usually designed based on students' cultural characteristics such as designing cultural artifacts for their New Year or other cultural festival celebration. Also, intervention programs can be developed in terms of other parameters such as involvement in recreational activities or having social meetings with faculty that were investigated in this and other studies. Brunsting, Zachry, and Takeuchi (2018) reported that having more interaction between faculty and international students will increase students' sense of belongingness that, in turn, may influence psychosocial outcomes. Jia and his colleagues (2018) recommended that relevant periodic collective counseling and collective activities for university freshmen, who are experiencing decreased family connectedness, can be useful to reduce their sense of loneliness. Some other intervention programs may be spirituality-based or faith-based health interventions (Gallegos & Segrin, 2018) for International or Canadian students.

A.5: Since this study revealed that maladaptive self-regulation is closely associated with students' loneliness and depression, and because this type of self-regulation is composed of rumination, self-blame, other-blame, and catastrophizing, mental health practitioners are

encouraged to focus on therapeutic methods such as cognitive behavioral therapy that reduce these negative cognitive strategies. The less use of maladaptive self-regulation strategies, the lower sense of loneliness and depression, and better academic function.

A.6: This research revealed that loneliness and depression are closely associated with each other through different paths. The direct effect of loneliness on depression was higher than the direct effect of depression on loneliness. That is, students who suffer from loneliness may experience depressive symptoms in future. Thus, mental health practitioners should prioritize their intervention programs for students who report feelings of loneliness. That is, they should design intervention programs that directly prevent or reduce the sense of loneliness in student populations. Nevertheless, if students' scores on KADS-11 are high, the clinicians should consider working on depression through other methods of diagnosis and interventions.

A.7: Negative association between loneliness and adaptive self-regulation in this research suggested that reinforcing positive self-regulation strategies may work effectively on students' feelings of loneliness. Accordingly, it is recommended to embed positive self-regulation strategies in the body of intervention programs for students who report feelings of loneliness.

A.8: Lower scores on the measure of depression in both groups can be interpreted through Pin's and Chris' (2012) conceptualization indicating that post-secondary students are not typically seen as a 'high need' population in terms of mental health programs. However, clinicians should be aware of the interrelationship among depression, loneliness, maladaptive self-regulation, and students' academic functions. This finding indicates that poorer academic functioning can be maximized by the mediating role of depression. Hence, two steps are recommended: First depression should be assessed through multiple ways such as using self-report scales, clinical interview, and other criteria and tools (e.g., Teen's Functional Assessment

or World Health Organization Disability Assessment Schedule 2.0 - DSM-5, 2013). Second, in cases where GPA is affected, students should be assessed, and interviewed to determine if intervention is needed and at what level.

A.9: This research provided mental health practitioners with a predictive equation to estimate International and Canadian students' academic function separately. Such estimation will give clinicians a measurable and feasible index to trace not only students' functions, but also to track changes in students' academic function after using therapeutic interventions. The equation is $\acute{Y} = a + (b1 \times X1) + (b2 \times X2) + (b3 \times X3)$. In this equation a is constant value, b is unstandardized coefficient, and X is the person's scores on the related scales. If it is necessary to predict a student's academic achievement through his or her scores on all measures the model 6 should be used.

B) Implications for university administrators, educators, and educational policy makers

For Canadian universities to remain competitive and attract more International students, it is pivotal that university administrators, educators, and educational policy makers put more effort into understanding how International students experience their academic journey, what types of needs they feel, and how they are different from Canadian students. Fortunately, the results of this research can be used to promote academic performance and mental health in both Canadian and International students.

B.1: As the results showed, 84.4% of Canadian and 83.5% of International students reported that their parents were moderately or very influential to their academic achievement. Both groups of students (over 95%) also noted the importance of their own personal effort for

academic success. Universities and others need to capitalize on these relationships. The university should use social media to engage parents and encourage them to stay connected and involved in their adult child's education. Engaging with the positive roles of parents through setting various on-campus events out such as workshops or networking may be effective for students' educational performance. For example, inviting Canadian students' parents in first year-orientation and continuing such social meetings periodically may be helpful to have more engagement. Likewise, acknowledging student's efforts, encouraging a well-balanced lifestyle, and offering opportunities for on-campus socialization may promote a sense of belonging.

B.2: This study showed that less than 40% of all students reported a sense of connectedness to faculty in their own programs. Low connectedness to such faculty might have an impact on academic achievement. Suggestions to improve connectedness include cooperative learning activities, learning through social meetings, having intercultural dialogue in courses, providing collaborative/teamwork-based leadership programs, and having social events. (Brunsting, Zachry, & Takeuchi, 2018). Connective instruction (Martin & Dowson, 2009 as cited in Burns, Martin, & Collie, 2018) is another appropriate approach to enhance faculty-student connectedness. In this approach, faculty can try to connect to students via personal (e.g., respecting diversity and pedagogical (e.g., clear, thoughtful, structured communication) channels.

B.3: The results of this research revealed that International and Canadian students at MSVU differed on the measured psycho-educational factors such as their involvement and connectedness to faculty and university. Therefore, university administrators and faculty need to understand the uniqueness of both International and Canadian students as a part of university population. Understanding should be reflected in the ways faculty and educators work with

students. Such ways might be adopting classroom practices, using cooperation of fellow students of the same and different nationalities, and debating cultural differences with respect to their cultural sensitivity.

C) Implications for future research

The current research raised some suggestions for future research.

C.1: Although previous research examined the degree to which loneliness and depression are two separate phenomena (Cacioppo et al., 2006; Cacioppo et al., 2009; Cacioppo & Cacioppo, 2018), it is presumed that depression, self-regulation, and loneliness might not be independent from each other and might belong to a single domain. Thus, further studies could focus on the latent structure of these variables to reveal the extent to which they are dependent to a single domain.

C.2: As it was mentioned the current study showed that the International students reported a sense of connectedness to faculty in other programs compared with faculty in their programs. This finding needs further research through using focused group method or other qualitative methodology.

C.3: Although both groups showed low levels of involvement in on-campus and off-campus activities and these results were roughly similar with the findings of the Canadian University Survey Consortium (2018), not all types of on-campus and off-campus are related to students' academic achievement. Some researchers believed that International students' involvement in programs of study and extracurricular programs that are very close to the content of their programs of study could enhance students' performance compared with other types of involvement (Naik et al., 2017). Thus, future researchers should focus on the different types of

activity or involvement and their effects on academic achievement. For example, since participating in student council is related to better academic achievement, future researchers should focus on mechanisms through which such student societies affect their academic performance.

C.4: Although the current research revealed that male students scored slightly lower than female students on a measure of loneliness, it is recommended that further investigations focus on the ways students cope with the sense of loneliness. This can be addressed by gender, citizenship, and other diversity factors. Such studies can provide additional information that may improve mental health intervention programs.

C.5: This research revealed that loneliness and depression have different effects on each other in student samples. Previous research also displayed that these are two distinct psychological phenomena naturally (Dell et al., 2019; Cacioppo et al., 2006, Cacioppo et al., 2009). Further research can provide future researchers with an opportunity to study the possible components that distinguish them from each other and the components they have in common. Additionally, researchers can look at how changes in these components can alter the levels of both loneliness and depression in different population.

C.6: This research revealed that reported positive self-regulation strategies had no relationship with depression. This finding contradicted previous research in which positive self-regulation strategies were negatively associated with depression (Garnfeski & Kraaij, 2006; Kraaij & Garnefski, 2019; Marroquin & Nolen-Hoeksema, 2015). Thus, further research is needed to clarify such contradictions.

C.7: This multi-variable research illuminated how students' academic achievement may be affected directly or indirectly by loneliness, depression, and maladaptive self-regulation. Further research is needed to study other types of influencers such as gender and language to gain a more comprehensive perspective about variables that impact academic functions in both international and domestic students.

C.8: While a lot of information was gained through the use of surveys/measures, such information did not provide an in-depth perspective on how Canadian and International students perceive their relationships with the university, their families, students, faculty, or the community as it relates to their academic success. Perhaps, individual interviews or focus groups could be used to develop a greater understanding of the issues and challenges facing students and how they perceive they impact their academic performance.

C.9: Given the high percentage of participants who indicated that professors have an impact on academic achievement, it is important to investigate the nature of their influence on students in future studies.

Limitations

1: The results of this study are not fully generalizable to all university students as participants were convenient. Although statistical indexes showed that the samples were not very different from the student population at MSVU, the interpretation of representativeness should be considered cautiously. However, attempts were made to include students from different academic programs and nationalities.

2**:** Interpretation of differences between International and Canadian students on the various measures should be made cautiously since the research focused on participants self-reported

GPA and their responses on measures of depression, self-regulation, and loneliness at one specific point in time. The researcher had no way of knowing if participants responded truthfully. However, the researcher presented the parameters of the research verbally and in writing to all potential participants. Those who chose to participate did voluntarily and had no reason to respond in a dishonest manner.

3: Although the psychometric properties of KADS-11 for university population have been investigated in different studies (Lowe, Lipps, Gibson, Jules, & Kutcher, 2018; Mojs et al., 2015; Mousavi et al., 2019; Shahidi et al., 2014; Shojaee et al., 2016), students' scores on this scale should not be interpreted as a complete assessment for the diagnosis of depression. To augment the diagnosis, other procedures should be used. For example, based on the DSM-5, the number of symptoms, the severity of those symptoms, and the degree of functional disability should be considered in diagnosing depression. Thus, the results of other tools, clinical interviews, functional assessment, and DSM-V criteria should be considered.

4: Although participants were given adequate time to respond, in confidence, some confounding variables such as students' tiredness may interfere in results and reduce the reliability of the research.

5: The nature of student body at Mount Saint Vincent University is approximately 75% female (Office of Institutional Analysis-MSVU, 2018). To further investigate the gender differences, future researchers are encouraged to focus on male and female students in the other universities to have a parallel number of male and female samples.

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Appendixes

Appendix 1
Cover Letter for Professors

Dear Professor,

My name is Mehrdad Shahidi, and I am currently enrolled in the Inter-University Doctoral Program in Educational Studies (PhD) at MSVU. As part of my degree requirements, I am conducting research for my PhD thesis on the relational paths amongst depression, loneliness, self-regulation, and academic achievement. To conduct this research, I am seeking your support in recruiting undergraduate and graduate participants nineteen years old and older. The goal of this research is to expand our current knowledge regarding the mediating roles of the above noted predictors of students' academic achievement.

I am seeking permission to collect data in your classes. If possible, I would like to collect data during a class session. The process should take approximately 20 to 30 minutes for me to speak to students and for them to complete the scales and questionnaires in their coded research package. If this is not possible, I am seeking permission to distribute research packages to students in your classes to be picked-up by me prior to the start of the next class. Each research package contains a letter outlining the purpose of the study, an overview of the student's rights, and an invitation to participate, as well as select scales and questionnaires. In addition, a postcard-like consent form is included for students to sign and give their university identification number. This postcard will be placed in a provided envelope, sealed by the student, and passed on to the staff person at the Registrar's Office who will be accessing participants' grade point averages.

Participation in this research is completely voluntary. Your students do not have to answer any questions on the surveys that causes them discomfort. All information will be confidential. While students will be asked to provide their university identification number the researcher will have no access to any identifying information. The students' university identification number will be only used by a staff person in the Registrar's Office to access students' Grade Point Average (GPA) as a measure of their current academic achievement. Quotes from individual surveys may be cited in the thesis and future publications to illustrate a point, however, there is no way to identify the source of the quote. The focus is on group results. Data from the surveys will be coded and stored on a secure, password-protected computer. Hard copies of the surveys will be shredded once the data has been entered. To allow time for dissemination of the information through conference presentations and published articles, electronic data files will be kept for five years following the thesis defense and then deleted from the computer.

Should you have any questions regarding this study, please contact me, Mehrdad Shahidi at mehrdad.shahidi@msvu.ca or my thesis supervisor, Dr. Frederick French at frederick.french@msvu.ca. If you have any questions regarding how this study is being conducted, you may contact the University Research Ethics Board (UREB) c/o MSVU Research Office at (902) 457-6350 or via e-mail at research@msvu.ca.

Thank you for considering whether to grant permission to carry out my research project in your classes or to distribute the research packages for later pick-up. It is my hope that this research will result in a greater understanding of the mental health issues facing university students so that appropriate intervention programs can be developed.

Sincerely,

Mehrdad Shahidi, PhD Candidate, MSVU;

Appendix 2
Cover Letter for Students – In-Class Completion

Dear Student, **Code # _____**

My name is Mehrdad Shahidi, and I am currently enrolled in the Inter-University Doctoral Program in Educational Studies (PhD) at MSVU. As part of my degree requirements, I am conducting research for my PhD thesis on the relational paths amongst depression, loneliness, self-regulation, and academic achievement. The goal of this research is to expand our current knowledge regarding the mediating roles of the above noted predictors in students' academic achievement.

To conduct this research, I am seeking undergraduate and graduate participants **nineteen years old and older**. Participation in this research is completely voluntary. You do not have to answer any questions on any measures that causes you discomfort. All information will be confidential. Participants will each be given a research packages with its own numerical code. Each package contains 1) a covering letter explaining the purpose of the research and participant's rights, and 2) short measures of the variables noted above. and 3) a consent card with an envelope. If you are willing to participate, you will be asked to sign the consent card and to provide your university identification number. The consent card with your signature and identification number will be placed in an envelope by you and sealed. The sealed envelopes will be opened by a staff member in the Registrar's Office who will look up your current Grade Point Average (GPA). This staff member will send the researcher a document listing the code numbers for all participants and their associated GPAs. At no point will the researcher have access to your name or student identification number.

Quotes from individual surveys may be cited in the thesis and future publications to illustrate a point, however, there is no way to identify the source of the quote. The focus is on group results. Data from the surveys will be coded and stored on a secure, password-protected computer at MSVU. Hard copies of the surveys will be shredded once the data has been entered. To allow time for dissemination of the information through conference presentations and published articles, electronic data files will be kept for five years following the thesis defense and then deleted from the computer.

You can choose to participate or not. If you choose to participate, you can withdraw at any time while completing the measures should you change your mind and all materials you have completed until that point will be shredded. If you choose to withdraw at a later date, you can contact the researcher and provide him with the code number on this letter and all your data can be removed from the computer and hard copies shredded if they are still available. If you do not have a copy of this letter, you can contact the Registrar's Office and ask them to send your code number to the researcher so that all your data can be removed from the computer and measures shredded.

If you choose to participate in this research, please complete all the measures. Should you need any clarification regarding any of the questions please ask me, I will remain in the room until everyone is finished. You can then place the completed measures back in the research package large envelope and pass them into me. Sealed consent cards should be placed in the large envelope marked 'Registrar's Office" at the front of the room.

The process should take approximately 20 to 30 minutes depending on how many sections are applicable to you. If you find completing these measures upsetting, please contact

Counselling Services at EMF 127G, 902-457-6567 or email at counselling@msvu.ca. **Please keep this letter so that you have my contact information, your code number, and contact numbers should completing these measures upset you.**

If you like a summary of the research findings, you can contact me at the below email address and a copy will be provided.

If you have any further questions regarding this study, please contact me, Mehrdad Shahidi at mehrdad.shahidi@msvu.ca or my thesis supervisor, Dr. Frederick French, frederick.french@msvu/ca. If you have any questions regarding how this study is being conducted, you may contact the University Research Ethics Board (UREB) c/o MSVU Research Office at (902) 457-6350 or via e-mail at research@msvu.ca.

Thank you for considering participating in my research project. It is my hope that this research will result in a greater understanding of the mental health issues facing university students so that appropriate intervention programs can be developed.

Sincerely,
Mehrdad Shahidi, PhD Candidate, MSVU
Dr. Fred French. Supervisor, Faculty of Education, MSVU

Appendix 3
Research Questionnaire

Please answer as many of the questions. You do not have to answer any question that causes you discomfort.

1) Age: ☐ 19 – 23 ☐ 24-30 ☐ 31-36 ☐ > 36

2) Gender: ☐ Female ☐ Male ☐ Prefer not to say
Prefer to Self-describe as _____

3) Are you: ☐ Single ☐ Married ☐ Divorced ☐ Separated ☐ Common Law ☐ Other

4) Are you a: ☐ Canadian student (Home Province _____)

☐ International student (Home Country _____)

☐ Landed immigrant student ☐ Other: specify: _____

5) In which year of study are you? ☐ 1st year ☐ 2nd year ☐ 3rd year ☐ 4th year

6) When did you start your study at this MSVU? Year: _____

7) What degree program are you enrolled in? _____

8) My current GPA is----------
If you do not remember your GPA, please select one of the following options that best represents your current GPA:

☐ **3.7 – 4.3 (A range)** ☐ **2.7 – 3.3 (B range)** ☐ **1.7 – 2.3 (C range)** ☐ **1.0 -1.3 (D range)**

☐ **< 1.0**

9) Are you primary living with: ☐ family members ☐ parent(s) ☐ sibling(s) ☐ relative(s) ☐ non-family member(s) ☐ on your own ☐ in student residence ☐ other please specify _____

10) How many siblings do you have? None ☐ 1 ☐ 2 ☐ 3 ☐ >3 ☐

11) Has language had an impact on your experience at MSVU? ☐ yes ☐ no

12) Please place an (X) in the box that indicates the degree to which you feel each of the following have influenced your academic achievement.

	Not at all Important	Slightly Important	Neutral	Moderately Important	Very Important
Parents					
Friends of the same nationality					
Friends of different nationalities					
Your own efforts					
Professors					

13) On a scale of 1 to 5, with 1 being "not involved at all" to 5 being "very involved", please circle the number that best indicates your level of involvement with the following university and/or community activities:

Activity	Level of Involvement				
Sports	1	2	3	4	5
Fitness activities	1	2	3	4	5
Student societies at MSVU	1	2	3	4	5
Student council	1	2	3	4	5
Social events on campus	1	2	3	4	5
Social events off campus	1	2	3	4	5
Artistic/creative activities	1	2	3	4	5
International activities	1	2	3	4	5
Recreational activities off campus	1	2	3	4	5
Other (specify)	1	2	3	4	5

Comments:

_____

_____

_____

14) Please indicate your level of connectedness to the following on a scale of 1 to 5 with 1 representing "limited connection"; 2 – "some connection; 3 – "average connection"; 4 – "good connection" and 5 – "excellent connection"

Individuals/Institution	Level of Connectedness				
Parents	1	2	3	4	5
Siblings	1	2	3	4	5
Extended family members	1	2	3	4	5

Friends of the same nationality	1	2	3	4	5
Friends of different nationalities	1	2	3	4	5
Fellow students of the same nationality	1	2	3	4	5
Fellow students of different nationalities	1	2	3	4	5
University as a whole	1	2	3	4	5
Program in which you are enrolled	1	2	3	4	5
Faculty in your department	1	2	3	4	5
Faculty in other departments	1	2	3	4	5
Community	1	2	3	4	5

Comments:

_____

_____

_____

Appendix 4
Kutcher Adolescent Depression Scale (11-Item)

Over the last week, how have you been "on average" or "usually" regarding the following items? Please put (×) in the box you think it matches your feeling:

	Items	Hardly ever	Much of the time	Most of the time	All of the time
1	Low mood, sadness, feeling blah or down, depressed, just can't be bothered.				
2	Irritable, losing your temper easily, feeling pissed off, loosing it.				
3	Sleep difficulties-different from your usual (over the years before you got sick): trouble falling asleep, lying awake in bed.				
4	Feeling decreased interest in: hanging out with friends; being with your best friend; being with your boyfriend/girlfriend; going out of the house; doing school work or work; doing hobbies or sports or recreation.				
5	Feelings of worthlessness, hopelessness, letting people down, not being a good person.				
6	Feeling tired, feeling fatigued, low in energy, hard to get motivated, have to push to get things done, want to rest or lie down a lot.				
7	Trouble concentrating, can't keep your mind on schoolwork or work, daydreaming when you should be working, hard to focus when reading, getting "bored" with work or school.				
8	Feeling that life is not very much fun, not feeling good when usually (before getting sick) would feel good, not getting as much pleasure from fun things as usual (before getting sick).				
9	Feeling worried, nervous, panicky, tense, keyed up, anxious.				
10	Physical feelings of worry like: headaches, butterflies, nausea, tingling, restlessness, diarrhea, shakes or tremors.				
11	Thoughts, plans or actions about suicide or self-harm.				

Appendix 5
R-UCLA Loneliness Scale

	R-UCLA Loneliness Scale **Instruction: Please indicate how often you feel the way described in each of the following statements. Please put X in the box you think it matches your feeling**				
	Statements	**Never**	**Rarely**	**Sometimes**	**Most of the time**
1	I feel in tune with the people around me.				
2	I lack companionship				
3	There is no one I can turn to.				
4	I do not feel alone.				
5	I feel part of a group of friends.				
6	I have a lot in common with the people around me.				
7	I am no longer close to anyone.				
8	My interests and ideas are not shared by those around me				
9	I am an outgoing person				
10	There are people I feel close to.				
11	I feel left out.				
12	My social relationships are superficial.				
13	No one really knows me well				
14	I feel isolated from others				
15	I can find companionship when I want it.				
16	There are people who really understand me.				
17	I am unhappy being so withdrawn				
18	People are around me but not with me				
19	There are people I can talk to.				
20	There are people I can turn to.				

Appendix 6
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Cognitive Emotion Regulation Questionnaire – Short Form

Everyone gets confronted with negative or unpleasant events now and then and everyone responds to them in his or her own way. For the following questions, you are asked to indicate what you generally think, when you experience negative or unpleasant events.

Items	(Almost) never	Sometimes	Regularly	Often	(Almost) Always
1. I think that I have to accept that this has happened	1	2	3	4	5
2. I often think about how I feel about what I have experienced	1	2	3	4	5
3. I think I can learn something from the situation	1	2	3	4	5
4. I feel that I am the one who is responsible for what has happened	1	2	3	4	5
5. I think that I have to accept the situation	1	2	3	4	5
6. I am preoccupied with what I think and feel about what I have experienced	1	2	3	4	5
7. I think of pleasant things that have nothing to do with it	1	2	3	4	5
8. I think that I can become a stronger person as a result of what has happened	1	2	3	4	5
9. I keep thinking about how terrible it is what I have experienced	1	2	3	4	5
10. I feel that others are responsible for what has happened	1	2	3	4	5
11. I think of something nice instead of what has happened	1	2	3	4	5
12. I think about how to change the situation	1	2	3	4	5
13. I think that it hasn't been too bad compared to other things	1	2	3	4	5
14. I think that basically the cause must lie within myself	1	2	3	4	5
15. I think about a plan of what I can do best	1	2	3	4	5
16. I tell myself that there are worse things in life	1	2	3	4	5
17. I continually think how horrible the situation has been	1	2	3	4	5
18. I feel that basically the cause lies with others	1	2	3	4	5

Appendix 7

Academic Self-Report Questionnaire

Each student may make his or her own evaluation of academic achievement based on her/his academic experiences at university. Please read each of the following items and evaluate the degree of your academic achievement in your program of study

	Poor	Fair	Good	Very Good	Excellent
1. I think my progress in learning goals is…	1	2	3	4	5
2. My strategies to achieve my learning goals at university are….	1	2	3	4	5
3. Compared to when I began the study, my academic achievement is….	1	2	3	4	5
4. Generally my academic achievement is……	1	2	3	4	5
5. I think of what I can do for my learning is…	1	2	3	4	5
6. My motivation to achieve higher level of learning is…	1	2	3	4	5
7. Usually, the evaluation of my assignments is…..	1	2	3	4	5
8. I feel my achievement in doing assignments is ….	1	2	3	4	5
9. Compared to others, my scores are….	1	2	3	4	5
10. Compared to the beginning of study my improvement in assignment is…	1	2	3	4	5
11. According to my professors my academic performance is…..	1	2	3	4	5
12. My grade point average (GPA) is…..	1	2	3	4	5
13. I evaluate my own class work as….	1	2	3	4	5
14. Compared to other students, my academic performance is generally….	1	2	3	4	5
15. I evaluate my effort in learning is….	1	2	3	4	5
16. I think my skills in learning are…	1	2	3	4	5

Appendix 9
Model Fit Criteria in Path Analysis

Measure	Name	Description	Cut-off for good fit	References
X^2	Model Chi-Square	Assess overall fit and the discrepancy between the sample and fitted covariance matrices. Sensitive to sample size. H0: The model fits perfectly.	*p* value > .05	(Arbuckle, 2013; Awang, 2015; Hooper, Coughlan, & Mullen, 2008; Klem, 2000; Newsom, 2018)
(A)GFI	(Adjusted) Goodness of Fit	GFI is the proportion of variance accounted for by the estimated population covariance. Analogous to R^2. AGFI favors parsimony.	GFI ≥ .95 AGFI ≥ .90	
(N)NFI TLI	(Non) Normed-Fit Index Tucker Lewis index	An NFI of .95, indicates the model of interest improves the fit by 95% relative to the null model. NNFI is preferable for smaller samples. Sometimes the NNFI is called the Tucker Lewis index (TLI)	NFI ≥ .95 NNFI ≥ .95	
CFI	Comparative Fit Index	A revised form of NFI. Not very sensitive to sample size. Compares the fit of a target model to the fit of an independent, or null, model.	CFI ≥ .90	
RMSEA	Root Mean Square Error of Approximation	A parsimony-adjusted index. Values closer to 0 represent a good fit.	RMSEA < .08	
(S)RMR	(Standardized) Root Mean Square Residual	The square-root of the difference between the residuals of the sample covariance matrix and the hypothesized model. If items vary in range (i.e. some items are 1-5, others 1-7) then RMR is hard to interpret, better to use SRMR.	SRMR < .08	
AVE (CFA only)	Average Value Explained	The average of the R^2s for items within a factor	AVE > .5	

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