Self-Regulated Learning, Stress Mindset, and Mental Health in Post-Secondary Learners

by

Alyssa Husband
B.Ed., University of Victoria, 2021

A Thesis Submitted in Partial Fulfillment of the

Requirements for the Degree of

MASTER OF ARTS

in the Department of Educational Psychology and Leadership Studies

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University of Victoria

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We acknowledge and respect the Lək^{w}əŋən (Songhees and Esquimalt) Peoples on whose territory the university stands, and the Lək^{w}əŋən and W̱SÁNEĆ Peoples whose historical relationships with the land continue to this day.

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Abstract

While mental health in young adult populations has received significant attention in current research, the prevalence of mental health problems among post-secondary students necessitates investigation from an educational perspective. Self-regulated learning (SRL) and stress mindset have each been linked to mental health outcomes, such as psychological well-being, but few studies have investigated their relative contributions to students' mental health outcomes. This study aims to fill that gap by examining the contributions of SRL practices and stress mindset on psychological well-being among 141 undergraduate students enrolled in a learning-to-learn course at a western Canadian university. Specifically, it seeks to answer (1) to what extent engaging in SRL practices, including motivation appraisal, metacognitive control, and academic social engagement, predict students' psychological well-being and (2) whether stress mindset contributes to psychological well-being beyond the effects of SRL practices. Regression analysis revealed that academic social engagement, a key SRL practice, significantly predicted mental health outcomes. Moreover, stress mindset demonstrated an additional predictive effect on mental health, independent of SRL practices. These findings highlight the importance of addressing both SRL strategies and stress mindset to offer comprehensive mental health support for students. Implications for practice include the need for educational institutions to foster SRL and cultivate a positive stress mindset, enhancing academic performance and psychological well-being.

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Acknowledgements

If there is one thing I have learnt from this process and my academic/professional pursuits it is that nothing is done well without community. Actually, nothing is done *at all* without community.

And so, to the first in my community, Mariel Miller: I am forever grateful for your guidance. You fostered my passion for student well-being while helping me navigate the complexities of research and never wavered in my backing my pursuits. "Thank you" does not seem like a strong enough word to express my gratitude and appreciation. To Allyson Hadwin: I have been so lucky to learn from you. Your dedication to student success is palpable, and your excellence drives others to be excellent too. I was lucky to follow in the path of EPLS PhD candidate and now graduate Meg Kapil, who was exceedingly generous sharing her work pre-publication. To my educational psychology friends: You made the ups and downs of graduate school not just bearable, but fun. Thank you for the perpetual optimism, frank honesty, and for reminding me that you too were confused during stats class.

I cannot imagine a world in which I would have accomplished this feat without the encouragement and support of my family and dear friends. Even when they had no idea what I was doing, they cheered me on every step of the way. To my Mom and Dad especially, thank you.

It is difficult to summarize my admiration and gratitude for the remarkable students and young people I have had the pleasure of working with throughout my academic, personal, or professional life. I am inspired by your determination, resilience and advocacy for yourselves and your peers. Working alongside you has always been a privilege.

Dedication

To my grandfathers: Kim Husband, who's actions always spoke louder than words and showed me that learning is a lifelong pursuit, and Allan Whitehouse, whose visits would not be complete without checking-in on my "reading, writing, and arithmetic." I wish I could show both of you this.

Introduction

Post-secondary learners experience significant stress due to the pressure to succeed and the increasing responsibilities inherent to the rigorous academic environments of post-secondary institutions. This transitional period is particularly high-risk for the emergence of mental health issues, especially for first-year students encountering novel challenges. The World Health Organization (WHO, 2022) defines mental health as "a state of mental well-being that enables people to cope with the stressors of life, realize their abilities, learn well and work well, and contribute to their community." However, many post-secondary students struggle to maintain aspects of their mental health. This includes psychological well-being, or individuals' perceptions of their overall functioning and life satisfaction, or eudaimonia (Keyes, 2013), as they face multiple stressors, such as academic challenges, financial concerns, and adjusting to life away from home, that lead to a heightened risk of mental health disorders (Kessler et al., 2017).

The COVID-19 pandemic further exacerbated these challenges, adding unprecedented layers of stress and uncertainty to the lives of students. Research by Wang et al. (2020) and Zimmermann et al. (2020) confirms that undergraduate students have exhibited increased levels of distress and worsened academic outcomes because of the pandemic. Beyond the primary pandemic year of 2020, three-quarters of Canadian post-secondary students still reported adverse mental health impacts during the 2021-2022 academic year (CASA, 2022). Furthermore, the research indicates the pandemic has led to long-term mental health consequences, particularly in young people (Graupensperger et al., 2022; Larsen et al., 2023; Wiedemann et al., 2024). Larsen et al. (2023) found an increase in reported levels of anxiety and depression symptoms in children and adolescents during subsequent society lockdowns, and most notably during society

‘reopening’, underscoring the significant but delayed impact on mental health. Through semi-structured interviews Wiedemann et al. (2024) found substantial disruptions to the personal lives of young adults during the pandemic in 2020 were still yielding negative impacts during follow-up interviews in 2022. It would be an oversight to ignore the influence of the pandemic on university students’ well-being, as the adolescents who navigated their high school education during COVID-19 are now entering university, with the psychological impacts of that period still shaping their experiences. The disruptions to their formative years have significant long-term implications for their mental health, emphasizing the need for continued support and understanding of this generation’s unique challenges.

Addressing the mental health crisis facing university students is vital to support their success and well-being. A systemic review from Campbell et al. (2022) found that poor mental health adversely impacts students’ academic performance and overall success and increases the risk of students dropping out of university. The mental health crisis of post-secondary students necessitates investigation from an educational lens because of the role the academic environment, and more broadly the university environment, plays in shaping students’ well-being The post-secondary experience is associated with unique stressors (Kessler et al., 2017) that can exacerbate existing mental health issues or contribute to new ones Moghimi et al. (2023) found that post-secondary students felt that their peers had poor mental health, and that their institutions needed to do more to increase awareness and resources related to mental health on their campus. Adopting an educational perspective for investigative purposes promotes a holistic approach to student development that values student well-being alongside their academic performance and seeks to integrate supporting academic achievement with mental health support.

Emerging research in this area, such as that of Kapil (2024), suggests self-regulated learning (SRL) offers the potential to support both mental health and academic performance. Specifically, Kapil et al. (2024) examined how SRL practices and stress mindset influence mental health and academic outcomes in university students, and results demonstrated the vital role of SRL practices in supporting both mental health and academic performance. When learners engage in self-regulated learning, they take control of their own cognition, behaviour, motivation, and emotion in educational contexts (Zimmerman, 1989). From this perspective, self-regulated learning may support psychological well-being by enabling learners to proactively recognize and adapt to stressors and challenges they encounter in their studies. While SRL has been studied extensively in relation to academic outcomes, its role in mental health and psychological well-being remains underexplored.

An additional contributor to post-secondary students' psychological well-being is stress mindset, defined by Crum et al. (2013) as the belief that stress can either enhance or debilitate one's outcomes. As stress is a significant aspect of post-secondary studies, emergent research suggests a stress-is-enhancing mindset may help students cope more effectively with academic and personal stressors, while a stress-is-debilitating mindset could worsen mental health outcomes (Jenkins et al., 2021). Furthermore, while stress can interfere with critical underlying SRL processes related to cognition and motivation (e.g., memory, attention, and intraformational recall) (Keech et al., 2018), few studies have examined the relative contributions of SRL and stress mindset to the psychological well-being of post-secondary students. Given the rising prevalence of mental health issues among students and the profound influence mental health has on both academic success and life outcomes, it is critical to explore new ways to support students' wellbeing if we are to understand how post-secondary students can be best supported

during this critical transition. The present study aims to address this gap by examining the extent to which self-regulatory practices and stress mindset contribute to mental health outcomes among post-secondary students. By examining the relative contributions of these factors, this study contributes to the emerging research in this critical area and provides invaluable insight informing the development of academic programs and support for post-secondary students.

Theoretical Framework

This study is primarily grounded in two theoretical frameworks: Keyes model of mental health (2002) and self-regulated learning (SRL). The following section introduces each theoretical framework and discusses their relevance to the current research.

Model of Mental Health

The historical foundation of mental health research is challenging to synthesize due to the wide range of terminology used over time, including mental illness, mental disorder, mental health, mental well-being, and various other combinations (Davis, 2020). However, a widely accepted definition from the World Health Organization defines mental health as “a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community” (2022). Mental health research has been significantly influenced by the lens it is researched from, and various themes and models have emerged over the last 20-30 years. One of the most widely recognized frameworks in mental health research is Keyes's “Two Continua Model” (2002).

In this model, Keyes (2002) operationalizes mental health as the culmination of positive emotions and functioning in life. Mental health is described as “flourishing,” while the absence of mental health is described as “languishing” (Keyes, 2002, p. 208). A crucial implication of the model (Keyes, 2002) is the careful distinction of mental health and mental disorders as two

related concepts but at different ends of a continuum. The nuanced relationship between the two and other external variables can be evaluated with these constructs separated into two unique categories. Further, Keyes (2002) elaborated on mental health as individuals' well-being, including how they perceive their affective, psychological, and social states. Keyes's (2002) definition of mental health led to three conceptual components: psychological well-being, emotional well-being, and social well-being. The current study focuses on psychological well-being, which refers to how "individuals perceive the quality of their functioning in life" (Keyes, 2013). As a unique construct, psychological well-being (PWB) was operationalized by Ryff (1989) to demonstrate complete functioning and optimal living in six psychological dimensions: (a) purpose in life, which highlights the belief that life has meaning and purpose (Ryff & Keyes, 1995); (b) autonomy, which refers to independence and self-determination (Ryff & Keyes, 1995); (c) personal growth indicating openness to new experiences and self-improvement (Ryff & Keyes, 1995); (d) environmental mastery, which refers to creating ideal contexts to maximize opportunities (Ryff & Keyes, 1995), (e) positive relationships, which highlights developing trusting relationships with others, while self-acceptance prompts inward reflection (Ryff & Keyes, 1995), and (f) self-acceptance, which refers to the self-assessment individuals complete when reflecting on their good and bad qualities (Ryff & Keyes, 1995).

The Keyes model of mental health (2002), particularly its psychological well-being component, is well-suited for studying post-secondary students' development because the multidimensional orientation of PWB collectively addresses various aspects of psychological functioning essential to young adults' growth and development. PWB dimensions prompt individuals to reflect inwards and takes into consideration the cognitive and motivational aspects of their life. Many aspects of PWB overlap with positive learning experiences (Davis, 2020), and

the focus of PWB on positive functioning aligns well with the internal, cognitive, and motivational considerations of post-secondary students.

Self-Regulated Learning

Self-regulated learning is a proactive and intentional process in which learners metacognitively, motivationally, and behaviourally engage in their own learning (Pintrich, 2000; Zimmerman, 1989). Self-regulated learning is an essential competency for post-secondary contexts as it involves managing cognition, behaviour, motivation, and emotions by selecting, deploying, and adjusting strategies in response to new academic situations (Winne, 2018).

Over the past 25 years, several SRL models have emerged in the literature (Panadero, 2017). For example, Zimmerman's (2000) model explains the interrelation of metacognitive and motivational processes at the individual level, as learners move through three phases from forethought (task analysis and self-motivation beliefs) to performance (self-control and self-observation) to self-reflection (self-judgment and self-reaction). With the growing focus on metacognition, Pintrich's SRL model (2000) emphasizes the theoretical relationship between self-regulation and metacognition. Furthermore, Boekaerts' (2006) model contains two processing modes: mastery or learning mode and coping or well-being mode and was the first SRL model to incorporate well-being expressly.

While these SRL models emphasize distinct aspects, they share several fundamental features. Each model recognizes that learners are agentic and metacognitive, actively engaged in pursuing self-set goals. They involve complex interactions among cognition, motivation, behaviour, and emotion, highlighting the importance of meta-motivation and the cyclical nature of self-regulated learning. SRL is depicted as occurring through recursive cycles of forethought and planning, strategic engagement, and reflection and adaptation (Zimmerman & Schunk, 2011;

Schunk & Greene, 2018). These shared characteristics underscore the comprehensive and dynamic processes that enable learners to navigate their academic experiences effectively.

Winne and Hadwin's (1998) four-phase model is well-suited to the present study because it views SRL as four loosely sequenced recursive phases: In phase 1, task perception is the focus. In this phase, students establish their understanding of the task, including implicit and explicit information (Hadwin & Winne, 2012). Phase 2 refers to goal setting and is most successful when students have a clear understanding of the task. Phase 3 is strategic enactment when learners actively engage in what most describe as studying (Hadwin & Winne, 2012). Again, strategic enactment is most effective when students have both a clear understanding of the task and specific goals. Finally, phase 4 is large-scale adaptation. In Winne and Hadwin's (1998) model, large-scale adaptation is the reflection component of SRL in which students reflect on the successes and challenges they experienced in previous phases.

All four phases are grounded in the same underlying cognitive architecture, known as COPES (conditions, operations, products, evaluations, and standards) (Winne, 1997). Like the four SRL phases, COPES (Winne, 1997) also follow a loosely cyclic structure like the four SRL phases. First, conditions are composed of environmental factors and cognitive information. Conditions can relate to the characteristics of the task itself or the learner. Conditions then influence the operations, described as the cognitive processes and strategies learners use to complete tasks, including searching, monitoring, assembling, rehearsing, and translating (Davis, 2021). Next, the operations selected by the learner then shape the products, leading to knowledge gained by the student. Finally, products generate feedback for the student about their learning process, also known as evaluations, assisting the student in comparing their result to standing criteria.

Consequently, Winne and Hadwin's model of SRL (1998) is most appropriate for this study for two primary reasons. First, according to COPES (conditions, operations, products, evaluations, standards), SRL's highly situated and contextual nature allows for conditions, such as beliefs and learner experiences, including stress mindset and psychological well-being to be considered as foundational to engagement in SRL processes and products. A positive stress mindset and robust psychological well-being serve as internal conditions that influence how learners perceive and approach academic challenges, affecting their readiness to engage in SRL practices. These conditions shape the operations, or the cognitive and metacognitive strategies learners employ, and how effectively learners plan, monitor and adapt their learning strategies.

Second, when learners engage in SRL operations, such as using specific SRL practices, the products of each phase can include changes in leaner beliefs and experiences, including, stress mindset and psychological well-being. These outcomes then become conditions for future phases of learning, creating a continuous feedback loop within the COPES model. This feedback loop, spanning from strategic engagement to evaluation and adjustment, demonstrates how SRL practices not only support academic outcomes but also foster multiple dimensions of psychological well-being. Through goal setting and motivation, SRL practices contribute to a sense of purpose in life, a component of PWB (Ryff & Keyes, 1995), by helping students align their academic efforts with a broader sense of meaning. Engaging in SRL practices also supports self-determination and reinforces the autonomy component of PWB (Ryff & Keyes, 1995). Reflective and adaptive processes in SRL practices can encourage personal growth as students strive towards self-improvement (Ryff & Keyes, 1995) and become open to new challenges, and aid in fostering self-acceptance (Ryff & Keyes, 1995) as students integrate self-assessments into their development. Additionally, the focus of SRL practices on planning and environmental

management supports environmental mastery (Ryff & Keyes, 1995), enabling students to optimize their academic and personal environments. Social engagement within SRL practices promotes positive relationships (Ryff & Keyes, 1995) by fostering supportive connections with peers. Together, these dimensions illustrate how SRL practices holistically support psychological resilience and personal development, making SRL practices a critical tool for fostering well-being beyond academic success.

Psychological Well-Being, SRL Practices and Stress Mindset in Post-Secondary Students

Mental Health and Psychological Well-Being

Mental health is fundamental to the well-being and academic success of post-secondary students. This demographic faces significant mental health challenges, as approximately three-quarters of mental health disorders are diagnosed before the age of 25 (Kessler et al., 2005). University life often presents a pivotal period for developing autonomy, purpose, and self-acceptance - key components of psychological well-being (PWB) (Arnett, 2000; Stallman, 2010).

Psychological well-being, as conceptualized by Keyes' (2002) model, is particularly salient in academic settings. PWB refers to individuals' perceptions of their overall functioning and life satisfaction, emphasizing not just the absence of illness but the presence of positive functioning (Keyes, 2013; Ryan et al., 2008). This comprehensive approach to mental health encompasses both living well and functioning well, making it a valuable indicator of students' overall well-being and success (Ryan et al., 2008). Research demonstrates that PWB correlates with academic achievement and personal growth, highlighting its relevance to student success (Knoesen & Naude, 2018). Further, Knoesen and Naude (2018) found that first-year university students who reported experiences in the six dimensions of PWB developed self-acceptance and

experienced personal growth throughout the academic year. The students evaluated by Knoesen and Naude (2018) who began to experience academic mastery, personal growth, and independence, components of PWB, learned to flourish at university. The findings of Knoesen and Naude (2018) suggest that recent events influence PWB and acts as a dynamic state influenced by context and experiences.

Understanding the factors that compose PWB, such as social relationships, autonomy, and environmental mastery (Ryff & Keyes, 1995), is crucial for effectively supporting students. Academics may be the primary focus of post-secondary education, but learning engagement through self-regulated learning (SRL) practices is also likely to bear weight on students' mental health (Howell, 2009). SRL is a proactive and intentional process where learners metacognitively, motivationally, and behaviourally manage their own learning (Winne & Hadwin, 1998; Zimmerman, 1989) and is linked to academic success (Adams & Blair, 2019; Jansen et al., 2019). Evidence from Adams and Blair (2019) and Jansen et al. (2019) showed that time management, a key component of SRL, positively affects students' GPA (Adams & Blair, 2019). However, research in this area remains limited, necessitating further exploration to clarify the specific contributions of SRL and other factors.

Howell (2009) found that students with flourishing mental health exhibited higher levels of adaptive academic functioning and engaged more effectively in SRL practices compared to those with languishing mental health. This indicates an overlap between PWB and SRL, suggesting that SRL practices may predict aspects of PWB. Davis (2020) built upon these findings by showing that students' mental health fluctuated over a term and that changes in academic engagement aligned with changes in mental health. This highlights the reciprocal relationship between regulatory academic behaviours and PWB, suggesting that engagement in

SRL practices supports students' well-being. Findings from Davis (2020) also suggest that SRL positively predicts mental health, as Davis (2020) found that when students engage in SRL, they actively manage their learning and engage in beneficial strategies. Building on this foundation, emergent research has further clarified the connection between SRL and psychological well-being, demonstrating how specific SRL practices contribute to different aspects of well-being.

Emergent research has established a positive relationship between PWB, a facet of Keyes's (2002) model of mental health, and aspects of SRL, including academic engagement and goal attainment. For example, Davis and Hadwin (2019) highlighted that students who demonstrated proactive SRL strategies reported higher well-being levels than their peers who struggled with self-regulated learning. Building on these findings, Davis (2020) compared students with high and low PWB and found that those with high PWB exhibited greater academic engagement and were more successful in achieving their academic goals. This suggests that SRL practices, such as goal setting, monitoring, and strategic adaption, may be essential for fostering PWB in post-secondary students.

While these findings do not establish a causal relationship between SRL and PWB, they do indicate that the psychological well-being dimension of mental health may be more closely related to SRL processes than other aspects of Keyes's (2002) model. Davis (2020) further observed that students with low mental health reported difficulties in maintaining consistent learning engagement, implying that mental health is, at least in part, a product of learning behaviours. This supports the idea that engaging in SRL practices can contribute positively to mental health, as these practices involve active management of learning and engagement in beneficial strategies.

Theoretically, SRL should bolster positive mental health – particularly PWB – because it encompasses cognitive and motivational processes that contribute to academic outcomes such as goal attainment, sustained engagement, and the development of adaptive beliefs (Winne & Hadwin, 1998; Zimmerman, 2008). SRL practices can be defined as "the cognitive, motivational, behaviour and metacognitive actions" that learners use to manage their study episodes (Hadwin et al., 2021). These practices are complex and multifaceted, influencing student success and mental health outcomes (Hadwin et al., 2021). Notably, three SRL practices are of particular interest for understanding their contribution to PWB: motivation appraisal, metacognitive control and adaptation, and academic social engagement.

SRL and SRL Practices

Motivation appraisal involves assessing beliefs about one's ability to succeed and emotional responses to tasks, supporting autonomy and self-efficacy (Hadwin & Winne, 2012). This practice is essential to SRL as it shapes students' belief in their ability to achieve their goals and sustain motivation (Hadwin & Winne, 2012). Motivation appraisal aligns with PWB by supporting autonomy and self-efficacy, components that are integral to positive psychological functioning (Ryan & Deci, 2000). By fostering a realistic and positive view of one's abilities, motivation appraisal can empower students to persist through academic challenges.

Metacognitive control and adaptation refers to the processes through which learners monitor their progress, evaluate the effectiveness of their strategies, and make necessary adjustments to improve learning outcomes (Winne & Hadwin, 1998). This cyclical process enables students to remain engaged and proactive in their learning. The ability to adapt strategies to overcome obstacles reflects environmental mastery – a key facet of PWB – by demonstrating students' capacity to navigate and exert control over their academic environment (Keyes 2002).

Academic social engagement promotes positive relationships by encouraging students to seek support and collaborate, reinforcing the social dimensions of well-being (Hadwin et al., 2021). The social dimension of learning, emphasized in Winne and Hadwin's (1998) SRL model, highlights the importance of collaboration and mutual assistance. This practice supports the PWB component of positive relationships, which is crucial for well-being (Keyes, 2013). Engaging in academic social networks provides both cognitive and emotional support, facilitating a sense of belonging and enhanced well-being.

Emerging research supports these connections. For example, the work of Kapil (2024) underscores the potential benefits of SRL practices in supporting student success and mitigating challenges related to motivation and social-emotional functioning. Kapil (2024) found that SRL practices, including metacognitive adaptation and academic social engagement, could positively influence markers of student success, such as reduced motivational difficulties and social-emotional resilience, beyond what was accounted for by stress appraisals alone.

Theoretically, these SRL practices could contribute to PWB through their respective alignments with autonomy, personal growth, and positive relationships – core dimensions of Keyes's (2002) model of mental health. Motivation appraisal enhances autonomy by reinforcing students' beliefs in their competence and control over learning. Metacognitive control and adaptation facilitate environmental mastery, empowering students to handle complex academic demands effectively. Academic social engagement nurtures positive relationships by encouraging supportive interactions and collaboration.

While these theoretical connections are compelling, there is a need for further empirical research to confirm whether SRL practices directly contribute to PWB and other influencing factors. Understanding these dynamics could inform the design of targeted interventions to

enhance academic performance and mental health among post-secondary students. In addition to SRL, stress mindset –the belief about whether stress is enhancing or debilitating – plays a unique role in student outcomes. Crum et al. (2013) found that individuals with a positive stress mindset were more resilient, had better psychological well-being, and performed better academically. While some suggest that SRL and stress mindset are intertwined, understanding their independent contributions is vital for designing targeted interventions.

Disentangling the effects of SRL and stress mindset can reveal whether interventions should focus on enhancing SRL practices, fostering a positive stress mindset, or both. For example, stress mindset may influence how students engage in SRL practices during challenging academic tasks, thereby impacting PWB. Davis and Hadwin (2021) highlighted that flourishing mental health involves academic engagement and adaptive responses to stress, suggesting that both SRL and stress mindset contribute to PWB.

Stress and Stress Mindset

Stress can be defined in multiple ways. The World Health Organization (2023) describes stress as a state of worry or mental tension caused by a difficult situation. This natural human response prompts us to address challenges and threats. Everyone experiences stress to some degree, but how we respond to stress significantly impacts our overall well-being. Tilbrook (2007) offers a more complex definition, describing stress as "a complex physiological state that embodies a range of integrative physiological and behavioural processes that occur when there is a real or perceived threat to homeostasis." These definitions highlight the multifaceted nature of stress and its profound implications for human functioning.

For university students, transitioning from adolescence to adulthood is a particularly stressful period (Vidal et al., 2018). This stage often coincides with the early years of post-

secondary education, when students report experiencing the highest stress levels in their academic careers (Conley et al., 2020; Pidgeon et al., 2014). The COVID-19 pandemic further exacerbated stress among young people. A systematic review by Varma et al. (2021) found that during the pandemic, young people were especially vulnerable to anxiety, stress, and poor sleep, with children and young adolescents displaying lower resilience to stress compared to adults.

Encountering stress in life is inevitable, and significant amounts of stress have negative consequences across the lifespan (Chaing et al., 2022; Romano et al., 2015). However, stressors or the experience of stress is separate from one's perception of stress, which is how an individual makes meaning of the stress they are exposed to (Cohen et al., 1983). Further, an individual's perceived stress can be assessed as the degree to which they find their lives unpredictable, uncontrollable, and overloading (Cohen et al., 1983). Just as the stress someone is exposed to may be influenced by a variety of controllable and uncontrollable factors, perceptions of stress are too affected by additional influences.

Contextual Factors Affecting Stress Perception

Various contextual factors may influence an individual's experience with stress, their perception of stress, and how they manage it. For example, psychological stress during childhood and adolescence has long-term consequences on health and academic outcomes. Chiang et al. (2022) emphasize that early-life psychosocial stress increases the risk of health problems across the life course. Early and frequent exposure to stress may raise an individual's baseline to tolerable stress levels or shape their perception that everything in life is stressful. Similarly, Romano et al. (2015) and Teicher and Samson (2013) note that individuals exposed to such stress tend to achieve less academically and are at a higher risk of developing mental health

issues, and this may yield a negative feedback loop in which those with early stress experiences have worsening mental health.

Cultural and social factors also play a critical role in shaping stress perceptions and responses. Cultural and community narratives influence mental health perceptions and reveal both barriers and supports related to cultural identity (Bilač et al., 2024). For instance, a study by Dutta et al. (2017) found that African American residents of a community in Northern Indiana often attributed stress to social structures, including employment challenges and discrimination. Their study responses highlighted how stress manifests physically in the body and emphasized the impact of cultural narratives on stress management. Similarly, post-secondary students' perception of stress may be positively influenced by the social norms they encounter in the academic environment, such as students finding solidarity and unity with peers experiencing similar struggles (Mishra, 2020).

Further, an individual's perception of stress might be influenced by their ability to integrate difficult experiences. Caregivers of children with autism spectrum disorder who were able to narrate and integrate negative stress experiences into their life stories demonstrated better overall mental health than those who were not able to integrate their negative experiences (Mason et al., 2019). Individuals who could make meaning of the stress they encountered reported better mental health, which may strengthen their ability to respond to future stressors. Social support is another critical factor. Jun et al. (2018) and Mishra (2020) found that post-secondary students who perceived high levels of social support were better equipped to manage stress. The perception, or belief, the students had about the social support available to them improved their ability to manage stressors. Stress resilience, defined as the ability to recover after significant stressors, is influenced by coping strategies, self-efficacy, and social support (Mason

et al., 2019). The perceptions or beliefs individuals hold have demonstrated influence on their ability to respond to stressors, and this leads us to mindset theory. Specifically, a small emerging body of research focused on the role of mindset in stress management, underscoring the importance of how individuals perceive and respond to stress.

Mindsets

The emerging field of stress mindset originates from Dweck's (2006) milestone work on entity and incremental beliefs. Dweck (2006; Blackwell et al., 2007) contributed significant research on entity and incremental beliefs regarding intelligence mindsets. Mindsets are a mental frame that orientates individuals toward actions (Crum et al., 2013; Dweck, 2008), and regard beliefs about the flexibility of characteristics, such as intelligence (Meyer et al., 2024). Dweck (2006) and Blackwell et al. (2007) have demonstrated that mindsets regarding whether intelligence is malleable can predict goals, beliefs about effort, and reactions to setbacks, which predict outcomes. For example, Aronson et al. (2002) and Blackwell et al. (2007) showed that students who developed a mindset that intelligence is malleable had a greater appreciation of academics, increased motivation, and increased GPAs compared to peers with an intelligence-is-fixed mindset.

Stress Mindset

Stemming from the foundational research of Dweck (2006), Crum et al. (2013) applied mindset logic to the world of stress. Discussion of stress typically conjures feelings of anxiety and overwhelm and has been associated with psychological disorders such as depression and suicidality in college students (Liu et al., 2019). Despite this, stress has also been shown to foster growth and coping in various environments, such as learning environments, by driving an individual to consider perspectives and gain an appetite for growth (Crum et al., 2013). Rather

than assessing if the stress itself is helpful or harmful, stress mindset explicitly refers to evaluating the nature of stress itself (Crum et al., 2017). Stress mindset references an individual's implicit beliefs in the specific context of their relationship to stress. The underpinning of Crum et al.'s (2013) conceptualization of stress mindset is that different stress mindsets will impact how stress is psychologically experienced and behaviourally approached. Stress mindset affects the psychological context within which coping strategies are selected by the student (Crum et al., 2017). Crum (et al., 2017) conceptualized this construct to the degree to which an individual holds the belief of a "stress-is-enhancing mindset" or "stress-is-debilitating mindset." These two contrasting mindsets indicate whether an individual believes that stress can lead to enhanced outcomes for areas such as performance, health, and learning or if stress will result in debilitating consequences in these areas (Crum et al., 2017). What sets stress mindset apart from other related psychosocial constructs is that stress mindset is a metacognitive belief about the nature of stress; it is unique and distinct from the amount of stress an individual is experiencing, how that stress is appraised, and how it is coped with (Crum et al., 2017).

However, these mindsets are not black and white. A nuanced understanding of stress and stress mindset is vital, as experiencing stress can both enhance outcomes and debilitate them, often referred to as the stress paradox (Crum et al., 2017). Crum et al. (2017) argue that an individual's mindset regarding stress influences their motivation, actions, and coping behaviours. Individuals who take a stress-is-enhancing mindset utilize motivation to accept stress and engage in action and coping behaviours that meet the needs at the foundation of the stress situation (Crum et al., 2017). In comparison, individuals who hold a stress-is-debilitating mindset have the primary goal of avoiding stress to prevent worsening outcomes.

Further, a stress-is-enhancing mindset has been related to more adaptive cortisol reactivity profiles under acute stress. Crum et al. (2013) demonstrated that for individuals with higher cortisol reactivity, a stress-is-enhancing mindset lowered the cortisol response; for those with low or hypo-cortisol arousal reactivity, the same mindset increased cortisol response, ultimately optimizing stress adaptation. However, it is important to note that early life experiences with stress can lead to chronic activation of the stress response system (Smith & Pollak, 2020), which might yield cortisol reactivity profiles that differ between individuals with stress exposure in early life and those without stress exposure. Early experiences and subsequent cortisol reactivity profiles may also create a foundation for adaptive or maladaptive stress mindsets. While a stress-is-enhancing mindset has been shown to optimize stress adaptation (Crum et al., 2013), the results may differ depending on individual developmental and contextual factors.

Emergent research suggests that stress mindset predicts mental health. Kapil et al. (2022) found that a stress mindset is directly associated with mental health, with results demonstrating stress mindset predicts an increase in hedonic well-being. Two studies support Kapil et al.'s (2022) findings, with results at both the high school (Wang et al., 2022) and post-secondary (Huebschmann & Sheets, 2020) levels demonstrating that students with a stress-is-enhancing mindset experienced less depressive and anxiety symptoms, signs of poor mental health, compared to peers with a stress-is-debilitating mindset.

When students have a mindset of stress-is-enhancing, they are more likely to utilize motivation to accept stress and engage in coping behaviours that meet the needs of the stress situation (Crum et al., 2013). In an academic setting, this can be theorized to lead to better management of learning, a common stressor for post-secondary students (Wang et al., 2020;

Zimmermann et al., 2020). While a basic understanding of the relationship between stress mindset and mental health is evident in the literature, little research exists has examined the unique contribution of stress mindset for promoting psychological well-being alongside the impact of SRL practices. This topic is essential because it is understood that stress can interfere with cognitive and motivational processes (e.g., memory, attention, and intraformational recall) during learning, critical underlying components of SRL (Keech et al., 2018). For example, Meghina et al. (2021) found that undergraduate learners who reported higher stress levels due to COVID-19 demonstrated fewer learning gains from an online course than peers who reported less distress. While stress mindset differs from actual stress levels, a substantial body of work indicates the critical impact of stress on cognitive and motivational processes during learning and calls for further investigation. Stress mindset is distinct from stress appraisal or coping strategies, focusing instead of beliefs about the inherent nature of stress (Crum et al., 2017). Students will inevitably encounter stress in post-secondary (e.g., deadlines Since stress is unavoidable, it would be beneficial for students to operate from a frame of mind in which they see stress as enhancing. Fortunately for students who do not already possess a stress-is-enhancing mindset, mindset constructs (Dweck, 2006) tell us that an individual's perception of stress is malleable and can change to yield positive outcomes (Crum et al., 2013). Further, the research demonstrates that like a growth mindset, a stress mindset can be developed through interventions (Meyer et al., 2024).

The COPES architecture in Winne and Hadwin's (1998) model of SRL provides a theoretical basis for understanding how SRL practices contribute to psychological well-being (PWB). SRL practices involve proactive engagement in monitoring and strategy adaptation, as well as engaging in social relationships, which support various dimensions of PWB, such as

autonomy, environmental mastery, personal growth, and personal relationships. These processes empower students to manage academic and personal challenges more effectively, promoting resilience and over well-being. Separately, stress mindset, the belief that stress can have either enhancing or debilitating effects, also plays a crucial role in PWB. A stress-is-enhancing mindset encourages adaptive responses to stressors, leading to improved psychological outcomes, while a stress-is-debilitating mindset may hinder well-being by fostering avoidance and maladaptive coping strategies. Together, SRL practices and stress mindset should account for more variability in PWB, as each construct addresses various aspects of student functioning. SRL practices provide the tools for self-regulation and mastery, while stress mindset shapes students' approach to stressors. Examining these factors independently and in combination offers a more comprehensive understanding of their contributions to PWB, supporting the development of targeted interventions to enhance students' well-being.

Purpose and Research Questions

The purpose of this study is to examine the contributions of SRL practices and stress mindset on psychological well-being in undergraduate students. Specifically, the research addresses the following two questions.

Research Question 1: Does engagement in SRL practices predict psychological well-being?

H_0: Engagement in SRL practices does not predict mental health.

H_1: Engagement in SRL practices positively predicts mental health.

Research Question 2: Does stress mindset contribute to psychological well-being, above and beyond the variability accounted for by SRL practices?

H_0: Stress mindset does not contribute to psychological well-being, above and beyond the variability accounted for by SRL practices.

H_1: Stress mindset will contribute to psychological well-being above and beyond the variability accounted for by SRL practices.

Research Design

This study employed a correlational research design to examine the relationships between self-regulated learning (SRL), stress mindset, and psychological well-being among undergraduate students over an academic semester. Using hierarchical regression analysis, the research examines the unique and incremental contributions of SRL practices and stress mindset on psychological well-being. Regression analysis is appropriate for the proposed study because it allows for estimating the extent to which SRL practices and stress mindset are associated with PWB, while controlling for potential overlap between the variables. This method enables the examination of whether stress mindset contributes to PWB above and beyond what is accounted for by key SRL practices, providing insights into their independent and combined impacts. Although causality cannot be inferred, regression analysis offers an in-depth understanding of how these factors interact within an educational context, aiding in the development of targeted interventions to support student mental health.

Methods

Author Positionality

Thorough reflection of identity and positionality is fundamental to disrupting privilege and bias in academia (Secules et al., 2021). Engaging in the process of writing a positionality statement encourages researchers to examine the complex social identities they hold and how these identities shape their research process. First and foremost, I respect and acknowledge the QayQayt people, whose traditional territory (New Westminster, BC) is where I was born and raised. With gratitude, I give thanks to the Lək^{w}əŋən, Songhees, Esquimalt and W̲SÁNEĆ

peoples, whose territory (Victoria and Saanich, BC) I have been a visitor on since 2015 and now call home. I am a white, cisgender 5th generation settler with English and Irish heritage on my mother's side and English and Swedish heritage on my father's. My identity carries an intersection of privilege and power as a white woman in Canada, and it would be an oversight not to acknowledge the unearned benefits my identity has provided throughout my academic, career and personal pursuits. My educational psychology research lens is molded by my identity, values, beliefs, and experiences, leading me to center post-secondary learners' experiences and mental health. I recognize the privilege of working with this population and topic and my responsibility to ensure that the research process is completed with respect and dignity for all participants. The research presented is conducted at the University of Victoria, on the traditional and unceded territory of the Lək^{w}əŋən (Songhees and Esquimalt) Peoples. Both the Lək^{w}əŋən and W̱SÁNEĆ Peoples have relationships with the land that continue to this day.

Participants

Participants were undergraduate students (*N = 141,* M age = 19.07 years, 12 students did not report their age) enrolled in a learning-to-learn course at a Western Canadian university during the fall 2023 semester. Students were 47.5% male, 36.9% female, 0.03% non-binary/gender-fluid, 12.8% did not identify gender. The purpose of this course was to develop theoretical and practical understandings of self-regulated learning by supporting learners to experiment with their learning. As part of their participation in the course, learners completed weekly instructional modules which included a range of self-assessments on self-regulated learning and regulating emotions, stress, and mental health. By enrolling in the course, learners automatically were included in the research but could withdraw their consent at any time during the course without penalty. Participation involved allowing regular coursework to be examined

for research purposes after the end of the course. Course instructors were not aware of which students were participating in the research and data were not released to the researchers until after course completion and grade submission. Prior to beginning the study, our research protocol was reviewed and approved by the university's affiliated research ethics board. Consent information and data were released to the researchers after course completion and grade submission.

Measures

SRL Practices

Motivation Appraisal. *The motivation appraisal* subscale is a unidimensional measurement from the SRL-Practices scale in the Self-Regulated Learning Profile and Self-Diagnostic Tool (SRL-PSD-2021, Hadwin et al, 2022). The motivation appraisal subscale consists of three items. The instruction for the subscale is "Please rate how true each statement is for you. Over the last two weeks, when I did academic work, I…." Items included "Assessed if I think I can do it," for example (see Table A1 in Appendix A). Participants rated each item on a 5-point Likert scale ranging from 1 *Never true* to 5 *Always true*. Higher scores indicate participants are engaging SRL practices that are expected to facilitate academic success. The motivation appraisal subscale reported a MacDonald's omega of .667, indicating insufficient internal consistency (Hadwin et al., 2021). This discrepancy is addressed in the results and discussion sections.

Metacognitive Control and Adaptation. *The metacognitive control and adaptation* subscale is a unidimensional measurement from the SRL-Practices scale in the Self-Regulated Learning Profile and Self-Diagnostic Tool (SRL-PSD-2021, Hadwin et al, 2022). The metacognitive control and adaptation subscale consists of six items. The instruction for the

subscale is “Please rate how true each statement is for you. Over the last two weeks, when I did academic work, I….” Items included “Modified my plans for the task,” for example (see Table A1 in Appendix A). Participants rated each item on a 5-point Likert scale ranging from 1 *Never true* to 5 *Always true*. Higher scores indicate participants are engaging SRL practices that are expected to facilitate academic success. The metacognitive control and adaptation subscale reported a MacDonald’s omega of .784, indicating acceptable internal consistency (Hadwin et al., 2021.

Academic Social Engagement. *The academic social engagement* subscale is a unidimensional measurement from the SRL-Practices scale in the Self-Regulated Learning Profile and Self-Diagnostic Tool (SRL-PSD-2021, Hadwin et al, 2021). The academic social engagement subscale consists of three items. The instruction for the subscale is “Please rate how true each statement is for you. Over the last two weeks, when I did academic work, I….” Items included “Got to know people in the class,” (see Table A1 in Appendix A). Participants rated each item on a 5-point Likert scale ranging from 1 *Never true* to 5 *Always true*. Higher scores indicated more proactive self-regulated learning behaviours or practices. The academic social engagement subscale reported a MacDonald’s omega of .80, indicating good internal consistency (Hadwin et al., 2021).

Psychological Well-Being

The psychological well-being subscale is a measure from the Mental Health Continuum Short Form (MHC-SF) (Keyes, 2009), a 14-item scale derived from the Mental Health Continuum Long Form. The psychological well-being subscale consists of six items. The instruction for the subscale is “e.g., “Please answer the following questions about how you have been feeling during the past month. During the past month, how often do you feel….” Items

included “That you had experiences that challenged you to grow and become a better person?” for example (See Table A2 in Appendix A). Participants rated each statement on a 5-point Likert scale ranging from 1 *Never true* to 5 *Always true*. The response options assess the frequency with which respondents experience symptoms of positive psychological well-being. All six items are summed and yield a total score ranging from 0 to 30. Higher scores indicate greater levels of psychological well-being. The MHC-SF reports excellent internal consistency (>.80; Keyes, 2005; Keyes et al., 2008). The MHC-SF was administrated during week 10 of the ED-D 101 course.

Stress Mindset

The Stress Mindset Measure (SMM) was developed by Crum et al. (2013) to assess the extent to which an individual adopts a mindset that the effects of stress are enhancing or debilitating. The eight items evaluate a participant’s general stress mindset (e.g., “The effects of stress are negative and should be avoided”), as well as signs and symptoms related to the enhancing and debilitating consequences of stress in the realms of health and vitality, learning and growth, and performance and productivity (e.g., “Experiencing stress improves health and vitality”). The instruction for the measure is “Please rate how true each statement is for you” (See Table A3 in Appendix A). Participants rated each item on a 5-point Likert scale ranging from *Never true* to 5 *Always true*.” In this study, the SMM was adapted to evaluate learners’ stress-is-enhancing and stress-is-debilitating mindsets. The stress-is-enhancing mindset was measured by reverse scoring the four negative items (indicated by an*) and then taking the mean of all eight items. Higher scores on the SMM represent the mindset that stress is enhancing, while lower scores indicate a stress-is-debilitating mindset. The SMM reports Cronbach’s alpha

of .86, indicating excellent internal consistency (Crum et al., 2013). The SMM scale was administered in week 10 of the ED-D 101 course.

Procedure

The study was conducted over a 12-week semester during which students completed self-assessment scales relevant to the instructional topic of the week. These self-assessments allowed students to reflect on their learning journey and engage with the instructional content. To explore how early-semester SRL practices influence late-semester psychological well-being (PWB), data collection was purposefully timed.

During week 2, students completed the SRL-PSD-2021 scale (Hadwin et al., 2022), which included the SRL-Practices subscale. This timing was aligned with the introductory instruction on SRL practices, setting a baseline for understanding students' self-regulatory behaviours early in the semester. The data collected at this point provided insight into students' initial SRL practices and their approach to learning at the beginning of the academic term.

In week 10, students completed Mental Health Continuum-Short Form (MHC-SF) and the Stress Mindset Measure (SMM), corresponding with instructional content focused on regulating emotions, stress, and mental health. This late-semester timing captured students' PWB and stress mindset after a significant portion of the academic term had passed, allowing for the examination of how early-semester SRL practices might predict PWB.

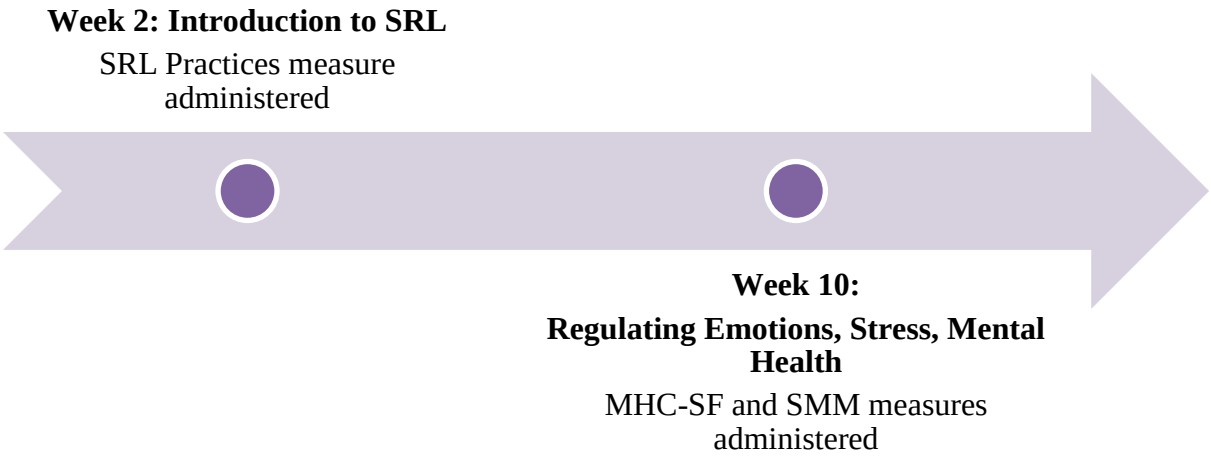
By aligning the timing of data collection with the instructional content and research questions, this study aimed to understand the potential impact of initial SRL practices on later-semester PWB and stress mindset. This approach facilitated an in-depth analysis of the relationship between early self-regulatory behavior and later psychological outcomes within an

educational context. A figure with a visual representation of this timing can be found below in Figure 1.

This practice reciprocates the research process with the learners, as students in the learning-to-learn course have immediate access to their results. Students are then supported to reflect on their results through the instruction module and integrate this feedback into the development of their SRL skills. Reciprocal research practice means that both the researcher and learners benefit from the research activity and centres the benefit to participants in the process from start to finish. Reciprocal research practice contributes to the dismantling of 'traditional' western structures of psychology research, is a demonstration of Indigenous ways of knowing and being and aligns with the notion that acquiring knowledge through student-centered learning is the ethos of higher education institutions.

Figure 1

Timing of Instructional Topics and Corresponding Measures



Analysis

To examine the contributions of self-regulated learning (SRL) and stress mindset to psychological well-being a hierarchical regression analysis was conducted using RStudio (RStudio Team, 2024). The analyses aimed to address the two research questions: (1) does engagement in SRL practices predict psychological well-being? And (2) does stress mindset contribute to psychological well-being, above and beyond the variability accounted for by SRL practices? Prior to analysis the data was screened and examined to assess the suitability for regression analysis. The data includes a continuous dependent variable and two continuous independent variables, meeting the first two assumptions required for a multiple regression (Fein, et al., 2022) There were no missing cases for the SRL variable, but 17 missing cases for the stress mindset and psychological well-being variables. Missing cases were excluded pairwise from the final analysis. The sample size (N = 141) met the recommended participant number for regression when testing individual predictors outlined by Green (1991), which suggested N > 104 + m (where m is the number of independent variables). A power analysis was also conducted in RStudio (RStudio Team, 2024) to determine the adequacy of the sample size for finding a medium effect size (R^2 = .15) with four predictor variables (motivation appraisal, metacognitive control and adaptation, academic social engagement, and stress mindset). The analysis parameters included the sample size of 141 and a significance level of .05, as recommended for studies in the psychology research (Cohen, 1992). The power was calculated to be .967 and indicated a 96.7% probability of detecting a medium effect if an effect existed.

Graphical representations were used to determine if the data met assumptions for normality, linearity, homoscedasticity, and multicollinearity as required for multiple regression. Pearson product correlations were examined between the predictor variables of SRL and stress mindset to investigate collinearity. Correlations between each SRL variable and stress mindset

(motivation appraisal r = .093, metacognitive control and adaptation r = .16, N = 141) indicated a weak positive linear relationship between the two variables, but this relationship was not statistically significant. Similarly, academic social engagement was weakly positively correlated with stress mindset (r = .15, N = 141). Tolerance values were calculated for all predictor variables, and all were found to be significantly greater than 0.10, and the regression analysis proceeded without significant concern for multicollinearity.

Normality was assessed by examining skewness and kurtosis for each variable: motivation appraisal (skewness = -.37, kurtosis = 3.30), metacognitive control and adaptation (skewness = -.59, kurtosis = 3.65), academic social engagement (skewness = -.41, kurtosis = 2.78), stress mindset (skewness = 0.08, kurtosis = 3.94), and psychological well-being (skewness = -1.0, kurtosis = 4.35). Most variables reported a negative skewness, suggesting that more respondents scored higher on these scales. Additionally, most variables reported moderately leptokurtic distributions, indicating more extreme scores than seen in a normal distribution. However, all variables were within acceptable ranges (Kline, 2011). Further, histograms for all variables (Appendix C) visually confirm that most variables tended to fall within normal distribution, with moderate variations in skewness and slight variations in kurtosis.

A residual vs. fitted plot assessed the data's linearity, and the results indicate a primarily linear relationship between the predictors and the outcome variable (Appendix D). Scatterplots of the SRL and stress mindset variables indicated linear relationships between predictors and outcome variables (Appendix E). Scatterplots of regression residuals demonstrated relative spread across the range of fitted values and suggested that the assumption of homoscedasticity was met (Appendix F). Further, the residuals were primarily found around the zero line, which did not suggest curvilinear relations amongst the variables. The scatterplots also did not indicate

any significant outliers, and subsequently, it can be suggested that the models are appropriate for the present data.

The residual vs. fitted plot for Regression Model 2 (SRL practices and stress mindset predicting psychological well-being) also demonstrated a primarily linear relationship between the predictors and the outcome variable (Appendix G). Histograms of the regression residuals for both models indicate that the residuals are approximately normally distributed, with some moderate variations (Appendix H).

Results

Descriptive Statistics

Means, standard deviations (SD), skewness, and kurtosis of all measures was generated by RStudio (RStudio Team, 2024) to examine the spread and composition of the data. Results indicated a mean score of 10.01 on motivation appraisal (SD = 2.23), 21.11 on metacognitive control and adaptation (SD = 3.85), and 10.11 on academic social engagement (SD =2.83). Mean score for stress mindset was 26.01 (SD = 3.75). Results also indicated a mean score on psychological well-being (PWB) of 22.08 (SD = 4.34). These results suggest a moderate to high level of PWB amongst the sample, but the negative skew and positive kurtosis suggest a possible subgroup within the sample with lower PWB.

Further, Cronbach's alpha was calculated to assess the internal consistency of each variable in this study. The reliability coefficients for each variable are as follows: PWB (α = 0.86), stress mindset (α = 0.72), motivation appraisal (α = 0.66), metacognitive control and adaptation (α = 0.78), and academic social engagement (α = 0.71). The values indicate acceptable to good reliability, with PWB showing strong internal consistency. The motivation appraisal subscale's alpha value was below the commonly accepted threshold of 0.70,

demonstrating further challenges with this subscale. All preliminary statistics are reported in Table 1.

Correlation Analysis

Pearson product-moment correlations were conducted in RStudio (RStudio Team, 2024) and revealed positive correlations between SRL practices, stress mindset, and psychological well-being. Specifically, there was a small positive correlation between psychological well-being and stress mindset, r (139) = 0.25, $p < 0.01$, indicating that a greater stress-is-enhancing mindset is associated with higher psychological well-being. A similar small positive correlation was found between psychological well-being and the metacognitive control and adaptation subscale, r (139) = 0.22, $p < 0.01$, suggesting that modifying beliefs and plans is also associated with strong psychological well-being. Additionally, a medium positive correlation was observed between the academic social engagement subscale and psychological well-being, r (139) = 0.39, $p < 0.01$, suggesting that building social relationships with peers in an academic setting is related to better mental health. The high intercorrelations between motivation appraisal and metacognitive control suggest that motivation appraisal does not add unique predictive value for psychological well-being beyond what is already explained by other SRL practices. This redundancy indicates that motivation appraisal might not contribute to the prediction of psychological well-being in the context of this study. Correlations among all variables are reported in Table 1.

Regression Analyses

To investigate how well SRL practices and stress mindset predict psychological well-being (PWB), a hierarchical linear regression was conducted. The assumptions of linearity,

normality of errors, and independence of errors were checked and met. Means and standard deviations were presented in Table 1.

When SRL practices were entered as a block in Model 1, they predicted PWB, F (3,137) = 9.21, p = < .001 an R^2 of .168. This indicates that SRL practices explain 16.8% of the variance in PWB. Within this step, academic social engagement emerged as a significant predictor (B = 0.55, β = 0.36 p <.001), while motivation appraisal and metacognitive control & adaptation did not reach significance.

When stress mindset was added in Model 2, it improved the model, with F (1,136) = 8.59, p < 0.001 and an R^2 of .202, demonstrating a change in R^2 of .034. The full model, including both SRL practices and stress mindset, accounted for 20.2% of the variance in PWB, indicating a moderate effect size according to Cohen's guidelines (1988).

The beta weights and significance values, presented in Table 3, indicate that stress mindset (B = 0.22, β=0.19, p <.01) makes a unique contribution to predicting PWB beyond SRL practices. Of the predictors, academic social engagement remains the strongest predictor (β = 0.34), suggesting that social engagement in academic contexts has the greatest influence on PWB.

Discussion

This study aimed to explore whether SRL practices collectively predict psychological well-being and whether stress mindset contributes additional predictive value. In sum, the findings indicate that SRL practices, particularly academic social engagement, are indeed significant predictors, with stress mindset further enhancing psychological well-being. Drawing on Winne and Hadwin's model of SRL (1998) and Hadwin et al.'s (2021) conceptualization of SRL practices, stress mindset theory, and Keyes's model of mental health (2002), the current study

utilized a hierarchical regression analysis to explore whether SRL practices and stress mindset contribute to psychological well-being among post-secondary students.

Do SRL practices predict psychological well-being?

Findings partially supported the hypothesis that self-regulated learning practices positively predict psychological well-being. Specifically, academic social engagement was a strong predictor of psychological well-being. This finding is consistent with previous research indicating a link between SRL and psychological well-being, as a specific indicator of mental health (Davis, 2020; Kapil, 2024). For example, Davis (2020), found that SRL processes were related to better psychological well-being in post-secondary learners. Further, Kapil (2024) found that SRL that academic and social engagement, are associated with mental health outcomes in post-secondary students. This suggests that the SRL practice of academic social engagement affects psychological well-being. This aligns with the cognitive architecture of Winne and Hadwin's (1998) model of SRL, in which operations (e.g. academic social engagement) influence and shape products (e.g. psychological well-being). SRL practices that relate to building positive relationships had the greatest impact on psychological well-being in this study. In other words, students who reported engaging in academic social practices like connecting with peers and enjoying their university experience also reported higher PWB. This connection may stem from alignment between the academic social engagement scale and the positive relationships component of the PWB scale, suggesting that students who form social bonds benefit in terms of psychological well-being. It is also possible that students who report the use of academic social engagement practices at the beginning of the term are promptly integrated into the academic social community, and the resulting early and sustained social ties yield better PWB at the end of the term. The closely related nature of the academic social

engagement scale and the PWB scale may point towards a relationship between these two measures and warrants further empirical investigation.

The lack of a significant predictive effect for the additional two SRL practices examined in this study, metacognitive control and adaptation and motivation appraisal, may seem surprising as it contradicts the study's hypotheses and theoretical framework. This finding could suggest that while the practices are theoretically relevant in self-regulated learning, they have a limited role in predicting mental health outcomes in this sample. An additional possible interpretation for the divergence is that academic social engagement might overshadow other SRL practices in its influence on PWB, perhaps because it directly involves building positive relationships and integrating into the academic community factors closely linked to psychological well-being.

Additionally, it may be that while metacognitive control and adaptation support certain aspects of PWB, the impact does not extend significantly beyond that of academic social engagement and stress mindset.

Further, the high intercorrelations between motivation appraisal and metacognitive control and adaptation suggests that these constructs may overlap, capturing similar aspects of SRL without uniquely contributing to PWB. The redundancy could indicate that motivation appraisal, as measured in this study, does not capture an independent or distinct effect on psychological well-being, possibly due to how students interpret and respond to motivation- and metacognitive- items on the scales.

Additionally, the lack of predictive value for motivation appraisal could be the result of measurement issues, such as the low internal consistency (Cronbach's alpha = 0.66), as seen in the data.

Table 1
Descriptive Statistics and Correlations for all Variables

Variable	M	SD	α	Min	Max	Skewness	Kurtosis	1	2	3	4
1. Psychological Well-Being (PWB)	22.08	4.34	0.86	7	30	-1.00	4.35				
2. Stress Mindset	26.01	3.75	0.72	15	37	0.08	3.94	.25			
3. SRL - Motivation Appraisal	10.01	3.75	0.66	3	15	-.37	3.3	.11	.09		
4. SRL - Metacognitive Control & Adaptation	21.11	3.85	0.78	9	30	-0.59	3.65	.22	.16	.60	
5. SRL - Academic Social Engagement	10.11	2.83	0.71	3	15	-0.41	2.78	.39	.15	.22	.29

$p < .05$. ** indicates $p < .01$.
Note. Correlations are presented as descriptive indicators of relationships among variables. Given the exploratory nature of this analysis, the focus is on the magnitude of relationships rather than the statistical significance.

Low internal consistency suggests that the scale might not accurately reflect students' motivation appraisals, thus impacting its effectiveness in predicting outcomes like PWB. Together, these factors warrant a cautious interpretation of motivation appraisal's role in influencing PWB.

In summary, the findings from this study underscore the predictive value of the SRL practice, academic social engagement, on psychological well-being. The associations between this practice and psychological well-being are consistent with previous research by Davis (2020) and Kapil (2024), reinforcing the importance of academic social engagement in increasing psychological well-being among students. By highlighting the crucial role of academic social engagement in promoting psychological well-being, this study suggests that fostering strong social connections within the academic environment can be a key strategy and protective factor for enhancing students' psychological well-being.

Does stress mindset contribute to psychological well-being above and beyond the variability accounted for by SRL practices?

The findings indicate that stress mindset contributes to psychological well-being above and beyond the variability accounted for by SRL practices. Adding stress mindset to the regression model explained an additional 3.4% of variability in psychological well-being; a small yet meaningful contribution consistent with stress mindset theory (Dweck, 2000). Although stress mindset's impact on psychological well-being is modest, it highlights that perceiving stress as enhancing can positively influence students' mental health, complementing SRL practices.

Prior research integrating SRL practices, stress mindset, and psychological well-being is limited, though emerging studies like Kapil (2024) have begun to explore the interplays between these three variables.

Table 2

Hierarchical Multiple Regression Analysis Summary Predicting Psychological Well-Being (PWB) from SRL Practices and Stress Mindset

Variable	B	SEB	β	*t*	*p*	R^2	ΔR^2
Model 1						.168	
Intercept	14.19	2.09		6.77	< .001		
SRL - Motivation Appraisal	-0.13	0.19	-0.07	-0.67	.504		
SRL - Metacognitive Control & Adaptation	0.17	.11	0.15	1.55	0.124		
SRL - Academic Social Engagement	0.55**	.13	0.36	4.40	< .001		
Model 2						.202	.034
Intercept	9.40	2.86		3.29	< .01		
SRL - Motivation Appraisal	-0.12	0.19	-0.06	-0.66	0.512		
SRL - Metacognitive Control & Adaptation	0.15	.11	0.13	1.31	0.193		
SRL - Academic Social Engagement	0.52**	.12	0.34	4.20	< .001		
Stress Mindset	0.22**	.09	0.19	3.29	< .05		

Note. * indicates p < .05. ** indicates p <.01.

The results found in this study point to a possible role for stress mindset in the relationship between SRL and mental health and warrants further investigation to validate these results and broaden our understanding.

In conclusion, the study provides valuable insights into how SRL practices and stress mindset together influence psychological well-being among post-secondary students. Academic social engagement emerged as a significant predictor, aligning with previous research and suggesting that social connections within academic settings positively impacts PWB. The addition of stress mindset as a predictor, though moderate in effect, indicates that viewing stress-as-enhancing can complement SRL practices in promoting well-being. These findings underscore the complex and interrelated nature of these constructs, underscoring the relationships between SRL practices, stress mindset, and PWB as a key area for further empirical investigation.

Significance and Implications

This study contributes to educational theory, research, and practice by examining the roles of self-regulated learning practices, stress mindset, and psychological well-being within a post-secondary context. Although each of these variables has been well-studied individually, their interconnected effects have received less focus. The findings align with Winne and Hadwin's (1998) model of SRL by illustrating how SRL practices, or "operations", can influences psychological well-being as an "outcome", consistent with the COPES architecture. The integrated approach of this study contributes to a more holistic understanding of how academic and psychological factors work together to shape students' mental health, underscoring the value in addressing both learning strategies and stress perspectives in educational settings.

A connection between SRL practices, stress mindset and PWB, albeit modest, is

demonstrated in this study. This finding points to stress mindset as a possibly relevant factor in mental health outcomes for university students in academic environments and warrants further research to explore these interactions. Simultaneously, this study invites further research to explore these interactions utilizing advanced methodologies such as longitudinal and qualitative approaches. The use of more powerful analyses, such as statistical equation modeling (SEM), to validate complex interactions and casual relationships in diverse educational contexts is also an implication of this study.

The importance of fostering social connections in higher education academic environments is reinforced by the study's results which saw academic social engagement emerge as a strong predictor of psychological well-being. This should suggest to post-secondary institutions that student well-being should look beyond only academic interventions and instead expand to consider relational and community-building practices. By emphasizing these areas, educational institutions can create practical and targeted strategies that support students' mental health holistically. Collaborative partnerships between academic departments and student services might strengthen these efforts and yield a cohesive approach to student mental health that reaches both inside and outside the classroom. Further, the modest yet meaningful contribution of stress mindset to PWB suggests that students' perception of stress, specifically the perception that stress-is-enhancing, can simultaneously compliment SRL practices in supporting student's psychological well-being. The implications from these results could include refining the design of existing intervention programs to cultivate engagement in academic social practices, as well as fostering a stress-is-enhancing mindset. Supporting students' SRL practices and stress mindset development may contribute to students thriving both academically and psychologically.

In conclusion, this study suggests the interconnected roles of self-regulated learning practices and stress mindset in supporting psychological well-being in post-secondary students. By highlighting the significance of academic social engagement, the findings suggest that initiatives targeting students' overall well-being should include both academic and relational elements. The small but noteworthy influence of stress mindset further emphasizes that students' perceptions of stress play an important role in mental health outcomes, complimenting the influence of SRL practices. An opportunity exists to conduct future research that employs different methodology and strong analysis approaches to deepen our understanding of these relationships, particularly to examine their dynamic nature over time. Ultimately, the results should encourage post-secondary institutions to adopt a holistic and comprehensive approach to student mental health outcomes that occurs both within and beyond the classroom and encourage researchers to follow-up on these interesting results with more comprehensive investigation.

Limitations and Future Research

Limitations

Sample and Self-Report Scales. This study's 141 participants were post-secondary students who self-enrolled in a learning-to-learn course, potentially introducing selection bias, as these students may have been more motivated or invested in developing their learning strategies than the general student population. This selective sample limits the generalizability of the findings, as it may not represent the full diversity of post-secondary students. Additionally, the use of self-report measures for SRL practices, stress mindset, and psychological well-being introduces potential biases, such as social desirability and recall bias, which may impact the accuracy of responses. Self-assessments raise the concerns regarding consistency and honesty, as students might respond to measures in ways they perceive as favourable rather than accurate to

their experience. Lastly, while the sample size (N = 141) met the requirements for multiple regression analysis, it was relatively small for detecting subtle interactions. Ideally, future research explores the constructs and relationships identified in this thesis with a larger sample in new contexts.

Timing of Assessments and Attrition. A notable limitation of this study involves the timing of measurements. The study's design assessed SRL practices early in the semester, which might not capture the evolution of these practices over time. Student engagement and learning strategies can shift significantly throughout the academic term, meaning that early assessments may not reflect later changes influenced by academic demands or experiences or shifts in personal well-being. Additionally, the grounding conceptualization of mindset theory (Dweck, 2000) is that mindsets are malleable and subject to change. The same limitations that exist when assessing SRL practices once in the term also apply to assessing stress mindset once in the term. Furthermore, participant attrition across the study could influence the results, as students who completed all measures might differ in meaningful ways from those who did not, potentially skewing the data towards those who are more engaged in the academic environment.

Confounding Variables and Intervention Effects. The study did not control for all potential confounding variables that might influence SRL practices, stress mindset, and psychological well-being. Factors such as prior academic, external stressors, or personal support systems could have impacted these variables, contributing to unexplained variance in the results. Additionally, the effects of the learning-to-learn course itself may have altered students' SRL practices and stress mindset, complicating the interpretation of whether observed changes were due to naturally occurring shifts or were intervention-driven. These uncontrolled influences limit the ability to isolate the effects of SRL practices and stress mindset on psychological well-being.

Measurement Limitations. The SRL and stress mindset scales used in this study presented specific measurement limitations, particularly the motivation appraisal subscale, which showed low internal consistency (Cronbach's alpha = 0.66). This lower consistency raises questions about whether the motivation appraisal subscale accurately reflects the construct it intends to measure, impacting its predictive validity. Additionally, simultaneously to the present research Kapil (2024) found that the stress mindset measure (SMM) assumes alignment between individuals' general beliefs about stress and their lived experience, which may not be true for each participant. While the SMM may provide valuable insight in stress mindset, there are valid critiques of the scale and its effectiveness that warrant further investigation.

Design and analysis. Another limitation of the present study is the design and analysis. The correlational design with self-report measures meant data was collected at single points throughout the semester and, as a result, did not allow conclusions to be drawn regarding causality or the directionality of relationships between variables. The SRL-PSD tool (Hadwin et al., 2021) is also a recently developed measure, has been refined since the present research began. The 2021 SRL-PSD tool contains several scales (e.g. practices, challenges, etc.) with their own subscales, which presents another limitation in the fact that subscales of the practices scale were used independently from the scale as a whole. Further, two of the three SRL practices subscales utilized in this study contain a small number of items (e.g., motivation appraisal and academic social engagement). These considerations might affect the validity of the findings. Finally, a regression analysis is more susceptible to multicollinearity than other analyses, resulting in limits related to the accuracy of the data. Last, it is essential to note that the focus of this study as a master's thesis limits its scope and size.

Future Research

Research Design. Future research might benefit from conducting longitudinal designs that assess the variables at multiple points across a term or year, as it is critical to capture the dynamic fluctuations that occur over time in SRL practices, stress mindset, and psychological well-being. This approach could provide valuable insights into how these relationships change over time and offer insights into casual directions. Examining temporal patterns in SRL and stress mindset across an academic year could yield insights into how these variables are affected by contextual stressorssuch as stress levels, academic deadlines and social support. A research approach that offers the opportunity to collect data at multiple points in the term and go beyond single-point assessments would be helpful to capture the nuanced relationships between these variables. For example, a longitudinal approach could track how stress mindset adapts to significant academic stressors, such as midterms, and how these changes impact SRL practices and psychological well-being.

Advanced Analytical Techniques. Future research should combine structural equation modelling (SEM), with longitudinal or real-time designs to examine pathways between variables, identifying mediating or moderating effects. This integration would strengthen the validation of theoretical models and clarify direct and indirect pathways.

Refinement of Measurement Tools. Given the observed limitations with the motivation appraisal and stress mindset scales, future research should prioritize the use of validated and refined tools. As the SRL-PSD tool evolves, researchers can leverage its updates to better assess constructs and ensure more accurate measurements. These advancements will enhance the reliability and validity of future findings, contributing to a deeper understanding of these variables. The ongoing development of this tool in real-time reminds us that this continues to be

an emerging area of study and suggests exciting findings may be in the near future as tools and measures become more refined.

Samples. Expanding research to include diverse and larger samples across various educational settings will improve the generalizability of findings. Such studies can explore whether the relationships observed in this study hold across different contexts, such as varying academic disciplines, institutional types, or cultural backgrounds. This would also help determine whether stress mindset and SRL practices function similarly or differently across subpopulations of students.

Mixed Methods Approaches. Incorporating qualitative methods into future research could illuminate students' lived experiences with SRL practices, stress mindset, and psychological well-being. By capturing the nuanced ways in which students navigate these factors, researchers can complement quantitative findings and develop more targeted interventions. For example, qualitative insights might reveal specific contextual triggers for student mindset fluctuations.

In conclusion, the limitations of this study highlight areas for cautious interpretations of findings and underscore the need for continued exploration of SRL practices, stress mindset, and psychological well-being in post-secondary students. Future research should aim to address these limitations by incorporating diverse samples, employing longitudinal and mixed methods designs, and using advanced analytical techniques to better understand the dynamic interactions between these three variables. Additionally, the use of refined measurement tools will enhance the accuracy of study results, allowing for richer insights into the unique roles of SRL practices, stress mindset, and psychological well-being. Together, these efforts hold potential to inform the development of targeted interventions, supporting students in higher education contexts.

Conclusion

This study provides a comprehensive examination of the interplay between self-regulated learning (SRL) practices, stress mindset, and mental health in post-secondary students. By demonstrating that both SRL practices and stress mindset are contributors to mental health, this research underscores the need for an integrative approach to student well-being in higher education settings. The findings reveal that SRL practices, particularly academic social engagement, serve as predictors of students' psychological well-being. Moreover, the study highlights the unique contribution of stress mindset, which contributed to psychological well-being above and beyond the variability accounted for by SRL practices.

This research supports previous work (Davis, 2020; Hadwin & Davis, 2019; Howell, 2009; Kapil, 2024) and contributes to a growing field that seeks to bridge the previously distinct constructs of SRL practices, stress mindset and mental health within the post-secondary context. The findings of this study point to SRL practices and stress mindset as factors in understanding students' mental health, and the opportunity arises to validate these findings with improved measures in new samples.

From a practical standpoint, the findings suggest that interventions aimed at enhancing students' mental health should create learning environments that emphasize collaboration, fun, and connectedness; components that are integral to psychological well-being. Additionally, promoting positive stress mindsets might further students' overall mental health and help them navigate challenges in their lives more effectively.

In summary, this study sought to address a gap in the literature by linking SRL practices and stress mindset with mental health. The findings, albeit modest, are interesting and offer a launch point for future research to explore these constructs with more refined measures. The

insights gained from this research can promote students' well-being by incorporating SRL practices and stress mindset into support the development of educational practices and interventions at the post-secondary level. Continued efforts to understand the many factors and contributors to student mental health is critical and will help us pave the way for educational environments that empower students to thrive academically and personally.

References

Adams, R. V., & Blair, E. (2019). Impact of time management behaviors on undergraduate engineering students' performance. *Sage Open*, *9*(1), https://journals.sagepub.com/doi/pdf/10.1177/2158244018824506.

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American psychologist*, *55*(5), 469. https://doi.org/10.1037/0003-066X.55.5.469

Artino, A. R., & Jones, K. D. (2012). Exploring the complex relations between achievement emotions and self-regulated learning behaviors in online learning. *The Internet and Higher Education*, *15*(3), 170–175. https://doi.org/10.1016/j.iheduc.2012.01.006

Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Multifaceted impact of self-efficacy beliefs on academic functioning. Child Development, 67(3), 1206-1222. https://doi.org/10.2307/1131888.

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child development*, *78*(1), 246-263.

Chiang, J. J., Lam, P. H., Chen, E., Miller, G. E., & Johnson, B. T. (2022). Psychological Stress During Childhood and Adolescence and Its Association With Inflammation Across the Lifespan: A Critical Review and Meta-Analysis. *Psychological Bulletin*, *148*(1–2), 27–66. https://doi.org/10.1037/bul0000351.

Cohen, J. (1992). A power primer. Psychological Bulletin, 112(1), 155-159. doi:10.1037/0033-2909.112.1.155.

Comrey, A. L., & Lee, H. B. (2013). *A first course in factor analysis*. Psychology Press.

Conley, C. S., Shapiro, J. B., Huguenel, B. M., & Kirsch, A. C. (2020). Navigating the college years: Developmental trajectories and gender differences in psychological functioning, cognitive-affective strategies, and social well-being. *Emerging Adulthood*, *8*(2), 103-117.

Crum, A.J., Salovey, P. & Achor, S. (2013). Rethinking stress: The role of mindsets in determining the stress response. *Journal of Personality and Social Psychology*, *104*(4): 716–733. https://doi.org/10.1037/a0031201.

Crum, A. J., Akinola, M., Martin, A., & Fath, S. (2017). The role of stress mindset in shaping cognitive, emotional, and physiological responses to challenging and threatening stress. *Anxiety, stress, & coping*, *30*(4), 379–395.

Davis, S. (2020). *Optimizing mental health for student success at university: A case for self-regulated learning.* (Doctoral Dissertation). University of Victoria, B.C., Canada.

Davis, S. & Hadwin, A. (2021). Exploring differences in psychological well-being and self-regulated learning in university student success. *Frontline Learning Research, 9*(1), 30–43. https://doi.org/10.14786/flr.v9i1.581

Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random House.

Efklides, A. (2011). Interactions of metacognition with motivation and affect in self-regulated learning: The MASRL model. *Educational psychologist*, *46*(1), 6–25.

Fein, E.C. *et al.* (2022) *Section 5.3: Multiple regression explanation, assumptions, interpretation, and write up*, *Statistics for Research Students*. Available at: https://usq.pressbooks.pub/statisticsforresearchstudents/chapter/multiple-regression-assumptions/ (Accessed: 10 November 2024).

Green, S. B. (1991). How many subjects does it take to do a regression analysis? *Multivariate Behavioral Research*, *26*(3), 499–510. https://doi.org/10.1207/s15327906mbr2603_7

Hadwin, A. F., Rostampour, R., & Winne, H. P. (2024). *Advancing self-reports of self-regulated learning: Validating new measures to assess students' beliefs, practices, and challenges*. Manuscript submitted for publication.

Hadwin, A. & Winne, P. H. (2012). Promoting learning skills in undergraduate students. *Enhancing the quality of learning: Dispositions, instruction, and mental structures*, pp. 201–227.

Hadwin, A.F., Sukhawathanaku, l P., Rostampour, R. and Bahena-Olivares, L.M. (2022). Do Self-regulated learning practices and intervention mitigate the impact of academic Challenges and covid-19 distress on academic performance during online learning? *Front. Psychol.* 13:813529. doi 10.3389/fpsyg.2022.813529

Huebschmann, N. A., & Sheets, E. S. (2020). The right mindset: stress mindset moderates the association between perceived stress and depressive symptoms. *Anxiety, Stress, & Coping*, *33*(3), 248-255.

Howell, A. J. (2009). Flourishing: Achievement-related correlates of students' well-being. *The Journal of Positive Psychology, pp. 4*, 1–13. Doi: 10.1080/17439760802043459.

Jansen, R. S., Van Leeuwen, A., Janssen, J., Jak, S., & Kester, L. (2019). Self-regulated learning partially mediates the effect of self-regulated learning interventions on achievement in higher education: A meta-analysis. *Educational Research Review*, *28*, https://www.sciencedirect.com/science/article/pii/S1747938X18304342.

Jun, W. H., Yang, J., & Lee, E. J. (2018). The mediating effects of social support and a grateful disposition on the relationship between life stress and anger in Korean nursing students. *Asian Nursing Research*, *12*(3), 197-202.

Kapil, M. E. (2024). *Doing well and feeling well: Investigating the contributions of two stress-related appraisals and regulatory practices on student success outcomes*. [Doctoral dissertation, University of Victoria]. UVicSpace. https://hdl.handle.net/1828/16455.

Kapil, M., Rostampour, R. & Hadwin, A. (2022). *Mental Health, Stress Regulation and Self-Regulated Learning (SRL): Personal and Academic Processes in University Student Success*. Paper session presented at the annual meeting of the Canadian Society for the Study of Education Conference Online 2022. Role: Conceptualization, research, writing, analysis.

Kapil, M., Rostampour, R., & Hadwin, A. (2024). Coping Self-Efficacy and Stress Mindset as Predictors of Student Success Outcomes. *Journal of Postsecondary Student Success.*, *4*(1), 147–172. https://doi.org/10.33009/fsop_jpss135208

Keech, J. J., Cole, K. L., Hagger, M. S., & Hamilton, K. (2020). The association between stress mindset and physical and psychological wellbeing: Testing a stress beliefs model in police officers. *Psychology & Health*, *35*(11), 1306-1325.

Kessler RC, Amminger GP, Aguilar-Gaxiola S, Alonso J, Lee S, Ustun TB. Age of onset of mental disorders: a review of recent literature. Curr Opin Psychiatry 2007; 20: 359–64.

Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. Journal of Health and Social Behavior, 43(2), 207222. https://doi.org/10.2307/3090197

Keyes, C. L. M. (2009). Atlanta: Brief description of the mental health continuum short form (MHC-SF). Retrieved from: https://www.aacu.org/sites/default/files/MHCSFEnglish.pdf

Kim, Y. E., Yu, S. L., Wolters, C. A., & Anderman, E. M. (2023). Self-regulatory processes within and between diverse goals: The multiple goals regulation framework. *Educational Psychologist*, 1-22.

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling* (3rd ed.). New York: Guilford Press.

Knoesen, R., & Naude, L. (2018). Experiences of flourishing and languishing during the first year at university. *Journal of Mental Health (Abingdon, England)*, *27*(3), 269–278. https://doi.org/10.1080/09638237.2017.1370635

Larsen, L., Schauber, S.K., Holt, T. *et al.* Longitudinal Covid-19 effects on child mental health: vulnerability and age dependent trajectories. *Child Adolesc Psychiatry Ment Health* **17**, 104 (2023). https://doi.org/10.1186/s13034-023-00652-5

Ma, X.-F., Hou, G.-Q., & Luo, W.-X. (2020). A survey on depression prevalence and influencing factors among junior high school students in Jinshan District of Shanghai. Occupation and Health, 36(13), 1831– 1836. https://doi.org/10.13329/j.cnki.zyyjk.2020.0487.

Mason, A. E., Adler, J. M., Puterman, E., Lakmazaheri, A., Brucker, M., Aschbacher, K., & Epel, E. S. (2019). Stress resilience: Narrative identity may buffer the longitudinal effects of chronic caregiving stress on mental health and telomere shortening. *Brain, behavior, and immunity*, *77*, 101-109.

Meyer, H. H., & Stutts, L. A. (2024). The effect of mindset interventions on stress and academic motivation in college students. *Innovative Higher Education*, *49*(4), 783–798. https://doi.org/10.1007/s10755-024-09706-8.

Mishra, S. (2020). Social networks, social capital, social support and academic success in higher education: A systematic review with a special focus on 'underrepresented' students. *Educational Research Review*, *29*, 100307.

Moghimi, E., Stephenson, C., Gutierrez, G (2023). Mental health challenges, treatment experiences, and care needs of post-secondary students: a cross-sectional mixed-methods study. *BMC Public Health 23*(655).https://doi.org/10.1186/s12889-023-15452-x

Montgomery, D. C., Peck, E. A., & Vining, G. G. (2012). *Introduction to linear regression analysis* (Fifth edition.). John Wiley & Sons Ltd. Retrieved from https://ebookcentral-proquest-com.ezproxy.library.uvic.ca/lib/uvic/detail.action?docID=7103892&pq-origsite=primo

Pidgeon A., McGrath S., Magya H.B., Stapleton P., Lo B.C.Y. (2014). Psychosocial moderators of perceived stress, anxiety, and depression in university students: An international study. *JSS. 02*(11):23–31. Doi: https://doi-org.ezproxy.library.uvic.ca/10.4236/jss.2014.211004.

Pintrich, P. R., Smith, D., Garcia, T., McKeachie, W. A. (1991). Manual for the motivated strategies for learning questionnaire (MSLQ). Ann Arbor: University of Michigan. Retrieved from: https://files.eric.ed.gov/fulltext/ED338122.pdf.

Rohrkemper, M. M. (1989). Self-regulated learning and academic achievement: A Vygotskian view. *Self-regulated learning and academic achievement: Theory, research, and practice*, 143-167.

RStudio Team. (2024). RStudio: Integrated Development for R (Version 1.4) [Computer software]. RStudio, PBC. http://www.rstudio.com/.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. Journal of Personality and Social Psychology, 57(6), 10691081. https://doi.org/10.1037/0022-3514.57.6.1069.

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*(4), 719–727. https://doi.org/10.1037/0022-3514.69.4.719.

Romano, E., Babchishin, L., Marquis, R., & Fréchette, S. (2015). Childhood maltreatment and educational outcomes. Trauma, Violence & Abuse, 16(4), 418–437. https://doi.org/10.1177/1524838014537908

Schreiber, C., Schotanus-Dijkstra, M (2024). Enhancing mental wellbeing by changing mindsets? Results from two randomized controlled trials. *BMC Psychol 12*(77). https://doi.org/10.1186/s40359-023-01470-2.

Secules, S., McCall, C., Mejia, J. A., Beebe, C., Masters, A. S., L. Sánchez-Peña, M. L., & Svyantek, M. (2021). Positionality practices and dimensions of impact on equity research: A collaborative inquiry and call to the community. *Journal of Engineering Education*, 110(1), 19–43.

Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian psychologist*, *45*(4), 249-257. https://doi.org/10.1080/00050067.2010.482109

Teicher, M. H., & Samson, J. A. (2013). Childhood maltreatment and psychopathology: A case for ecophenotypic variants as clinically and neurobiologically distinct subtypes. The American Journal of Psychiatry, 170(10), 1114–1133. https://doi.org/10.1176/appi.ajp.2013.12070957.

Van Nguyen, H., Laohasiriwong, W., Saengsuwan, J., Thinkhamrop, B., & Wright, P. (2015). The relationships between the use of self-regulated learning strategies and depression among medical students: An accelerated prospective cohort study. Psychology, Health & Medicine, 20(1), 59–70. https://doi.org/10.1080/13548506.2014.894640.

Varma, P., Junge, M., Meaklim, H., & Jackson, M. L. (2021). Younger people are more vulnerable to stress, anxiety and depression during COVID-19 pandemic: A global cross-sectional survey. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, *109*, 110236.

von der Embse, N., Jester, D., Roy, D., & Post, J. (2018). Test anxiety effects, predictors, and correlates: A 30-year meta-analytic review. Journal of Affective Disorders, 227, 483–493. https://doi.org/10.1016/j.jad. 2017.11.048

Wang C., Pan R., Wan X., Tan Y., Xu L., Ho C. S., and Ho R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, 17(5), Article 1729. Crossref.

Wang, X., Zhang, J., Sun, X., & Zhang, L. (2022). Stress mindset and mental health status among Chinese high school students: The mediating role of exam stress appraisals. *PsyCh Journal*, *11*(6), 904–912. https://doi.org/10.1002/pchj.563

Wiedemann, A., Jones, P.B. & Burn, AM. Impact of the COVID-19 pandemic on young adults' mental health and beyond: a qualitative investigation nested within an ongoing general population cohort study. *Soc Psychiatry Psychiatr Epidemiol* **59**, 2203–2213 (2024). https://doi.org/10.1007/s00127-024-02659-5

Winne, P. H. (1997). Experimenting to bootstrap self-regulated learning. J. Educ. Psychol. 89, 397–410. Doi: 10.1037/0022-0663.89.3.397

Winne, P. H., & Hadwin, A. F. (1998). Studying as self-regulated learning. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Metacognition in educational theory and practice* (pp. 277–304). Mahwah, NJ: Lawrence Erlbaum Associates.

Winne, P. H., & Jamieson-Noel, D. (2002). Exploring students' calibration of self reports about study tactics and achievement. *Contemporary Educational Psychology*, *27*(4), 551–572.

Winne, P. H., & Perry, N. E. (2000). Measuring self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), Handbook of self-regulation (pp. 531–566). Orlando, FL: Academic Press.

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample Size Requirements for Structural Equation Models: An Evaluation of Power, Bias, and Solution Propriety. *Educational and Psychological Measurement, 73*(6), 913–934. https://doi.org/10.1177/0013164413495237.

Wolters, C. A., & Brady, A. C. (2021). College students' time management: A self-regulated learning perspective. *Educational Psychology Review*, *33*(4), 1319-1351. https://link.springer.com/article/10.1007/s10648-020-09519-z

World Health Organization (WHO) (2022). *Mental health*. Retrieved from https://www.who.int/en/news-room/fact-sheets/detail/mental-health-strengthening-our-response.

Zimmerman, B. J. (1986). Becoming a self-regulated learner: Which are the key subprocesses? *Contemporary educational psychology*, *11*(4), 307-313.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, *81*(3), 329.

Zimmermann M. & Bledsoe C., Papa A. (2020). The impact of the COVID-19 pandemic on college student mental health: A longitudinal examination of risk and protective factors. *PsyArXiv*. Crossref.

Appendices

Appendix A: Scales

Table 1 Items in the SRL-Practices Subscale

Self-regulated learning Practices (SRL-P) Please *rate how true each statement is for you.* ***Over the last two weeks, when I did academic work, I...*** (Never true, rarely true, sometimes true, usually true, always true)	
Motivation Appraisal	Assessed if I think I can do it Assessed my feelings for the task Evaluated the effort I was putting in
Metacognitive Control & Adaptation	Changed my understanding of the task at hand Modified my plans for the task Switched to a different strategy or approach Changed my feelings about the task Altered the level of effort I put in Modified my beliefs about how well I would do my tasks
Academic Social Engagement	Got to know people in the class Had fun in university Helped classmates

Table 2 Psychological Well-Being (PWB) Items from Mental Health Continuum – Short Form (MHC-SF)

How often during the past month did you feel ...

9. That you liked most parts of your personality?
10. Good at managing the responsibilities of your daily life?
11. That you had warm and trusting relationships with others?
12. That you had experiences that challenged you to grow and become a better person?
13. confident to think or express your own ideas and opinions?
14. That your life has a sense of direction or meaning to it?

Table 3 Stress Mindset Measure (SMM)

Preliminary Questions (optional)

a. How much stress are you experiencing in your life right now?
(1=None, 4=A Moderate Amount, 7=An Extreme Amount)

b. What is the primary source of stress in your life?
(Open response)

c. How stressful do you perceive this to be?
(1=Not Stressful at All, 4=Moderately Stressful, 7=Extremely Stressful)

Stress Mindset Questions

Please rate how true each statement is for you:
(Scoring: use this scale for all 8)

1 = Never True
2 = Rarely True
3 = Sometimes True
4 = Usually True
5 = Always True

1. The effects of stress are negative and should be avoided. *
2. Experiencing stress facilitates my learning and growth.
3. Experiencing stress depletes my health and vitality. *
4. Experiencing stress enhances my performance and productivity.
5. Experiencing stress inhibits my learning and growth. *
6. Experiencing stress improves my health and vitality.
7. Experiencing stress debilitates my performance and productivity. *
8. The effects of stress are positive and should be utilized.

*Denotes reverse scoring.

Appendix B: Participant Letter of Implied Consent

EXPERIENTIAL LEARNING AND RESEARCH CONSENT

Why participate in research that evaluates student learning and the ED-D 101 Course?
In ED-D 101, you have the opportunity to experiment with your own learning in order to become a better learner. The information and practices that guide you through this process have been developed from theory and research about student learning. Each semester, ED-D 101 undergoes revisions based on findings from the ED-D 101 research. Learning experiences from a large number of students are needed to continue to improve the course. By participating in this research, you inform students, researchers, university instructors, and administrators who strive to help students succeed at university.

Purpose of the research

- To understand how to support students (like yourself) to become academically successful and develop lifelong learning skills.
- To compare learning processes and successes of ED-D 101 students with students who have not taken the course, and/or with students who received different types of support for developing their academic skills.
- To inform evidence-based decision making about ED-D 101 (expansion, course content, course activities).
- To inform theory and research about strategic regulation in educational psychology and educational technology.

Participation in this research involves:

- No additional work or time. Your regular coursework will be examined for research purposes after the course is completed and final grades have been submitted. Data include:
  - ED-D 101 course assignments, lab activities, tests, and discussions (online or audio/video recorded).
  - ED-D 101 Brightspace data including activity reports;
  - Data gathered through a mobile application, Metricwire, used for your studying and collaborative work in ED-D101, and
  - Institutionally collected performance indicators (e.g. GPA, yearly GPA, and exit surveys) throughout your undergraduate degree
- There are no known or anticipated risks.

Participation is voluntary: You can withdraw at anytime

By taking this course, you are automatically included in ED-D 101 research. However, you may withdraw anytime this semester by clicking on the electronic consent form in Brightspace and indicating "decline to participate" or copying and pasting this link into a browser: https://www.surveymonkey.ca/r/edd101202001. In the case of group work, withdrawal of participation will mean that an individual's contributions to the group will not be examined. When individuals cannot be removed completely from the data sets (e.g., group project grade or shared planning forms), data will be used in summarized form with no identifying information. Course instructors will not know that you have withdrawn consent until after course completion and grade submission. Your participation in this research will not influence your grade in the course.

Data will be confidential even though coursework is not anonymous
Course assignments and activities with your name or student ID are not anonymous. However, your confidentiality will be protected by (1) summarizing data in a spreadsheet with a random case number whenever possible and (2) summarizing data across many students or using pseudonyms when specific examples are used.

Course instructors will not know you are participating in this research
Instructors and teaching assistants will not know who has consented to participate in the research during the semester. Consent forms will be collected by a third party and released to the research team after course completion and grade submission.

What will happen to data and how will findings be reported and shared?

Electronic data will be archived and stored on a password protected server only accessible to the researchers. Files will be stored for approximately 10 years, after which they will be erased. Paper-based data will be stored in a locked filing cabinet in Maclaurin A210 for 10 years, after which they will be shredded. Data will be analyzed by Dr. Hadwin and her research collaborators. Findings will be presented through academic publications/presentations, the research website (http://allysonhadwin.wordpress.com/), student theses, and reports to university administrators. Identifying information will be removed whenever examples are used in ED-D 101 or presentations.

Social Networking Privacy Notice

Some activities/assignments in this course use social networking platforms such as Google. Please be advised that data collected within these platforms are likely stored on servers located outside of Canada. As a result, retention, access to, and the secondary use and disclosure of any personal information you disclose are subject to the social networking site's terms of use, privacy policies and foreign law. You are encouraged to read the social networking site's terms and conditions on their website prior to starting any activities. Students are encouraged to use first name and last initial only when using these networking tools.

UVic cannot require students to disclose personal information to technologies or organizations which may store information on servers located outside of Canada because disclosure of personal information to vendors, systems or services storing or accessing that personal information outside of Canada is restricted by Section 30.1 of BC's Freedom of Information and Protection of Privacy Act (FIPPA). Personal information is information about an identifiable individual; for example, your name or your email address. If you are not comfortable with your personal information being stored outside of Canada, you may sign up for the tool using a nickname and non-identifying email. However, you will be required to inform your instructor of the nickname and non-identifying email.

Mobile and External Application Privacy Notice

Self-study activities will draw on survey tools that provide immediate feedback to learners. Two tools will be integrated in course activities for this purpose: (1) MetricWire is an app you use on your phone to plan and reflect on studying. (2) LimeSurvey is a web application used for questionnaires and surveys. Data are stored for a maximum of 1 year on a secure server in Canada built to comply with BC's Freedom of Information and Protection of Privacy Act (FIPPA). Data will be tied to a keycode without any personal identifiers. Data collected within this app cannot be sold to other third-party individuals or organizations If you choose not to use these tools, your self-study activities will be done in excel spreadsheets and you will generate your own summaries of scores for your SRL report.

Contacts

Feel free to contact any of the following with questions, comments, or concerns:

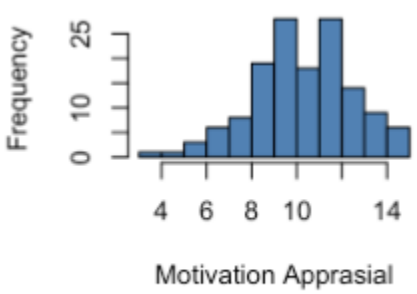
- During the course: Dr. Mariel Miller (fgage@uvic.ca) or Dr. Andreotti (deaneduc@uvic.ca)
- After the course: Dr. Allyson Hadwin (hadwin@uvic.ca) [Note: Do not contact me during the course because course instructors cannot know which students are participating until course grades are submitted.]
- Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

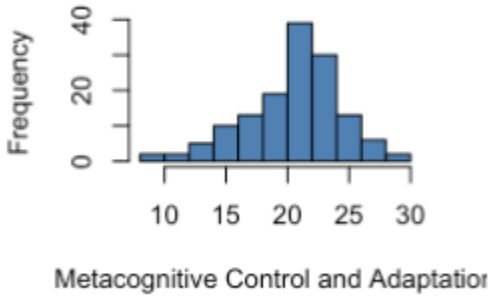
This research (Par-IT: Promoting Adaptive Regulation with Innovative Technologies) is led by Dr. Allyson Hadwin (Principal Investigator) and (Advancing educational theory, assessment, and practice in higher education collaborative regulatory training) is led by Dr. Jason Harley from McGill Univeristy (PI) and Dr. Allyson Hadwin and Dr. Mariel Miller (Co-I). Both grants are funded by the Social Sciences and Humanities Research Council of Canada (SSHRC) and the Canadian Foundation for Innovation (CFI-LOF).

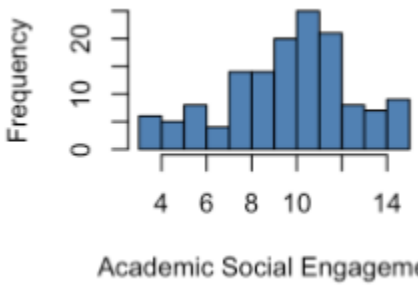
By registering in ED-D 101, you are automatically included in research about student learning and success. You may withdraw anytime this semester by clicking on the electronic consent form [https://www.surveymonkey.ca/r/3JM5PHG?] in Brightspace and indicating "decline to participate Or, print and sign this form and send in campus mail to: PAR-IT research coordinator, MacLaurin Building, A210. Your signature below indicates that you would like to withdraw your consent from research in ED-D 101.

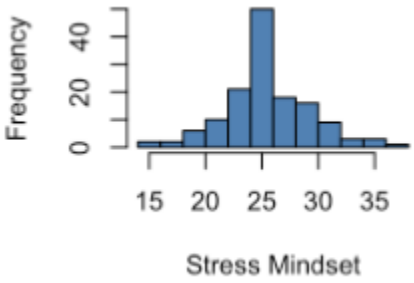
Name _____ Signature _____ Date _____

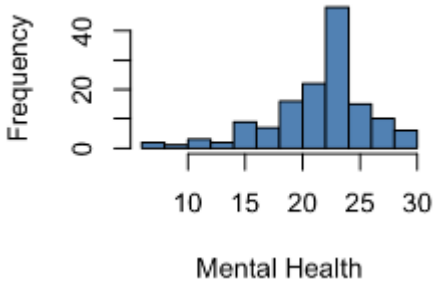
Appendix C: Histograms of all Variables





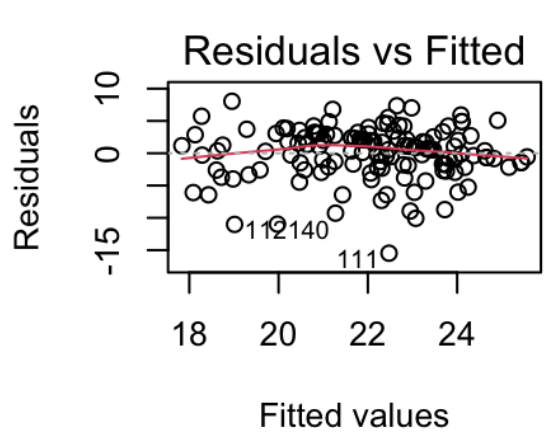


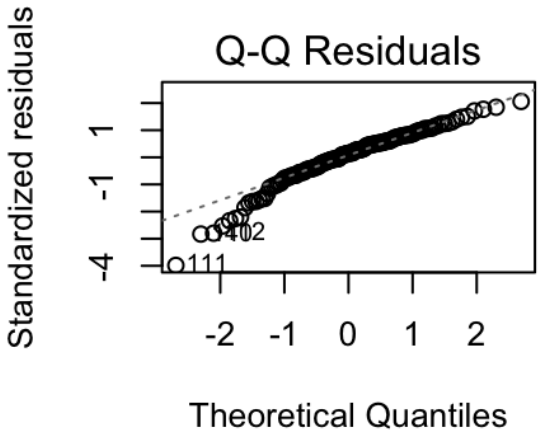


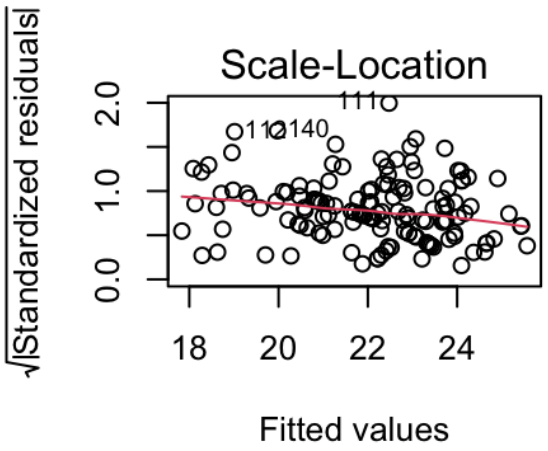


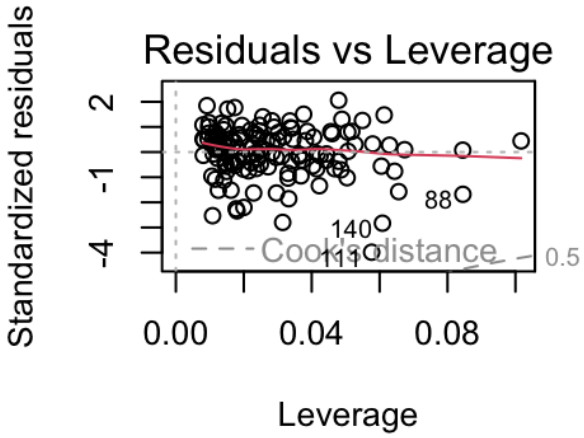
Appendix D: Regression Model 1 – Assumptions

SRL practices predicting mental health assumptions.


Residuals vs Fitted
Residuals
Fitted values
18
20
22
24
-15
0
10
112
140
111

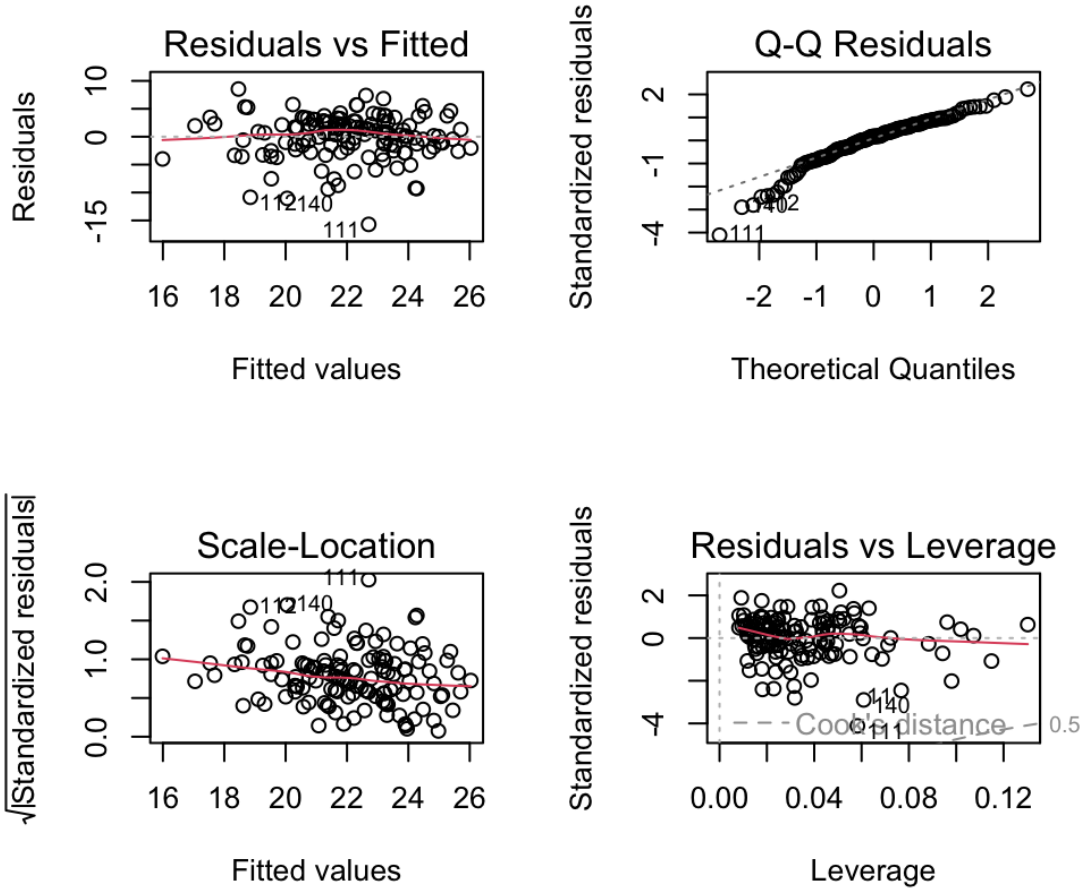

Q-Q Residuals
Standardized residuals
Theoretical Quantiles
-2
-1
0
1
2
-4
-1
1
140
2
111


Scale-Location
√|Standardized residuals|
Fitted values
18
20
22
24
0.0
1.0
2.0
111
112
140


Residuals vs Leverage
Standardized residuals
Leverage
0.00
0.04
0.08
-4
-1
2
88
140
111
Cook's distance
0.5

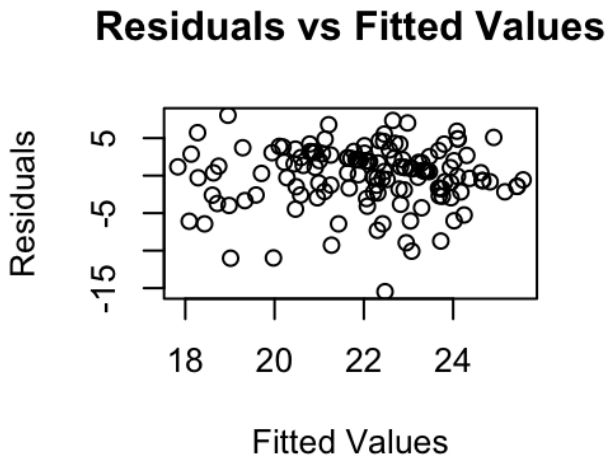
Appendix E: Regression Model 2 – Assumptions

SRL practices and stress mindset predicting mental health assumptions.



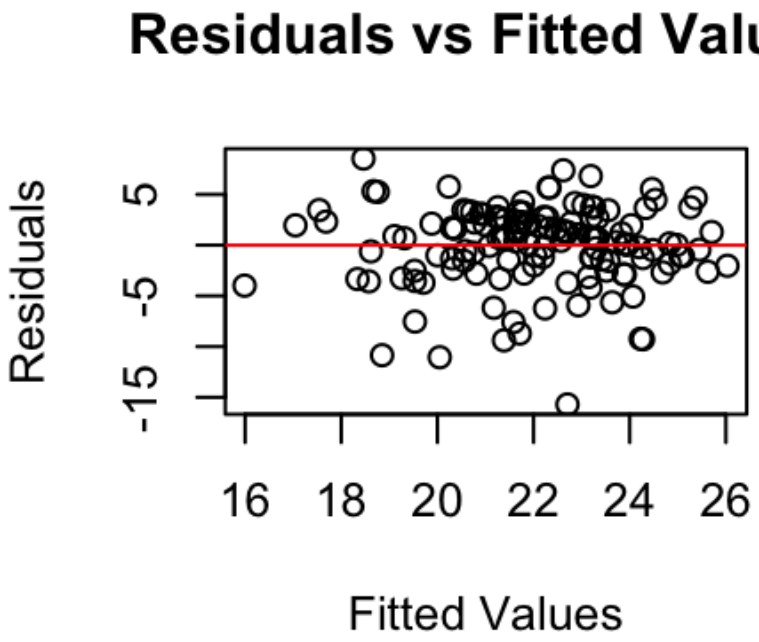
Appendix F: Regression Model 1 – Regression Residuals

SRL practices predicting mental health regression residuals.



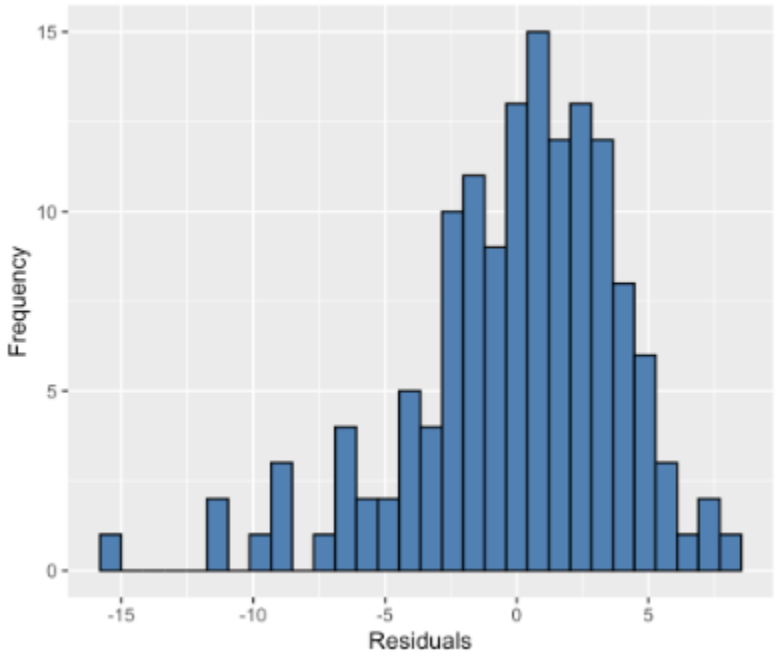
Appendix G: Regression Model 2 – Regression Residuals

SRL practices and stress mindset predicting mental health regression residuals.



Appendix H: Regression Model Histograms

Histogram of SRL practices predicting mental health.



Histogram of SRL practices and stress mindset predicting mental health.