

The Mediation Effect of Mindset and Disordered Social Media Use on Perfectionism and Psychological Distress Symptoms

by

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## Abstract

Research has found that perfectionism is associated with intense rumination about making mistakes, constant self-doubt, harsh self-criticism, as well as unreasonably high expectations (Rice, Richardson, & Clark, 2012), and these tend to significantly increase over time if treatment is not forthcoming (Curran, & Hill, 2019). A promising factor that could help to mitigate these negative symptoms is mindset, which is generally defined as an individual's beliefs about the malleability of certain traits they hold, such as intelligence, personality, anxiety, or emotion. Chan (2012) theorizes that perfectionists who adopt a growth mindset, or believe that their traits can change, might be less threatened by inconsistencies between their expectations and performance and are better able to handle and learn from failure. This research study had 239 participants complete scales of perfectionism, psychological distress symptoms, mindset, and social media use to assess the direct and indirect effects of social media use and mindset as potential mediators of the relationship between perfectionism and psychological distress. Results show that an individual's specific mindset about anxiety significantly mediated the relationship between perfectionism and psychological distress. The current research may offer preliminary evidence as to the factors influencing maladaptive vs. more adaptive forms of perfectionism.

## Preface

This thesis is an original work by Adrian Johnson. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name “Perfectionism and Impact of Mindset”, with the REB ID: Pro00099231, May 29th, 2020.

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## Introduction

Research on perfectionism completed by Flett and Hewitt (2002) defines perfectionism as striving for flawlessness, which, depending on the individual, may span a variety of life domains. While many different conceptualizations and definitions of perfectionism have been posited, this introduction will cover some of the negative and positive aspects of perfectionism found in past research, briefly cover researched treatments for perfectionism, and then relate perfectionism literature to relevant constructs such as psychological distress, social media use, and mindset.

High levels of perfectionism may have many negative aspects, the symptoms of which have been termed maladaptive perfectionism. Maladaptive perfectionism is characterized by intense rumination about making mistakes, constant self-doubt, harsh self-criticism, and unreasonably high expectations. It has been shown to decrease mental health, job performance, as well as negatively affect relationships (Rice, Richardson, & Clark, 2012). It has also been found to negatively impact individuals through disturbances with work, as well as self-imposed demands for superior achievements (Dunn, Whelton, & Sharpe, 2006). Maladaptive perfectionism is linked to reduced engagement in preventative health behaviours, life satisfaction and well-being, along with higher psychological distress and self-concealment (Williams, & Cropley, 2014).

While maladaptive perfectionism creates distress and mental illness, research has also explored the positive qualities of more adaptive forms of perfectionism. Adaptive perfectionism is characterized by more flexibility in how individuals perceive making errors. Individuals with this personality style are able to view their efforts, even failing efforts, as satisfying and valuable as opposed to those with maladaptive perfectionism, which is always driven by an intense fear of failure (Hamachek, 1978). While both types of perfectionism exhibit high organization, personal

standards, conscientiousness, and desire to reach personal goals (Slade, & Owens, 1998), adaptive perfectionism has been correlated with lower levels of rumination, negative affect, and negative self-critical evaluations (Bieling, et al., 2004). Adaptive perfectionism has also been linked to possible health benefits, as well as adaptive personality traits, such as higher conscientiousness (Fry, & Debats, 2009).

Research to date has not fully addressed the practical distinction between maladaptive and adaptive perfectionism in how they correlate to other emotional disturbances or how treatment can consistently shift these highly negative maladaptive behaviours into more adaptive and supportive ones. Seminal research from Hewitt and Flett (1989, 1991) emphasized the multidimensional aspects of perfectionism, and categorized it within three domains. These domains include self-oriented, other-oriented, and social prescribed perfectionism. Self-oriented perfectionism emphasizes high personal standards, other-oriented perfectionism focuses on expectations of others, and socially prescribed perfectionism addresses the high standards that others, or society places on them. Although perfectionism is associated with increased successful life outcomes, it does not improve life satisfaction (Mor, Day, Flett, & Hewitt, 1995). Greenspon (2008) argues that individuals with perfectionism who are circumstantially able to dampen their concern for doing well are more capable of succeeding. These researchers posit that talent, energy and commitment are the determinants of success and that these traits are separate from perfectionism. From their perspective, perfectionism is a deterrent of success that individuals can overcome, and not a factor contributing to their success. Experimental research has found that high anxiety symptoms associated with perfectionism can impair performance, so in one sense, the positive potential outcomes of perfectionism may not be directly associated and should not be confused with adaptive perfectionism (Greenspon, 2008). It is still a debate within the literature

if adaptive perfectionism may reflect more conscientiousness and achievement-oriented goals instead of trait perfectionism. Greenspon (2008) deduced that real perfectionism can be distinguished behaviourally, as an individual will be acting out of seemingly endless amounts of energy with the goal to improve themselves. This stems from the desire and motivation to be perfect as well as avoid small imperfections, which includes the perception that near perfection is not good enough. Qualitative research reviewed by Greenspon (2008) depicts the core fear of imperfection as a lack of self-acceptance. These individuals fear that they are not acceptable to their peers, which is a fear rooted in their self-concept that interferes with their social relationships.

To assess developmental models that may fit within the framework of perfectionism, this introduction will review the promising field of mindset. Dweck (1999) began this area of research by proposing that individuals may hold self-theories and that these implicit theories may influence their views of intelligence. This in turn affects how they respond to challenges, which then alters their motivation and achievement. In subsequent research, Dweck (2006) expanded this notion of self-theories to mindsets to cover a broader range of domains outside of intelligence or intellectual ability. Mindsets can be generally defined as an individual's mental outlook or state of mind that influences their attitudes and behaviours (Fang, Kang, & Liu, 2004). This literature review will include the history and conception of mindsets, the broad range of topics and beliefs it has covered, how it has been used with treatment, and finally its relation to relevant constructs like psychological distress, social media use, and perfectionism.

Mindsets may influence the impact of failure and Dweck (2016, 2015) studied the impact of mindsets in young people trying to learn complex new material. Those children that were more flexible in their ability to handle failure, and those that viewed the acquisition of new

material as a process to achieve over time, were much more capable of grasping the material, and more importantly, had less negative affect while struggling to learn it. An individual's mindset and how they react to failure has been shown to influence motivation in relation to the acquisition of new skills or partaking in a new challenge (Rattan, Savani, Chugh, & Dweck, 2015). Within this tradition of research, two opposing mindsets have been defined: a growth mindset and a fixed mindset. A growth mindset is the belief that individual characteristics, like intelligence or personality, can be developed and changed over time; whereas a fixed mindset is the belief that these traits are fixed and unchangeable. An individual with a growth mindset is more likely to explain their failure as due to a lack of effort, as well as approach tasks with the goal of gaining mastery gradually over time. Alternatively, individuals with a fixed mindset attribute personal failure to a lack of abilities as well as see their ability as set and immutable (Schroder, Callahan, Gornik, & Moser, 2019).

Although mindsets of intelligence and personality have been examined previously, new research is emerging related to anxiety and the malleability of this self-belief. Within the domain of anxiety, previous research supports the notion that positive mindsets can increase resiliency in individuals with mental health challenges. Specifically, participants that have a growth mindset about their anxiety experience fewer symptoms of stress, depression, and substance use compared to those with more fixed mindsets (Schroder, Yalch, Dawood, et al., 2017). Schroder, Callahan, Gornik, and Moser (2019) conducted a longitudinal study in which they examined individuals' mindsets related to their anxiety. Those with fixed mindsets about their anxiety, believing that it is unchangeable, were found to have greater psychological distress in the future, even when controlling for sex, socioeconomic status, the previous week's distress, baseline depression symptoms, and presence of psychiatric diagnosis.

Chan (2012) used the Almost Perfect Scale-Revised to classify Chinese gifted students into non-perfectionists, unhealthy perfectionists, and healthy perfectionists. He then compared these groups in terms of mindset and well-being and theorized about supportive interventions. Healthy perfectionists were found to be the happiest and the most satisfied with life generally, whereas unhealthy perfectionists were found to score higher on fixed mindset. This research challenged the stereotyped pathological perspective of perfectionism for a more nuanced understanding of factors contributing to more adaptive forms of perfectionism. Chan (2012) theorized that perfectionists that adopt a growth mindset might be less threatened by inconsistencies between their expectations and performance. With this theory in place, interventions may allow unhealthy perfectionism to maintain their anticipations, and not lower their expectations, but more strategically change their mindsets to lower the subjective distress of natural limitations and the discrepancy between standards and objective outcomes. While theories and research of mindset tend to polarize the two extremes, Chan (2012) proposes that they are not mutually exclusive. Within their research, they found only a moderate significant negative correlation between growth and fixed mindsets. They also note that there is constantly a complex interplay of differing beliefs that an individual may hold. It may be the case that an individual with high perfectionism can hold a general growth mindset, however, has domain specific fixed mindsets.

From the previous literature review, it logically follows that there should be a relationship between perfectionism and psychological distress directly, and this is what research has shown (Egan, Piek, Dyck, Rees, & Hagger, 2013). It is also expected that perfectionism may be related to a more fixed mindset, which could subsequently relate to higher psychological distress

symptoms. The current research will explore mindset as a potential mediator between perfectionism and psychological distress symptoms, such as stress, anxiety, and depression.

Past research by Fioravanti, Flett, Hewitt, Rugai, and Casale (2020) has found a connection between maladaptive cognitions and excessive social media use. Considering this research finding, a secondary research goal of our study is to uncover if social media use may also mediate the relationship between perfectionism and psychological distress.

## Literature Review

Modern capitalistic society is built to encourage high aspirations and striving for greatness; however, the harsh reality is that there is an epidemic of perfectionism leaving an unachievable and crippling set of expectations in its wake. Young adults are experiencing ever increasing levels of depression, with little to no change in mental health treatments causing insufficient access to treatment services (Mojtabai, Olfson, & Han, 2016). This pressure has intensified with the ever-present use of social media through which individuals can rank themselves compared to their peers, creating the need to make themselves and their lifestyles perfect (McBain, 2018). One fifth to one third of high school and college students have been shown to have maladaptive perfectionism (Boone, Soenens, Braet, & Goossens, 2010); which has resulted in an outcry of despair and desperation found in drug addiction, and suicide being the leading cause of death in teenagers and young adults (McBain, 2018). Research has found that perfectionism has significantly increased over time and predict it will continue to increase if research and treatment are not forthcoming (Curran, & Hill, 2019).

### **Perfectionism**

Flett and Hewitt (2002) define perfectionism as striving for flawlessness, which, depending on the individual, may span a variety of life domains. While many different conceptualizations and definitions have been posited, this introduction will cover some of the negative and positive aspects of perfectionism found in past research, briefly cover researched treatment, and then relate perfectionism literature to relevant constructs such as psychological distress, social media use, as well as mindset.

Seminal research from Hewitt and Flett (1989, 1991) emphasized the multidimensional aspects of perfectionism, and showed that there are three fundamental aspects of perfectionism. These aspects include self-oriented, other-oriented, and social prescribed perfectionism. Self-oriented perfectionism emphasizes high personal standards, other-oriented perfectionism focuses on expectations for others, and socially prescribed perfectionism addresses the high standards that significant others, or society places on them. At high levels of perfectionism, many negative consequences of perfectionism may be present, and research has used the term maladaptive perfectionism to describe these symptoms. Maladaptive perfectionism is characterized by intense rumination about making mistakes, constant self-doubt, harsh self-criticism, and unreasonably high expectations. It has been shown to decrease mental health, and job performance as well as negatively affect relationships (Rice, Richardson, & Clark, 2012). It has also been found to negatively impact individuals through disturbances with work, as well as self-imposed demands for superior achievements (Dunn, Whelton, & Sharpe, 2006). Maladaptive perfectionism is linked to reduced engagement in preventative health behaviours, life satisfaction and well-being, as well as higher psychological distress and self-concealment (Williams, & Cropley, 2014).

While maladaptive perfectionism creates distress and mental illness, research has explored the qualities and positive aspects of more adaptive forms of perfectionism. Adaptive perfectionism is characterized by more flexibility in how individuals perceive making errors. Individuals with this personality style are able to view their efforts, even failing efforts, as satisfying and valuable as opposed to those with maladaptive perfectionism, which is always driven by an intense fear of failure (Hamachek, 1978). While both types of perfectionism can exhibit high organization, personal standards, conscientiousness, and desire to reach personal goals (Slade, & Owens, 1998), adaptive perfectionism has been correlated with decreased levels



of rumination as well as negative affect and negative self-critical evaluations. (Bieling, et al., 2004). Adaptive perfectionism has also been linked to possible health benefits, such as higher conscientiousness (Fry, & Debats, 2009).

Research to date has not fully addressed the practical distinction between maladaptive and adaptive perfectionism in how they relate to other emotional disturbances or how treatment can effectively shift these highly negative maladaptive behaviours into more adaptive and supportive ones. Although perfectionism is associated with increased successful life outcomes, it does not also increase satisfaction (Mor, Day, Flett, & Hewitt, 1995). Greenspon (2008) argues that individuals with perfectionism who are circumstantially able to dampen their concern for doing well are more capable of succeeding. These researchers posit that talent, energy and commitment are the determinants of success and these traits are separate from perfectionism. Perfectionism is, from their perspective, a deterrent to success, that individuals can overcome, and not a factor causing their success.

Experimental research has found that high anxiety symptoms associated with perfectionism can impair performance, so in one sense, the positive potential outcomes of perfectionism should not be confused with adaptive perfectionism (Greenspon, 2008). It is still a debate within the literature if adaptive perfectionism may reflect more conscientiousness and achievement-oriented goals instead of trait perfectionism. Greenspon (2008) deduced that real perfectionism behaviourally can be distinguished, as an individual will be acting out of seemingly endless amounts of energy with the goal to improve themselves. This stems from for the desire and motivation to be perfect as well as avoid small imperfections, which includes the perception of near perfection as not satisfactory.

Qualitative research reviewed by Greenspon (2008) depicts the core fear of imperfection as stemming from individuals struggling to accept themselves, and the fear of being unaccepted by their peers, which revolves around social relations and their self-concept. Greenspon (2008) theorized that this becomes ironically disastrous within close relationships because of the necessary vulnerability that comes with intimacy. Those closest to an individual can see their flaws and imperfections and this can initially be the hardest obstacle to receiving acceptance from close others. To be vulnerable and fully seen by others is hard for anyone, but dangerous and almost impossible for perfectionists. The depression that may come with the inhibition of authenticity creates co-morbid emotional and mental disturbances. This lack of authenticity within relationships can often exacerbate psychological distress and create circular dilemmas which make treatment challenging. Within treatment, in conjunction with cognitive and emotional components, it is then essential to address significant relationships and uncover contexts in which individuals may feel safely vulnerable and accepted by others. Perfectionism research by Blatt, Quinlan, Pilkonis, and Shea (1995) echoes this concept as they found that the need for approval and self-critical perfectionism had a consistent negative impact on depression measures for 239 participants that were randomly assigned to four psychotherapy conditions (cognitive-behavioural therapy, interpersonal therapy, imipramine, and placebo). These research results demonstrate that both reactions following success or failure, such as self-criticism and setting higher standards are critical factors in an individual's emotional and psychological outcomes.

### **Perfection and Psychological Disorders**

Egan, Piek, Dyck, Rees, and Hagger (2013) assessed the maintenance of various psychological disorders through perfectionism, such as eating disorders, anxiety, and depression.

Bardone-Cone, et al. (2007) conducted a systematic review of research papers published between 1990 and 2005, which found higher perfectionism levels in individuals with the eating disorder anorexia nervosa compared to healthy controls. While less consistent, this meta-analysis also found that individuals with the eating disorder bulimia nervosa had higher perfectionism than healthy controls, however, they did not significantly differ from an overweight control group (Bardone-Cone, et al., 2007). Cognitive behavioural models emphasize dichotomous thinking in which continual and incremental increases in personal standards following both success and failure act as a large contributing factor in the maintenance of clinical perfectionism. Egan, Piek, Dyck, Rees, and Hagger (2013) examined the qualitative response regarding motivation to change personal standards and thoughts about failure of two contrasting groups with either high (clinically diagnosed group) or low (athletes' group) perfectionism. Participants were only included if they had negative perfectionism which included having a concern over not meeting personal standards as well as the inclusion criteria of a DSM-IV anxiety and/or depression disorder diagnosis. They found that the high perfectionism group was aware of the negative consequences of perfectionism; however, they self-reported many benefits and concluded that they would not seek to change their perfectionism. Additionally, the high perfectionism group sought to set their standards higher following failure, which is in contrast to the low perfectionism group who reported wanting to keep their standards the same or set them lower. This research emphasizes the need to increase motivation for change within perfectionism treatment, as the underlying beliefs and perceptions may cause individuals with high perfectionism to focus on the perceived benefits of having very high standards.

## **Perfectionism Treatment**

Research surrounding treatments for perfectionism can help illuminate some of the nuanced factors that contribute to the maintenance and development of perfectionism. These factors may help to understand why mindset can contribute to the development of psychological disorders in those with perfectionism. Shafran and Mansell (2001) examined the general effectiveness of common treatments of perfectionism. The Frost Multidimensional Perfectionism Scale (FMPS) (Frost, Marten, Lahart, & Rosenblate, 1990) has been used to clinically assess perfectionism which differentiates self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism (Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991). Within treatment, Shafran and Mansell (2001) demonstrate that the higher the perfectionism, the lower the treatment gain and the less satisfied the patient is with treatment. Common methods of treatment include cognitive behavioural treatment focused on self-criticism, difficulty in dealing with feedback, procrastination, and excessively high personal standards. Shafran and Mansell (2001) posited that perfectionism can create a sense of failure near the end of treatment due to confrontation with therapy termination, which exacerbates perfectionistic tendencies and makes integration of alternative adaptive reactions more challenging. Shafran and Mansell (2001) also outline several less-formal treatments which include the use of self-help books which look at overcoming perfectionism by assessing triggers of perfectionistic attitudes, measuring the severity of the problems, examining helpful versus unhelpful standards, flexible versus rigid perfectionistic beliefs, and impairment caused by perfectionism.

Throughout most treatment options, there are commonly targeted aspects, such as the inclusion of a plan for change, a cost benefit analysis of loosening standards, identifying goals, setting priorities, and choosing different strategies. Example of strategies listed by Shafran and

Mansell (2001) include changing thoughts using thought records and diaries, examining concrete evidence for thoughts, educating the individual about standards, taking the perspective of an external outside person, compromising, or negotiating with oneself, looking at the big picture instead of the small details, generating coping strategies, or tolerating uncertainty.

These strategies are based on cognitive therapy for anxiety and affective disorders but translate successfully into the domain of perfectionism. Another set of suggested strategies include changing behaviour using graded exposure (ex: leaving the house slightly messy), response prevention (ex: forcing oneself to stop rechecking work), communication training, prioritizing, or overcoming procrastination (Shafran, & Mansell, 2001). While this research demonstrates the details involved in treatment, as well as depicts the experience that perfectionism creates, even within treatment, it does not address underlying beliefs and their influence in treatment approaches. Hamesch, Cropley, and Lang (2014) found that for recovery of any stressor, rumination is considered to be an essential mediating variable between the stress and the psychological health outcome. Rumination is defined as the continual processing of demands from the environment through repetitive thoughts. McEwen (1998) looked at this accumulated stress from an allostatic load model which emphasizes that the exposure to prolonged stress, such as rumination, can result in an overwhelm for the body where it can no longer manage or continuously compensate for the stressful system adaptations, which subsequently lead to long term illness and disease. Within the general model previously outlined with perfectionism, the impact of rumination fits nicely, as the ability to switch off from stressful mental work is necessary to guarantee no additional effort is wasted in tasks after the stressor or work is completed. This theoretical logic follows the effort recovery model of Meijman and Mulder (1998). The ideal psychological detachment from work would facilitate personal

recovery, however, both affective (emotional) and problem-solving (mental) rumination have been explored as important factors that delay an individual's ability to relax after the stress, as well as over long periods of time can lead to negative physical and psychological distress.

Differentiating between affective and cognitive rumination, affective rumination is defined as the intrusive and reoccurring thoughts that lead to negative emotions, whereas cognitive rumination is defined as unemotional and prolonged pondering about needed solutions to problems. It is shown that because cognitive rumination does not include continual arousal from negative emotions, it has less of a long-term impact on health. This research on stress and rumination can be theoretically linked to underlying patterns and distinctions within perfectionism. Perfectionism tendencies begin to tie into emotional states, such as anxiety, sadness, and anger, it can more negatively impact the body and mind in maladaptive ways outside of simply seeking to improve or solve problems. These distinctions between affective and cognitive ruminations may play a role in the psychological distress experienced by individuals with perfectionism.

### **Perfectionism and Social Media Use**

While self-oriented perfectionism consists of a focus directed towards one's own performance, and other-oriented a focus on others, socially prescribed perfectionism is based on expectations rooted in the social environment, such as various forms of media like social media, magazines, television, and their general portrayals of success. As perfectionism has been steadily increasing (Curran, & Hill, 2019), a correlational factor in the current societal surge of socially prescribed perfectionism is believed to come from excessive social media use.

Fioravanti, Flett, Hewitt, Rugai, and Casale (2020) assessed the link between maladaptive cognitions and problematic social media use. Specifically, those with perfectionism may feel inner dissonance and the need to live up to high standards yet feel incapable of meeting these expectations. Another factor includes social hopelessness, which is the expectation about negative outcomes socially, and the lack of fulfilling relationships, which within this research were significantly linked with social media interactions online. The results also found that pessimistic expectations about social interactions and self perceptions of not meeting expectations increased the likelihood of overutilizing social networking sites within a sample of 400 university students.

Fioravanti, Flett, Hewitt, Rugai, and Casale (2020) also had these students complete the perfectionism discrepancy, social hopelessness, and problematic social media use scale. Using structural equation modelling, they found that social hopelessness, and perfectionism discrepancy predicted preference for online social interaction. Kuss and Griffiths (2011) found that excessive use of social networking sites led to symptoms similar to other forms of addiction, such as mood alterations, tolerance, withdrawal, and relapse. Wong, et al. (2020) found a significant link between excessive social media use and psychological distress on all subscales of depression, anxiety, and stress.

### **Perfectionism and Developmental History**

Given all the past research done on perfectionism, Greenspon (2008) emphasizes that with perfectionism the key is understanding how error is meaningfully interpreted through the eyes of the individual. This meaning stems from the developmental history and experience of the individual. Even though treatment focuses on more behavioural and cognitive components, it does not address the developmental thought patterns and sets of beliefs that originate in a child

who later develops perfectionism. It also leaves out the resistance to change that is a commonly assessed personality feature. Shafran and Mansell (2001) outline four early experiences that can contribute developmentally to perfectionistic thinking. The main care givers and social connections within a youth's developmental years can create lasting impacts in their mental outlook and reactions towards success and failure. These early contributors to perfectionism include overly critical or demanding parents, parental expectations of excessively high perfectionism, indirect criticism, absent, inconsistent, or conditional parental approval, and perfectionistic parents acting as models for attitudes and behaviours.

Frost, Lahart, and Rosenblate (1991) found significant correlations among mothers and daughters with perfectionism, however not between fathers and daughters. Related to the early parent contributors, while these gender specific relationships require further research, they add a complex layer to the developmental model of environmental contributors of perfectionism. Slade, and Owens (1998) also posit that these role models and parental figures may instill perfectionistic tendencies through initial rewarding, which over time may shift into excessive, negative, and maladaptive self-criticism. This is thought to be because of the continual increase in standard setting and higher goals, which if not achieved can lead to a downward spiral (Slade, & Owens, 1998). These negative effects, may be perceived as constructive for the individual, however, indirectly dampen their psychological well-being as well as physical health (Slade, & Owens, 1998). While there is a complex mix of factors that influence how success or failure are interpreted by individuals, this research demonstrates that developmental models, including parental reactions and attitudes can heavily shape implicit beliefs and expectations.



## Mindset

This study will review the promising field of mindset as part of a developmental framework linking perfectionism and potential psychological distress symptoms. Dweck (1999) began this area of research by proposing that individuals may hold self-theories and that these implicit theories may influence student's perspective on intelligence and how they may respond to learning challenges, which would then alter their motivation and achievement. In subsequent research, Dweck (2006) expanded this notion of self-theories as mindsets to cover a broader range of domains outside of intelligence or intellectual ability.

Mindsets can be generally defined as an individual's mental outlook or state of mind that influences their attitudes and behaviours (Fang, Kang, & Liu, 2004). This review will examine the history and conception of mindsets, the broad range of topics and beliefs it has covered, how it has been used with treatment, and finally its relation to relevant constructs like psychological distress, social media use, and perfectionism.

Mindsets may influence the impact of failure and Dweck (2016, 2015) studied the impact of mindset in youth trying to learn complex new material. Those children that were more flexible in their ability to handle failure, and those that viewed the acquisition of new material as a process to achieve over time, were much more capable of grasping the material, and more importantly, had less negative affect while struggling to learn it. An individual's mindset and how they react to failure has been shown to influence motivation in relation to the acquisition of new skills or partaking in a new challenge (Rattan, Savani, Chugh, & Dweck, 2015). Within previous research, two opposing mindsets have been defined: a growth mindset and a fixed mindset. A growth mindset is the belief that individual characteristics, like intelligence or personality, can be developed and changed over time. A fixed mindset is the belief that these

traits are fixed and unchangeable. An individual with a growth mindset is more likely to explain their failure due to a lack of effort, as well as approach tasks with the goal of gaining mastery over time. Alternatively, individuals with a fixed mindset attribute personal failure to a lack of ability as well as seeing their abilities as set and immutable (Schroder, Callahan, Gornik, & Moser, 2019).

Research has been interested in uncovering the link between intelligence mindset and learning. Bejjan, DePasque, and Tricomi (2019) addressed how mindset related to intelligence shaped learning and memory. This intelligence mindset is defined as an individual's beliefs about whether their intelligence is stuck or capable of being changed. While general intelligence is thought to be quite rigid and stable, research from Stankov (1986) demonstrates that even though the effect is more significant across fluid versus crystalized intelligence, small improvements in intellectual performance can occur with continual problem-solving exercises.

Within the experiment conducted by Bejjan, DePasque, and Tricomi (2019), they measured the neural responses of participants after answering a question incorrectly and after receiving negative feedback in which their competence and capabilities were threatened. They found that those with fixed mindsets of intelligence interpreted this negative feedback as punishing and subsequently performed worse compared to those with a growth mindset who were more flexible and capable of interpreting this negative feedback as an opportunity to learn. This research demonstrates the strong relationship between mindset and performance and how reactions to failure shift depending on their mindset when participants received this negative feedback and competence threat. Hayden (2019) addressed the relationship between an individual's intelligence mindset specifically correlated to their parent's beliefs and attributions about intelligence factoring into success or failure. The results found that for the majority of

students sampled from grades six to twelve, there was a significant association between the students' perceptions of their parents' intelligence mindset and the adolescent's intelligence mindset. This effect diminished in size across the age and grade of the students, however, it is clear that one contributing factor in an individual's mindset may be their parent's mindset.

### **Domains of Mindset**

While the majority of previous research has been done in the context of academics and intelligence, there is a growing body of research that addresses mindsets across other fields of emotion, personality, as well as talent. For example, in the context of a corporation and their organizational mindset around talent, Canning, et al. (2020) found that core beliefs of an organization relate directly to their employees' level of trust and commitment.

In one of their studies, they manipulated the organizations mindset to be more fixed related to talent and found that employees reported more negative cultural norms, less integrity, and innovation, as well as less organizational trust and commitment. While the application of mindsets has just recently begun to expand into diverse domains, these results suggest that even in a broad large-scale contexts such as a corporation, the mindset held can have large tangible impacts.

Although mindsets of intelligence and personality have been examined previously, new research is emerging related to anxiety and the malleability of this self-belief. Within the domain of anxiety, previous research supports the notion that positive mindsets can increase resiliency in individuals with mental health challenges. Specifically, participants that have a growth mindset about their anxiety experience fewer symptoms of stress, depression, and substance use compared to those with more fixed mindsets (Schroder, Yalch, Dawood, et al., 2017). Schroder,

Callahan, Gornik, and Moser (2019) conducted a longitudinal study in which they examined individuals' mindsets related to their anxiety. Those with fixed mindsets about their anxiety, believing that it is unchangeable, had greater psychological distress in the future, even when controlling for the sex, socioeconomic status, baseline depression symptoms, previous week's distress, and presence of psychiatric diagnosis.

### **Treatment with Mindset**

Due to the promising research related to the positive impact of growth mindsets, studies have assessed their relevance and applicability within treatment. Schroder, Kneeland, Silverman, Beard, and Björgvinsson (2019) explored the applicability of mindsets during psychiatric treatment. They examined the mindset of patients during an intensive psychiatric partial hospitalization program and found that not only was growth mindset negatively associated with psychological distress, but also that patient's growth mindset about their anxiety predicted less anxiety at discharge even when controlling their treatment expectations and psychiatric symptoms. This was only for their mindset related to anxiety, and not about emotion.

Additionally, at discharge, patients had greater growth mindset about their anxiety, which could indicate that the treatment helped create some malleability in their beliefs. King (2020) found that within the context of intelligence mindset, there is social contagion and spreading of these implicit beliefs. This study found that when an intervention is appropriately administered, that seven months later, those students that are around the student who received the intervention also had changes to their mindset. This implies that mindsets are contagious, and that a broader social network of growth mindsets may stem from one individual shifting their mindset. While further research needs to address this potential spread socially of beliefs within other domains,

such as emotion, personality, or anxiety, it suggests that treatment gains may also extend to positively impact the communities of those individuals who received treatment.

Depending on the subject of the belief, as well as the context and methodology implemented, treatment outcomes surrounding mindset may vary. While many research studies have found successful outcomes through these interventions, others have found less significant results. Mindset interventions and research has become more popular in recent years, and several domains of research have addressed how it is applied within contexts such as schools. McCabe, Kane-Gerard, and Friedman-Wheeler (2020) looked at undergraduates with growth mindset interventions. They found no impact on self-reports and outcomes of higher retention and grade point average, respectively. They specifically addressed the idea of instilling growth mindsets related to intelligence, instead of it being viewed as fixed and unchangeable. This research questions the applicability of growth mindset interventions for academic settings based specifically on the student's mindsets related to intelligence. These researchers used a campus wide intervention at a small liberal arts college in which 229 first year undergraduates were randomly assigned to a mindset intervention or control course during their semester. The intervention conducted was an 11-minute TED talk on either mindset or sleep (for the control group), which in the mindset group were followed up with an information session about the characteristics of growth versus fixed mindsets, as well as five reflective questions on the topic. While their results were not significant, this constructively adds to the literature in assessing the general applicability of mindset interventions, as well instances in which critical analysis of research studies is relevant.

Criticisms of this research could include the minimally successful influence measured by their manipulation check. This small increase in self-reported growth mindset may indicate the

need for larger or more impactful interventions. Given the measures included and scope of this research, there still is the question of academic settings being influenced by growth mindsets in other ways. Other measures could have been included to assess drop out rates and how well the students handled failure. It is possible that although those treated with growth mindsets, did not alter their retention, or GPA, it may still alter their ability to handle challenge and failure which relates more directly to emotional experiences during their academic course.

Extending the populations studied to those directly dealing with mental and emotional challenges is essential to gain a full scope of mindsets potential treatment efficacy. Hayden (2019) found that in their preliminary analysis of 145 sixth to twelfth grade students, there was no significant predictive power of intelligence mindset on academic outcomes, including their parent's beliefs about mindset, whether they endorsed beliefs as contributing to success or failure; however, after controlling for demographic factors, they found that perceptions of incongruence between home and school, and academic efficacy were key significant factors in academic achievement.

While the current research has mixed results about the application of mindsets, especially in the broad context of intellectual ability and academic achievement, there may be a complex relationship between these variables. Patrick and Joshi (2019) explored how teachers have understood, utilized, and in some cases misinterpreted the concept of mindsets. While teachers generally support growth mindset initiatives, this research found many oversimplifications used, and several incorrect associations between fixed mindsets and the characteristics of low-performing, low-income, or immigrant students. While interventions related to mindset may be effective for supportive positive change, these applications must be addressed with strong research and technical understanding (Patrick, & Joshi, 2019). Criticisms of previous research, as

well as discrepancies across the outcomes suggest that further research needs to be conducted to identify the appropriate interventions that have sufficient impact, as well as the minimally accepted technical understanding required to appropriately implement treatment.

### **Mindset and Social Media Use**

While mindset has been related to academic outcomes, and subjective experience, other research has sought to find a link between mindset and behaviours, such as social media engagement. Song, Lee, and Kim (2019) examined differing motives for social media use (Instagram) related to mindsets. They found that those with growth mindsets were more likely to have a large variety of motivations for social media use, such as identity expression, social interaction, information seeking, relationship management compared to less diverse motives for those with fixed mindsets. This research did not examine how much social media use the participants engaged in, and simply measured their motives for use. This creates some uncertainty about how maladaptive individual use may be across mindset, and if it reaches the threshold of disordered social media use.

Interestingly, they found that those with growth mindsets were more likely to engage with Instagram activities, such as attempting to build a new relationship or learning some new skill, compared to those with fixed mindsets. This may signal that mindset influences the way in which social media is used, and growth mindset may be a contributing factor in engaging with these platforms in more adaptive ways. While further research needs to clarify the behaviours associated with differing mindsets, other studies have connected differing mindsets with perfectionistic tendencies.

## **Mindset and Perfectionism**

Some studies have made a connection between perfectionism and mindset. Chan (2012) used the Almost Perfect Scale-Revised to classify Chinese gifted students into non-perfectionists, unhealthy perfectionists, and healthy perfectionists. They compared these groups in terms of mindset and well-being and suggested supportive interventions. Healthy perfectionists were found to be the happiest and the most satisfied with life generally, whereas unhealthy perfectionists were found to score higher on fixed mindset. This research challenged the stereotyped pathological perspective of perfectionism arriving at a more nuanced understanding of factors contributing to adaptive forms of perfectionism.

Chan (2012) theorized that perfectionists that adopt a growth mindset might be less threatened by inconsistencies between their expectations and performance. Interventions may allow unhealthy perfectionists to maintain their high expectations, but strategically change their mindsets to lower the subjective distress of the discrepancy between standards and objective outcomes. While theories and research of mindset tend to polarize the two extremes of fixed and growth mindsets, Chan (2012) proposes that they are not necessarily mutually exclusive. Within their research, they found only a moderate significantly negative correlation between growth and fixed mindsets.

They also note that there is constantly a complex interplay of differing beliefs that an individual may hold. It may be the case that an individual with high perfectionism can hold a general growth mindset, however, have domain specific fixed mindsets such as fixed beliefs about intelligence or emotion. These two points demonstrate the need for further research to clarify the causal link between mindset and perfectionism, especially when distinguishing domain specificity.



Another important research study addressing the link between perfectionism and mindset was done by Kveton-Bohnert (2017) who examined the huge demands mentally, emotionally, and physically placed upon classical ballet dancers. Culturally, through intense training, and immersive isolation at young ages, maladaptive perfectionism can begin to develop along with behaviours associated with it. This research sought to incorporate strategies into training, such as resilience, mindfulness, and self-compassion, as well as the need for growth mindsets to ensure needless suffering is mitigated and well-being is optimized.

Finally, research within a population of physicians by Slavin (2019) sought to uncover factors to mitigate burnout. They found that while doctors commonly experience maladaptive perfectionism, reconnecting them to the meaning and satisfaction of their work was crucial for maintaining their well-being, and that actively implementing a growth mindset and diminishing fixed mindsets were essential in preventing burnout. All three of these research studies demonstrate preliminary trends suggesting that perfectionism and mindset are correlated, and that perfectionism and psychological distress symptoms may be mediated by mindset.

### **Research Rationale**

While the real-world effects of adaptive or maladaptive perfectionism have not been conclusively investigated, from the previous literature review, it seems promising to suggest that an individual's mindset may be one distinguishing factor that can influence these traits. Greenspon (2008) posited that anxiety within perfectionism can heavily impair performance, and while maladaptive perfectionism is associated with higher subjective distress symptoms (Williams, & Cropley, 2014), it is also the case that perfectionism is associated with positive life outcomes (Mor, Day, Flett, & Hewitt, 1995). Research is continually attempting to uncover if

perfectionism, under the correct conditions, may increase life outcomes without the cost of high distress or negative emotional outcomes.

There is currently a gap within the literature in terms of listing and distinguishing those factors that influence perfectionists' tendencies in more adaptive ways. Previous research cited from Mullarkey and Schleider (2020) found that anxiety and emotion mindsets did not directly relate to high anxiety or negative emotions such as depression on their own, aside from the underlying factor of hopelessness. These researchers theorized that another factor must be present, such as maladaptive cognitions to trigger the experience of higher anxiety and emotion. This additional factor may be perfectionistic tendencies and thought patterns, which when presented with a fixed mindset, could lead to anxiety and negative emotions. This could subsequently reach a threshold to form the maladaptive perfectionism that is associated with decreases in mental health, job performance and relationships (Rice, Richardson, & Clark, 2012), along with reduced engagement in preventative health behaviours, life satisfaction and well-being (Williams, & Cropley, 2014).

From the previous literature review, it logically follows that there should be a relationship between perfectionism and psychological distress directly, and this is what research has shown (Egan, Piek, Dyck, Rees, & Hagger, 2013). It is also expected that perfectionism may be related to a more fixed mindset, which could subsequently relate to higher psychological distress symptoms. The current research will explore mindset as a potential mediator between perfectionism and psychological distress symptoms, such as stress, anxiety, and depression.

Past research by Fioravanti, Flett, Hewitt, Rugai, and Casale (2020) has found a connection between maladaptive cognitions and excessive social media use. Considering this

research finding, a secondary research goal of our study is to uncover if social media use may also mediate the relationship between perfectionism and psychological distress.

While past research has connected fixed mindsets, higher perfectionism, and social media use to more subjective distress, as well as perfectionism to mindset and social media use, no model has addressed the connection between all these four variables in one causal path analysis model.

## Method

### Participants

A total of 278 responses were obtained through the University of Alberta's Listserv as well as snowball sampling through social media (i.e., Facebook). Of those 278, 39 responses were incomplete and did not have at least one full measure completed. Because of this, the data from 39 participants were omitted from analysis. Of the 239 respondents who remained, 70 were male, 164 were female, and 5 indicated "other". The respondents ranged from 18 to 85 years of age ( $M = 32$ ,  $SD = 13.56$ ). Eighty-one of the respondents reported that they heard about the survey through the university Listserv and the remaining 158 reported hearing about it online through snowball sampling techniques over social media.

### Measures

**Perfectionism.** Frost's Multidimensional Perfectionism Scale (FMPS; Frost, Marten, Lahart, & Rosenblate, 1990) is a general measure of perfectionism and is composed of six subscales: Concern Over Mistakes, Doubts About Actions, Parental Expectations, Parental Criticism, Personal Standards, and Organization. A composite total score of all these six subscales was used for our analysis where low scores indicated high perfectionism and vice versa. Within the scale, respondents rate their agreement with 35 statements using a 5-point Likert from 1 (*Strongly agree*) to 5 (*Strongly disagree*). Many researchers select the subscales Concerns Over Mistakes and Doubts About Actions as the main variables used within analysis, as they have been strongly associated with psychological difficulties (Cox, et al. 2002). Hewitt and Flett (1991) found item-to-subscale correlation ranges for self-oriented items (.51 - .73), other-oriented items (.43 - .64), and socially prescribed items (.45 - .71). Internal consistency

was also found within these items of self-oriented ( $\alpha = .86$ ), other-oriented ( $\alpha = .82$ ) and socially prescribed ( $\alpha = .87$ ) and intercorrelations across MPS subscales demonstrated adequate overlap ranging from .25 to .40 (Hewitt & Flett, 1991). Frost et al. (1990) demonstrated high internal consistency, ranging from .77 to .92, as well as high construct validity in which the FMPS was highly correlated with the Burns Perfectionism Scale as well as correlated with subscales of the Irrational Beliefs Tests and the Eating Disorders Inventory which address personal standard setting, perfectionism, and parental expectations.

**Depression, Anxiety and Stress.** The Depression, Anxiety and Stress Scale (DASS 21; Lovibond, & Lovibond, 1995) is a measure of symptoms across the three domains of depression, anxiety, and stress. Respondents rate how many symptoms applied to them across 21 statements using a range from 1 (*Applied to me very much, or most of the time*), 2 (*Applied to me a considerable degree, or a good part of the time*), 3 (*Applied to me to some degree, or some of the time*), or 4 (*Did not apply to me at all*). Scoring lower on this scale represents higher depressive symptoms and vice versa. Sufficient internal consistency from a sample of 1,387 students was demonstrated ( $\alpha = .761 - .906$ ) with items loading on general distress, depression, and anxiety (Le et al., 2017). Le et al. (2017) also assessed convergent validity comparing the DASS 21 to the mental health domains of the Duke Health Profile and demonstrated moderate correlation coefficients (0.47 - 0.66). Henry and Crawford (2005) assessed the construct validity of the DASS 21 from a sample of 1,794 adults and showed excellent model fit to assess dimensions of depression, anxiety, and stress as well as general negative affectivity compared to models that tested only negative affect. While the scale can be split into separate factors for depression, anxiety, and stress, Zanon et al. (2020) found that it is best used as a compiled general score for

psychological distress, instead of separate domains. Zanon et al. (2020) also analyzed and found strong reliability across the eight countries in which they sampled 2,580 participants.

**Implicit Mindset.** The Implicit Mindset Scale (IMS; Schroder, et al.,2015) is a 11-item measure of attitudes and beliefs about change. This measure assesses the growth versus fixed mindset of an individual by asking their level of agreement with statements related to how much they believe a quality of themselves can be changed. These qualities span across four subtests and domains: Personality, Intelligence, Emotion, and Anxiety. Respondents use a six-point Likert scale from 1 (*Strongly Agree*) to 6 (*Strongly Disagree*). Those that scored lower on any subscale represent fixed mindsets in which they do not believe a trait can change. Items one and two from the Emotion subtest were reverse scored. While all the scales address growth versus fixed mindset because they address different domains, we kept them separate as individual domains for the analysis instead of combining them into one general measure of mindset. Dweck, Chiu, and Hong (1995) have found that specific measures of individual domains of mindset are more precise in assessing implicit theories compared to general measures.

While we are interested in how mindset mediates other variables, self reports of mindset may be confounded by the socially desired perspective of growth mindsets. Hong et al. (1999) found that individuals with fixed mindsets still endorse items about a growth mindset. Of the eleven mindset items, only two of them (reverse scored emotion items) were positively framed as a growth mindset. Dweck, Chiu, and Hong (1995) found that disagreement with fixed mindset-oriented items is linked with a growth mindset. While much of the previous research has examined implicit beliefs related to motivation, educational outcomes, and responses to challenges (Yeager, & Dweck, 2012), fewer studies have examined these beliefs in relation to mental health, or with emotion and anxiety (De Castella, et al., 2014). While this measure of

mindset is newer than the other measures used in this research, Schroder, et al., (2015) demonstrate high alphas across all subscales ( $\alpha = .82 - .97$ ), as well as demonstrated internal consistency through significant correlations between the various subscales. Furthermore, there were significant factor loadings onto four distinct domains with each item loading on their appropriate factor. Finally, Schroder, et al., (2015) found evidence for construct validity through significant correlations between the IMS measure and several other complementary scales such as the Change Questionnaire (Miller, & Johnson, 2008), Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990), and the Emotion Regulation Questionnaire (Gross & John, 2003).

**Social Media Use.** The Social Media Disorder Scale (SMDS; Van Den Eijnden, Lemmens, & Valkenburg, 2016) is a 27-item scale designed to measure dysfunctional use of social media. Respondents were asked to rate if a situation applied to them or not, 1 (*Yes*) and 2 (*No*), for a number of disordered uses of social media, such as addictive tendencies, avoidance, secretive use, and tolerance. A higher SMDS score is associated with less disordered use of social media. Van Den Eijnden, Lemmens, and Valkenburg (2016) assessed the scales internal consistency, convergent and criterion validity, as well as test-retest reliability. From a sample of 2,198 Dutch adolescents, they demonstrated high internal consistency ( $\alpha = .90 - .92$ ), adequate convergent validity, as it was correlated with compulsive internet use ( $r > 0.50$ ) and self-declared social media addiction ( $r > 0.48$ ), adequate criterion validity with medium to large correlations compared to related constructs such as depression, attention deficits, frequency of daily social media use, as well as impulsivity, and finally moderate test-retest reliability.

## Procedure

Survey Monkey was used as the research platform to create the online survey. Each participant was invited to complete a study package by clicking an online link which directed them to the Survey Monkey survey. Participants that were gathered from University of Alberta's Listserv were given this invitation and link directly in their email. To recruit participants from Facebook, the invitation and link was posted within research recruitment groups and pages, in which participants voluntarily clicked the survey. The structure of the research study included an initial consent form which outlined the general background of the study, the purpose, and the study procedures, including the estimated time of 30 minutes to complete. The anticipated benefits were outlined, as well as the minimal risks involved with participating. A student counselling service line as well as mental health helpline were included in case participants felt distressed during the study. Individuals 18 years of age and older were recruited for the study. Voluntary participation and the anonymity/confidentiality were outlined in the consent form. No personally identifying information was requested or obtained in this survey, to ensure that participants felt their responses were confidential and anonymous. At the bottom of the consent form there was a consent statement that outlined that consent was implied by clicking next and continuing with the survey. After the consent form, there was a demographics questionnaire asking the participant's age, gender, ethnicity, occupation/student status, education level, as well as how they found out about the study. Next, a participant completed the four scales (Implicit Mindset Scale, DASS 21, FMPS, and Social Media Disorder Scale) in a randomized order. There was then a debriefing form that included a more detailed outline of the study hypothesis as well as another listing of the helpline contact and a thank you for participating in the research. Ethics were approved May 29<sup>th</sup>, 2020 with the REB ID: Pro00099231.



## Results

Summary statistics for the measures are listed in Table 1. Cronbach's alpha for Anxiety Mindset was  $\alpha = .943$ , Intelligence Mindset  $\alpha = .936$ , Emotion Mindset  $\alpha = .759$ , Personality Mindset  $\alpha = .890$ , FMPS  $\alpha = .909$ , DASS-21  $\alpha = .936$ , and SMDS  $\alpha = .881$ . Correlations between measures are presented in Table 2. A higher score on the anxiety mindset being associated with growth, for example, was correlated to lower perfectionism, lower depression, anxiety, and stress, and less dysfunctional use of social media. Lower perfectionism was correlated to lower depression and anxiety, and to less dysfunctional use of social media. And lower depression and anxiety was correlated with less dysfunctional use of social media.

While the general descriptive statistics display the means, standard deviations, skewness, and kurtosis of each of the seven measures, the values represented demonstrate the general trends found in this sample. For the mindset measures, while the mean for Anxiety Mindset, Intelligence Mindset, and Emotion Mindset are respectively  $M(239) = 15.72$ ,  $16.47$ ,  $16.81$ , the mean of Personality Mindset is lower at  $M(239) = 11.53$ . While we did not conduct an analysis on the significance of these mean scores comparatively, there appears to be a trend within this sample toward the personality mindset being slightly more fixed compared to the other domains of mindset.

**Table 1*****Summary Descriptive Statistics***

Measure	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
Anxiety Mindset	15.72	4.92	-.155	-.693
Intelligence Mindset	16.47	5.09	-.464	-.569
Emotion Mindset	16.81	3.53	-.269	.950
Personality Mindset	11.53	3.43	-.259	-.422
FMPS	97.69	18.76	-.187	-.459
DASS-21	65.18	12.44	-.643	-.205
SMDS	48.18	4.36	-.766	.016

We measured the skewness of the data, and while no skewness scores are above an absolute value of 1 (Doane, & Seward, 2011) the general distribution can indicate the trends within the sample population. All of the implicit mindset measures were found to have a negative skewness (Anxiety Mindset =  $-.155$ , Intelligence Mindset =  $-.464$ , Emotion Mindset =  $-.269$ , Personality Mindset =  $-.259$ ), which means that the general distribution of mindset scores in the population trends towards growth mindsets, with a longer tail on the lower end of scores distribution. Skewness for the other three measures were also below zero with FMPS =  $-.187$ , DASS-21 =  $-.643$ , and SMDS =  $-.766$ . This could be interpreted as the population sampled trending towards a slightly lower distribution of perfectionism, psychological distress symptoms, as well as disordered social media use, with more of the scores being on the right of the distribution, which all indicate lower values on these three constructs.

Within the second table are the correlations between the measures. Noteworthy are the statistically significant correlations between SMDS and FMPS,  $r(239) = .302$ ,  $p < .01$ , SMDS and the DASS-21.  $r(239) = .371$ ,  $p < .01$ , as well as FMSP and the DASS-21.  $r(239) = .443$ ,  $p < .01$ . Within the mindset scales, all of the domains of mindset are significantly correlated at  $p < .01$ , which would indicate that they are similarly measuring implicit beliefs and self-theories, even though they are addressing different domains and subjects of beliefs. Within the four domains of mindset, the most important findings relate to Anxiety Mindset which correlates to all other measures, including SMDS,  $r(239) = .189$ ,  $p < .01$ , FMPS,  $r(239) = .342$ ,  $p < .01$ , DASS-21,  $r(239) = .487$ ,  $p < .01$ , as well as the other mindset scales that include Intelligence Mindset,  $r(239) = .243$ ,  $p < .01$ , Emotion Mindset,  $r(239) = .384$ ,  $p < .01$ , and Personality Mindset,  $r(239) = .335$ ,  $p < .01$ . Before assessing the path models, these correlation results demonstrate that there were significant direct relationships between beliefs about anxiety and all

of the other measures in this study. This indicates that a more fixed mindset about anxiety was co-occurring with higher perfectionism, psychological distress symptoms, as well as disordered social media use. Results found that Personality Mindset was related to FMPS,  $r(239) = .147$ ,  $p < .05$ , however was not significantly correlated to SMDS, or DASS-21. Emotion Mindset was significantly related to DASS-21,  $r(239) = .151$ ,  $p < .05$ , however was not significantly linked to FMPS or SMDS. Finally, Intelligence Mindset was found to be significantly correlated to FMPS,  $r(239) = .130$ ,  $p < .05$ , however was not significantly related to DASS-21 or SMDS.

Path analysis of the covariance matrix was conducted using IBM SPSS AMOS 27 with maximum likelihood estimation. Four separate path analyses were performed for the four Mindset subscales. Each path analysis tested FMPS predicting DASS-21, SMDS, and Mindset subscales directly, SMDS predicting DASS-21 directly, Mindset subscales predicting DASS-21 directly, and FMPS predicting DASS-21 indirectly through Mindset and SMDS (Figure 1).

Model fit was assessed through a number of fit statistics: the overall chi-square, comparative fit index (CFI), normed fit index (NFI), and root mean squared error of approximation (RMSEA). A well-fitting model is one that has a statistically non-significant chi-square (although chi-square is strongly influenced by sample size), CFI greater than .95, NFI greater than .95, and RMSEA less than .05 (Hu & Bentler, 1999). Kline (2013) suggests dividing the chi-square by its associated degrees of freedom with values less than 5 suggesting excellent fit.

**Table 2*****Correlations Between Measures***

Measure	Anxiety.	Intellig.	Emotion	Person.	FMPS	DASS-21	SMDS
Anxiety Mindset	-						
Intelligence Mindset	.243**	-					
Emotion Mindset	.384**	.298**	-				
Personality Mindset	.335**	.322**	.336**	-			
FMPS	.342**	.130*	.040	.147*	-		
DASS-21	.487**	.063	.151*	.090	.443**	-	
SMDS	.189**	-.087	.034	.070	.302**	.371**	-

\*  $p < .05$ , \*\*  $p < .01$

Note. A higher mindset scores is associated with growth; a higher FMPS score is associated with lower perfectionism; a higher DASS score is associated with lower depression and anxiety; a higher SMDS score is associated with less dysfunctional social media use.

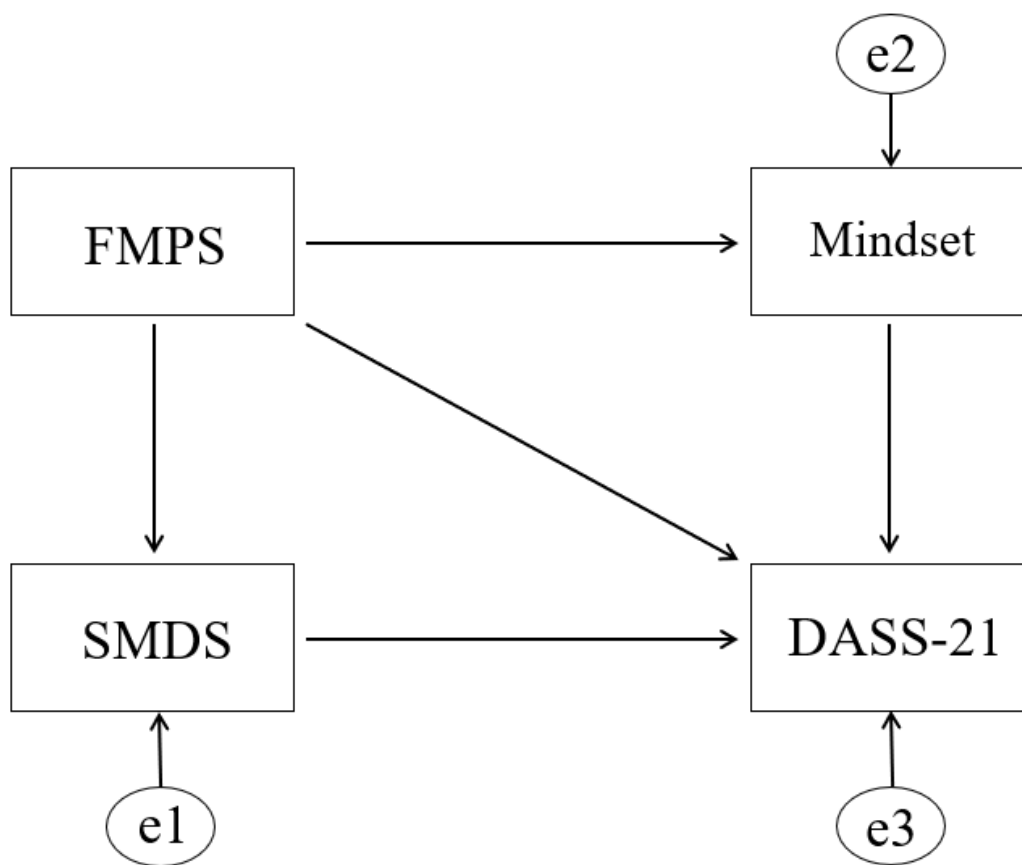


Figure 1. Mindset path model

For the path model with Personality Mindset (Figure 2), fit statistics are as follows:  $\chi^2$  (1,  $N = 239$ ) = .180,  $\chi^2 / df = .180$ , CFI = 1.00, NFI = .998, RMSEA = 0.00 (90% CI = .000-.130). Thus, model fit is acceptable. Figure 1 shows the standardized coefficients between paths. All paths were statistically significant at  $p < .001$  with the exception of FMPS to Personality Mindset ( $p < .021$ ), and Personality Mindset to DASS-21 that was not statistically significant ( $p < .753$ ).

To assess indirect effects, bias-corrected percentile method bootstrapping in AMOS found the indirect effect between FMPS and DASS-21 of  $\beta = .081$ , the product of (FMPS to Personality Mindset  $\beta = .15$  \* Personality Mindset to DASS-21  $\beta = .02$ ) + (FMPS to SMDS  $\beta = .30$  \* SMDS to DASS-21  $\beta = .26$ ), to be statistically significant ( $p < .009$ ). Constraining to zero the paths from FMPS to Personality Mindset and from Personality Mindset to DASS-21 found the indirect effect from FMPS to DASS-21 through SMDS to be statistically significant ( $\beta = .079$ ,  $p < .006$ ).

Conversely, constraining to zero the paths from FMPS to SMDS and from SMDS to DASS-21 found the indirect effect from FMPS to DASS-21 through Personality Mindset not to be statistically significant ( $\beta = .004$ ,  $p < .490$ ).

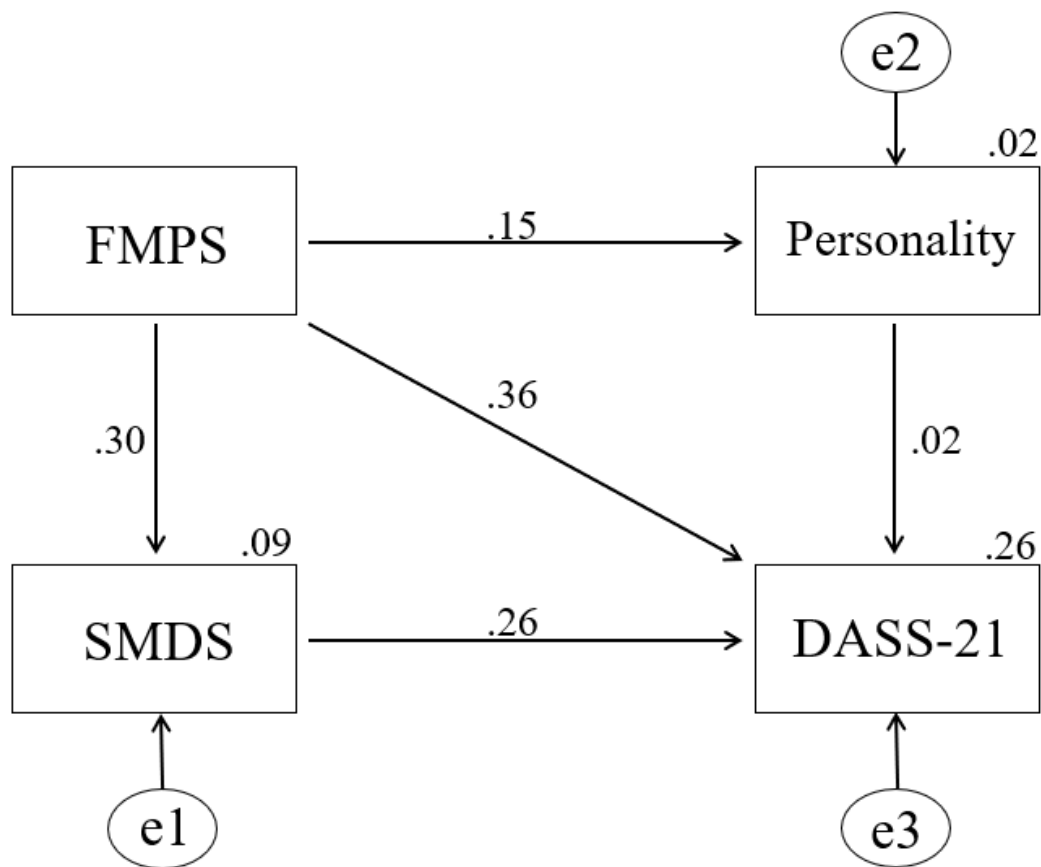


Figure 2. Personality path model



For the path model with Intelligence Mindset (Figure 3), fit statistics are as follows:  $\chi^2(1, N = 239) = 4.253$ ,  $\chi^2/df = 4.253$ , CFI = .966, NFI = .959, RMSEA = .117 (90% CI = .021-.240). Thus, model fit is acceptable. Figure 2 shows the standardized coefficients between paths. All paths were statistically significant at  $p < .001$  with the exception of FMPS to Intelligence Mindset ( $p < .043$ ) and Intelligence Mindset to DASS-21 that was not statistically significant ( $p < .486$ ). To assess indirect effects, bias-corrected percentile method bootstrapping in AMOS found the indirect effect between FMPS and DASS-21 of  $\beta = .085$ , the product of (FMPS to Intelligence Mindset  $\beta = .13$  \* Intelligence Mindset to DASS-21  $\beta = .04$ ) + (FMPS perfectionism to SMDS  $\beta = .30$  \* SMDS to DASS-21  $\beta = .27$ ), to be statistically significant ( $p < .003$ ). Constraining to zero the paths from FMPS to Intelligence Mindset and from Intelligence Mindset to DASS-21 found the indirect effect from FMPS to DASS-21 through SMDS again to be statistically significant ( $\beta = .079, p < .006$ ). Conversely, constraining to zero the paths from FMPS to SMDS and from SMDS to DASS-21 found the indirect effect from FMPS to DASS-21 through Intelligence Mindset not to be statistically significant ( $\beta = .001, p < .633$ ).

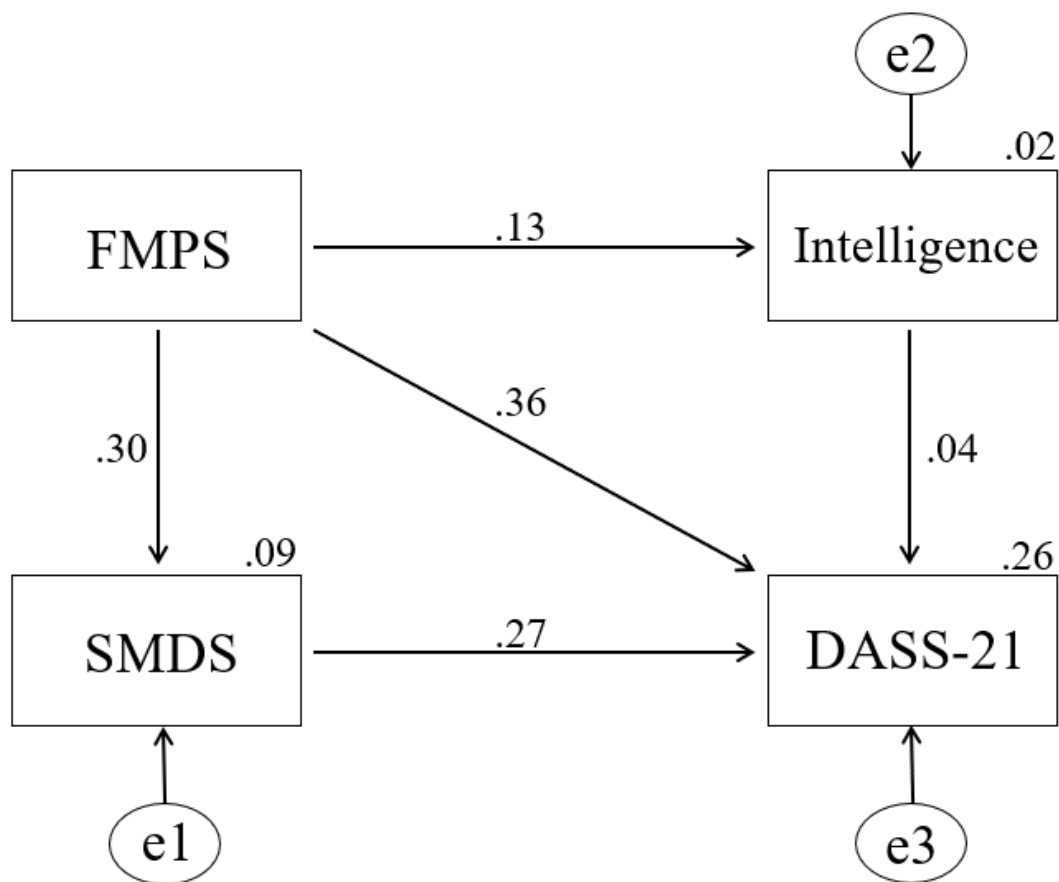


Figure 3. Intelligence path model

For the path model with Emotion Mindset (Figure 4), fit statistics are as follows:  $\chi^2 (1, N = 239) = .122$ ,  $\chi^2 / df = .122$ , CFI = 1.00, NFI = .999, RMSEA = 0.00 (90% CI = .000-.122). Thus, model fit is acceptable. Figure 3 shows the standardized coefficients between paths. All paths were statistically significant at  $p < .001$  with the exception of Emotion Mindset to DASS-21 that was statistically significant at  $p < .021$  and FMPS to Emotion Mindset that was not statistically significant ( $p < .541$ ). To assess indirect effects, bias-corrected percentile method bootstrapping in AMOS found the indirect effect between perfectionism and DASS of  $\beta = .083$ , the product of (FMPS to Emotion Mindset  $\beta = .04$  \* Emotion Mindset to DASS-21  $\beta = .13$ ) + (FMPS to SMDS  $\beta = .30$  \* SMDS to DASS-21  $\beta = .26$ ), to be statistically significant ( $p < .009$ ). Constraining to zero the paths from FMPS to Emotion Mindset and from Emotion Mindset to DASS-21 again found the indirect effect from FMPS to DASS-21 through SMDS to be statistically significant ( $\beta = .079, p < .006$ ). Conversely, constraining to zero the paths from FMPS to SMDS and from SMDS to DASS-21 found the indirect effect from FMPS to DASS-21 through Emotion Mindset not to be statistically significant ( $\beta = .005, p < .483$ ).

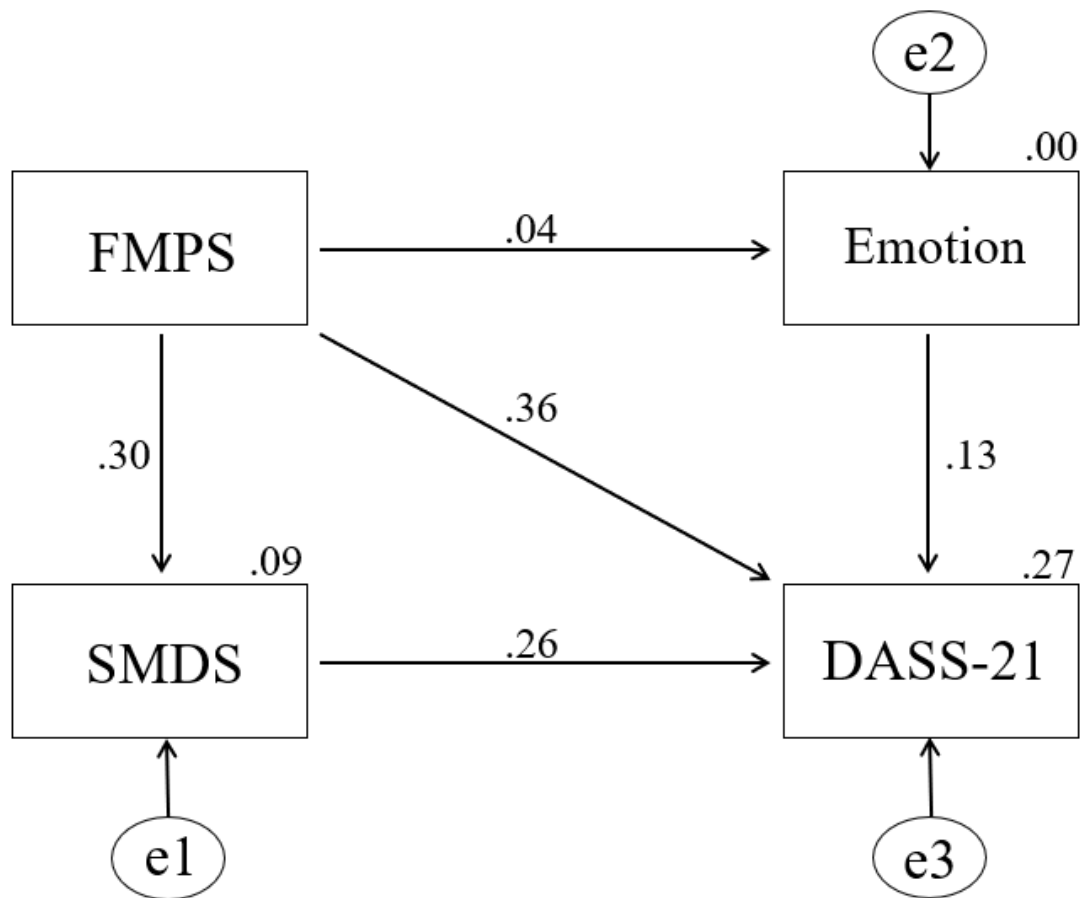


Figure 4. Emotion path model

For the path model with Anxiety Mindset (Figure 5), fit statistics are as follows:  $\chi^2 (1, N = 239) = 2.181$ ,  $\chi^2 / df = 2.181$ , CFI = .993, NFI = .987, RMSEA = .070 (90% CI = .000-.202). Thus, model fit is acceptable. Figure 4 shows the standardized coefficients between paths. All paths were statistically significant at  $p < .001$ . To assess indirect effects, bias-corrected percentile method bootstrapping in AMOS found the indirect effect between FMPS and DASS-21 of  $\beta = .193$ , the product of (FMPS to Anxiety Mindset  $\beta = .34$  \* Anxiety Mindset to DASS-21  $\beta = .36$ ) + (FMPS to SMDS  $\beta = .30$  \* SMDS to DASS-21  $\beta = .23$ ), to be statistically significant ( $p < .018$ ). Constraining to zero the paths from FMPS to Anxiety Mindset and from Anxiety Mindset to DASS-21 again found the indirect effect from FMPS to DASS-21 through SMDS to be statistically significant ( $\beta = .079, p < .006$ ). Conversely, constraining to zero the paths from FMPS to SMDS and from SMDS to DASS-21 found the indirect effect from FMPS to DASS-21 through Anxiety Mindset to be statistically significant ( $\beta = .13, p < .012$ ).

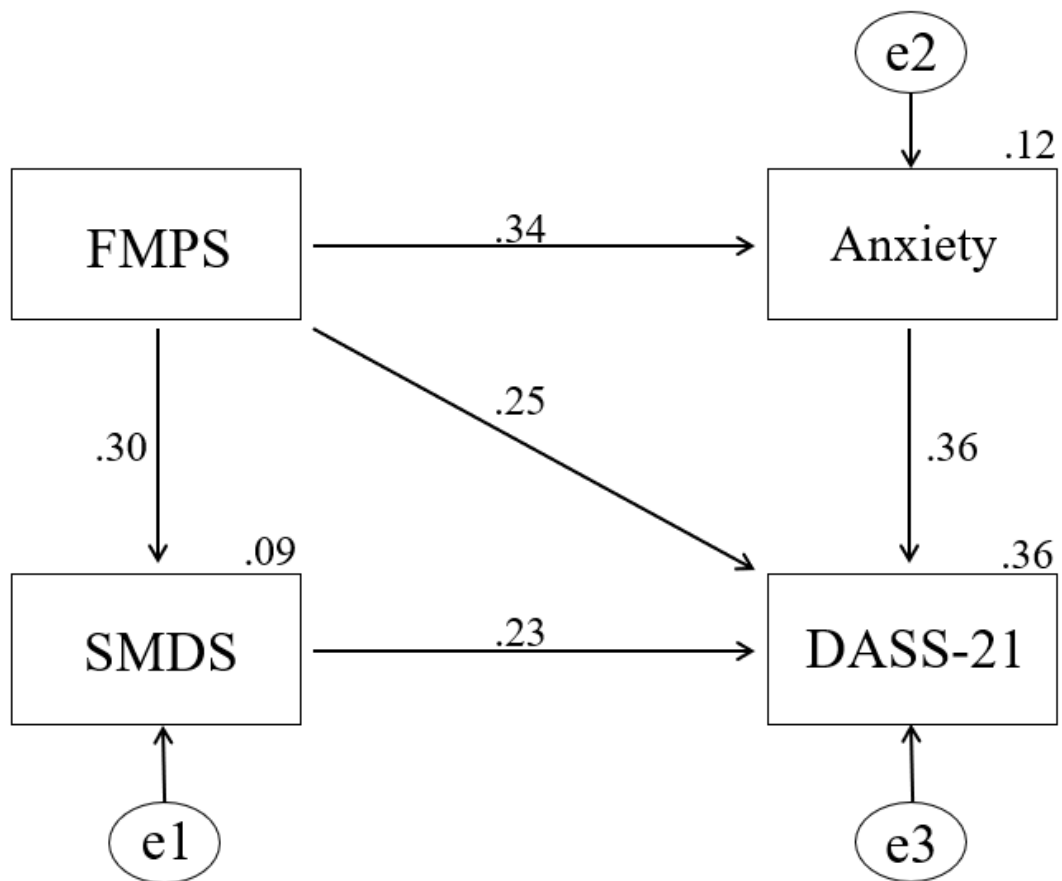


Figure 5. Anxiety path model

## Discussion

The purpose of this research study was to investigate mindset and social media use as potential mediators between perfectionism and psychological distress symptoms. In summary, the results found a direct relationship between perfectionism and psychological distress symptoms, which was mediated by both disordered social media use and anxiety mindset. The other domains of mindset, related to intelligence, personality, and emotion did not mediate the relationship between perfectionism and psychological distress symptoms. These results will be explored in greater detail in the discussion.

To extend the previous research linking mindset to psychological distress symptoms as well as perfectionism, the current research tested four path models to assess how these constructs relate to each other. Path analysis was used to explore the potential mediation effect of mindset and social media use between perfectionism and psychological distress symptoms.

Across three of the four path models excluding Anxiety Mindset, the models showed acceptable fit with statistically significant paths between all variables except for Mindset to DASS-21 (and for FMPS to Emotion Mindset). There were overall indirect effects between FMPS to DASS-21, and these overall indirect effects were a consequence of the specific indirect effects between FMPS and DASS-21 via SMDS, but not via Mindset. While our beliefs about personality, intelligence, or emotion may impact psychological distress symptoms, and may relate to perfectionism, these beliefs fail to mediate the relationship between perfectionism and the negative emotional states of depression, anxiety, and stress.

One exception to these findings was for Anxiety Mindset. Anxiety Mindset was related to DASS-21 (and also FMPS), and Anxiety Mindset also mediated an indirect effect between FMPS and DASS-21.

While the expected mediation effect from Anxiety Mindset and disordered social media use matches the results found, it was also expected to find a potential mediation effect from Emotion Mindset. Research by Mullarkey and Schleider (2020) found that there is little connection between anxiety and emotion mindsets and the internalizing symptoms that are associated with depression and anxiety, aside from the symptom of hopelessness. While the current results found a significant correlation between Anxiety Mindset and Emotion Mindset,  $r(239) = .384, p < .01$ , which differs from the results of Mullarkey and Schleider (2020), their findings may help explain the lack of mediation effect that Emotion Mindset had between FMPS and DASS-21. The current results found that emotion mindset did significantly relate to psychological distress symptoms, however, not perfectionism. It may be the case that emotion mindset alone does not contribute significantly to these psychological distress symptoms and requires another factor to trigger impactful symptoms. While Emotion Mindset does not relate to FMPS, and Anxiety Mindset does, the differing correlation to perfectionism may cause Anxiety Mindset to significantly trigger psychological distress symptoms, which does not occur in Emotion Mindset. The current results which show a significant path through perfectionism and anxiety mindset to psychological distress symptoms may be as a result of the compounding effect of maladaptive cognitions that pair perfectionism with a fixed mindset to trigger these symptoms of anxiety, stress, or depression. Given that Emotion Mindset does not significantly correlate to FMPS,  $r(239) = .040$ , the lack of maladaptive cognitions paired with a more fixed



mindset about emotion, may not trigger the similar resulting psychological distress symptoms that is present with Anxiety Mindset.

From the first and second path model of personality, and intelligence, respectively, we can see that both models have acceptable fit, however do not demonstrate significant indirect mediation paths from perfectionism through mindset to psychological distress. As all four path models assessed both a domain of mindset as well as disordered social media use, the acceptable fit from the models of personality and intelligence is strongly influenced by the mediation effect of disordered social media use. While the correlations between measures demonstrated that Personality Mindset and Intelligence Mindset relates to FMPS, ( $r(239) = .147, p < .05$ , and  $r(239) = .130, p < .05$ ) there was no significant correlation of either to DASS-21 ( $r(239) = .090$ , and  $r(239) = .063$ ). It is logically expected that neither of these domain specific beliefs significantly mediate psychological distress symptoms. Considering the subject of those beliefs, whether beliefs about the malleability of intelligence or personality are unrelated to emotions or anxieties, which encompass psychological distress.

To fit the predicted results of Anxiety Mindset within the context of previous literature, initial comparisons can be made from studies with matching variables, as well as comparable constructs, such as optimism and rumination. Bostock, Kinnison, and May (2018) investigated 130 veterinary students and had them complete a general mindset measure as well as an anxiety measure. They found that those participants with a more fixed mindset reported greater levels of anxiety than those with a growth mindset. Related to the current data, those with a fixed mindset of anxiety are logically experiencing more psychological distress symptoms, which include anxiety, among other symptoms, such as depression and stress. This outcome also matches the findings from Schroder, Callahan, Gornik, and Moser (2019), discussed in the introduction. Yu,

Chen, Liu, Yu, and Zhao (2015) found that within a sample of 448 Chinese undergraduate students, there was partial mediation of rumination and anxiety via dispositional optimism. Dispositional optimism is defined as a psychological quality and positive personality trait where an individual has positive expectations for their future. Rumination was defined as repetitive thought patterns that occur when someone is under pressure or after a negative life event (Treyner, Gonzalez, & Nolen-Hoeksema, 2003). Yu et al. (2015) demonstrated that the relationship between rumination and anxiety decreased in the presence of optimism. This means that those with higher dispositional optimism are less likely to ruminate, but also, are less likely to experience high anxiety. Hamesch, Cropley, and Lang (2014) also addressed rumination within their research of perfectionism recovery in which rumination was a key mediating variable between stress and psychological health outcomes. These constructs can be theoretically linked to the constructs used in the current research in terms of the belief and mental construction that projects expectations into the future. Optimism is the general expectation for future outcomes to be positive, and growth mindset, is the general belief that certain traits can change, which in many cases is the shift from negative traits to more positive traits, such as with improving intellectual ability, alleviating negative emotions, or reducing anxiety.

Research by Dardick, and Tuckwiller (2019) found that there is a significant direct correlation between optimism and growth mindsets, as well as a similar correlation between pessimism and fixed mindsets. They found, however, that there were no direct effects of optimism on fixed mindset, or pessimism on growth mindset. While the lack of direct effects of optimism on fixed mindset, and pessimism on growth mindsets may imply difficulties in the treatment of pessimism with growth mindsets, the correlation between optimism and growth

mindsets demonstrates that the constructs of optimism and growth mindsets are inherently related.

Empirical findings from Dunn, Gotwals, Dunn, and Lizmore (2020) looked at a group of 144 high performing football players to understand the relationship between more adaptive forms of perfectionism, worry, and optimism. They found that those with a maladaptive profile of perfectionism which included high personal expectations for performance combined with high concerns were positively correlated with high worry, and low optimism. Within the opposing group, in which participants reported more adaptive profiles of perfectionism, including high striving and expectation, with low concerns, they found a strong correlation with low worry, and high optimism. While the constructs in the current study differ from those of Yu, Chen, Liu, Yu, and Zhao (2015), the general model can be related and understood under this lens, as perfectionism, instead of rumination was mediated by growth mindset, instead of optimism, and resulted in decreases in reported anxiety, which in the current study encompass part of the psychological distress measured by the DASS-21.

Tuckwiller, and Dardick (2018) conducted research on mindset, grit, and optimism with and without depression and anxiety. They found that those with anxiety and/or depression presented significantly with fixed mindsets and pessimism, as well as lower levels of grit, optimism, as well as life satisfaction generally. While this model does not incorporate perfectionism or social media use, it demonstrates the direct relationship between pessimism and fixed mindsets, including the connection to depression and anxiety symptoms. Mindsets generally have been related to grit, which is a term used by Angela Duckworth to describe resilience in the context of challenge. Albert, Petrie, and Moore (2019) looked at motivation, mindsets, and grit in male soccer players and highlighted the difference in performance due to

factors such as mindset. They found that having growth mindsets, and task-oriented goals significantly predicted higher grit. These fundamental beliefs about the capability of change over time, and task focused achievement seem to lead to the functional success of working towards long term goals. While it has been demonstrated that an individual's reaction to success or failure are key components for outcomes, underlying beliefs can fundamentally influence this relationship.

Schroder, Kneeland, Silverman, Beard, and Björgvinsson (2019) found that while examining the mindset of patients during an intensive psychiatric partial hospitalization program, that patient's growth mindset about their anxiety predicted less anxiety at discharge even when controlling their treatment expectations and psychiatric symptoms. This was only for their mindset related to anxiety, and not about emotion. Research conducted by Bieling et al. (2004) found that adaptive perfectionism has been correlated with decreased levels of rumination as well as negative affect and negative self-critical evaluations. Previous research suggests that anxiety mindset may act as the strongest mediator in the relationship between perfectionism and psychological distress. Due to the decrease in anxiety symptoms experienced when individuals hold a growth mindset about their anxiety, it logically follows that more adaptive forms of perfectionism may emerge due to decreases in problematic rumination.

The secondary goal of this research was to examine the added dimension of social media use as a mediator between perfectionism and psychological distress symptoms. While limited research has been conducted looking at social media use as a mediator between perfectionism and psychological distress symptoms, research from Padoa, Berle, and Roberts (2018) investigated the potential mediation effect of social media frequency and social comparison between perfectionism and mental health outcomes. This research sampled 201 mothers and

assessed two parenting specific dimensions of perfectionism (self-oriented parenting and societal-prescribed parenting) through an online survey, while also measuring their frequency of social media use along with their psychological distress symptoms through the DASS-21. The results from this previous research found that for self-oriented parenting perfectionism, the process of comparison to other mothers on social media did contribute to their psychological distress symptoms, however the frequency and time spent on social media did not influence their anxiety and depression. In the case of societal-prescribed parenting perfectionism, they uniquely found that time spent on social media platforms did contribute to psychological distress symptoms, and the process of comparing themselves to other mothers contributed to increases in anxiety symptoms (Padoa, Berle, & Roberts, 2018).

To help explain the results of the present study, we can compare them to the results from Padoa, Berle, and Roberts (2018). The current research found, across all path models, a significant mediation effect of disordered social media use between perfectionism and psychological distress symptoms. This result can generally be interpreted as those with high perfectionism are more likely to engage with disordered social media use (e.g., addictive tendencies, avoidance, secretive use, and tolerance) and then are subsequently more likely to experience increased psychological distress.

Padoa, Berle, and Roberts (2018) differentiated between frequency of social media use and social comparison, which demonstrates the distinction between, respectively, the time spent on social media platforms, and the motives or reasons for engaging in social media use. Disordered social media use does not relate directly to frequency of social media use, as it measures the symptoms and maladaptive behaviours while engaging with social media. Research by Lee (2014) found a correlation between social comparison on social media and increases in

negative emotions such as anxiety and depression. While increases in social comparison and increases in negative emotions may be expected to decrease social media engagement, it can trigger an opposite response, by motivating individuals to spend more time on social media. Whether motivated by attempts to portray themselves and their lifestyles more positively (Dorethy, Fiebert, & Warren, 2014), or from fear of being perceived negatively by others (Choi, Henshaw, Baker, & Tree, 2005), higher social comparison with social media may increase use, as well as negative behaviours and habits on social media platforms. While no research has directly related social comparison scales via social media to disordered social media use scales, it logically follows from previous research that high levels of social comparison on social media can trigger disordered social media use. For this reason, theoretically, these two constructs may be related and can be compared for the purposes of understanding the current research results.

In both mediation models from Padoa, Berle, and Roberts (2018), they found that social comparison on social media platforms partially mediated the relationship between perfectionism and psychological distress symptoms. This logically fits with the current research result, as disordered social media use, could represent the result of continuous negative social comparisons on social media platforms. Research by Hellmann, E. (2016) can also corroborate these research findings. In her research, she found that perfectionistic self-representation on social media moderates the relationship between perfectionism and psychological distress symptoms. While the measures and structure of the analysis differ from the current study, the interpretation is quite similar, in that those with higher perfectionism may feel increased pressure to appear perfect on social media platforms and thus engage with social media in disordered ways which then increases their negative psychological outcomes.

## Future Directions

Although within the path analysis model we did not propose or test a relationship between disordered social media use and mindset, there was a modest correlation between SMDS and Anxiety Mindset. This correlation between disordered social media use and mindset is only present in the case of beliefs about anxiety, and not for beliefs of emotion, personality, or intelligence. Future research may be able to address this potential connection between beliefs about anxiety and disordered social media use in more detail.

As posited in previous research studies, social media use theoretically seems to act in conjunction with perfectionism as a process of comparison to others. Whether or not this correlation results in psychological distress seems to be mostly dictated by the specific domain of perfectionism as well as the behaviours and motivations while engaging with social media. While Padoa, Berle, and Roberts (2018) measured two dimensions of perfectionism separately (self-oriented and societal-prescribed), in the current research, these dimensions of perfectionism measured by the FMPS were combined into one global measure of perfectionism. Padoa, Berle, and Roberts (2018) found differing mediation effects depending on the specific dimension of perfectionism. It may be the case that only certain dimensions of perfectionism, such as societal-prescribed perfectionism, which inherently is oriented towards other perspectives of you, may trigger psychological distress symptoms with higher social media use. While Padoa, Berle, and Roberts (2018) did not assess the third dimension of perfectionism (other-oriented), it may be that those other dimensions of perfectionism that are oriented towards the self or oriented towards others, but not societal perspectives, have less of a negative mental health impact when paired with social media use. Future research can address similar path models with more

specificity on the measures of social media use, as well as differentiating the specific dimensions of perfectionism.

In summary, future research could distinguish the dimensions of perfectionism, the frequency, and motives for social media use, as well as the symptoms of psychological distress to gain a more nuanced understanding of which specific domains of these variables are most strongly influencing this model.

### **Implications for Counselling**

While optimism is a stable personality trait (Scheier, & Carver, 1985), the construct mindset is much more malleable, and could inform interventions. To utilize mindset within treatment, research must clarify within experimental interventions the contexts in which it is supportive. Research by Burgoyne, Hambrick, Moser, and Burt (2018) found that a brief online intervention targeting intelligence mindset, locus of control as well as motivation and self-determination were able to increase the participants reported levels across all variables. While certain research findings have demonstrated the potential of mindset interventions, in the case of McCabe, Kane-Gerard, and Friedman-Wheeler (2020), they found no impact on self-reports and outcomes of higher retention and grade point average, respectively. This occurred when addressing growth mindsets related to intelligence through a 11-minute TED talk on mindset, an information session about the characteristics of growth versus fixed mindsets, as well as five reflective questions on the topic.

Research has not fully clarified the impact of mindset interventions, however these seem to highly depend on the domain specific topic of mindset, such as intelligence, emotion, or anxiety, the length and type of the intervention, as well as the expected outcome measure



(Schroder, Callahan, Gornik, & Moser, 2019). The current research findings when situated in previous literature implies a causal relationship between perfectionism and psychological distress symptoms that may be mediated by an individual's mindset about anxiety, as well as disordered social media use. The implications of these results for counselling demonstrate potential treatments options to address psychological distress and perfectionism through mindset. These specific treatments must be catered to the specific domain of mindset, as beliefs about intelligence, personality, and emotion, may play a lesser role in psychological distress for perfectionism. As well, it is essential to further clarify the optimal mindset intervention through manipulation checks to ensure that these treatments are in fact influencing and shifting the client's mindset. While social media use cannot act as an intervention, if an individual is struggling with perfectionism, this framework can orient interventions, as specific motives and behaviours while using social media may have a higher impact on their mental health. Even though these preliminary results and previous research findings suggest the strong intervention potential of mindset, future research needs to address if other domains of mindset, such as anxiety are similarly malleable with interventions. If this is the case, then the mediation found between perfectionism and psychological distress symptoms could be addressed through a mindset intervention to improve more maladaptive forms of perfectionism towards adaptive forms.

### **Limitations**

While this research design is merely correlational, it limits the generalizability and causal connection between these factors. The results found that perfectionism is moderately correlated to psychological distress symptoms, and mindset about anxiety is a significant mediator within this path model, implying a potential causal path, but because this research is from survey data, it

cannot conclude any tangible causal evidence. The results must be contextualized as possible causal connections between perfectionism, anxiety mindset, and psychological distress symptoms. This anxiety mindset model may act as a steppingstone to uncover further research results that can experimentally confirm the causal connection between perfectionism, mindset about anxiety and psychological distress symptoms. It may be the case that higher perfectionism plays a causal role in an individual's mindset about anxiety, potentially causing more fixed beliefs about anxiety, which in turn may cause higher psychological distress symptoms. It can also be hypothesized, that an individual's beliefs about their anxiety, whether a fixed or growth mindset, could play a causal role in the resulting psychological distress, which could be distinguished as adaptive or maladaptive perfectionism. Future research may also experimentally confirm the causal connection between perfectionism, disordered social media use and psychological distress symptoms. To support these hypotheses, further evidence is required to clarify if adaptive perfectionism is facilitated by an individual's mindset and if psychological distress from perfectionism is caused by disordered social media use.

It is important to note that the bias-corrected method bootstrapping for the indirect effect between FMPS and DASS-21 through SMDS, Personality Mindset and Intelligence Mindset, respectively, were found to be statistically significant ( $\beta = .081$ ,  $p < .009$  and  $\beta = .085$ ,  $p < .003$ ). Relative to Emotion Mindset, the results found a similar indirect effect ( $\beta = .083$ ,  $p < .009$ ). While these three path models show less of a mediation effect, they do have smaller beta values and stronger p-values from this bootstrapping method compared to Anxiety Mindset ( $\beta = .193$ ,  $p < .018$ ). This may represent a larger amount of potential error in the anxiety path model. As we did not assess the significance of this error comparatively to the other models, we can only note this as a limitation in the strength of these research results.

A final noted limitation in this study is within the social media measure. The present study assessed social media use that was considered disordered through the many characteristics such as addictive tendencies, avoidance, secretive use, and tolerance. While research from Padoa, Berle, and Roberts (2018) used a more general measure of social media exposure assessing how many hours per day they spent observing or engaging with websites such as Facebook and Instagram, this methodological approach may facilitate a clearer understanding of social media use as a construct, compared to just disordered use. It may be the case that different measures of social media use demonstrate differing mediation effects.

## **Conclusion**

The current research with a sample of 239 participants that completed scales of perfectionism, psychological distress symptoms, mindset, and disordered social media use, sought to assess the direct and indirect effects of social media use and mindset as potential mediators of the relationship between perfectionism and psychological distress. Results found that a domain specific mindset about anxiety significantly mediated this relationship as well as disordered social media use. It may be the case that those with perfectionism are more likely to engage with social media in disordered ways and thus experience more psychological distress symptoms. While this research is merely correlational, the path model also suggests that there is potential for more adaptive forms of perfectionism with less psychological distress within growth mindsets about anxiety. Future research will need to empirically replicate these results with experimental methods.

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## Appendix 1

## FMPS.

Please answer the following questions in relation to how much they apply to you from (1 = Strongly agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly disagree). Do not spend too much time on any one question.

1. My parent set very high standards for me.
2. Organization is very important to me.
3. If I do not set the highest standards for myself, I am likely to end up a second-rate person.
4. If I fail at work/school, I am a failure as a person.
5. I usually have doubts about the simple everyday things that I do.
6. Only outstanding performance is good enough for my family.

## DASS 21.

Please read each statement and circle a number 1, 2, 3, or 4 (1 = Applied to me very much, or most of the time, 2 = Applied to me to a considerable degree, or a good part of time, 3 = Applied to me to some degree, or some of the time, 4 = Did not apply to me at all) which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

1. I found it hard to wind down.
2. I couldn't seem to experience any feeling at all.
3. I tended to over-react to situations.

4. I feel that I had nothing to look forward to.

5. I felt that life was meaningless.

6. I felt I was close to panic.

Implicit Mindset Scale.

Please indicate the extent to which you agree or disagree with each of the following statements

(1 = Strongly agree, 2 = Agree, 3 = Slightly agree, 4 = Slightly disagree, 5 = Disagree, 6 = Strongly disagree)

Theories of Personality Scale:

1. The kind of person someone is is something very basic about them and it can't be change very much.

2. People can do thing differently, but the important parts of who they are can't really be changed.

Theories of Intelligence Scale:

1. You have a certain amount of intelligence and you really cannot do much to change it.

2. Your intelligence is something about you that you cannot change very much.

Theories of Emotion Scale:

1. Everyone can learn to control their emotions.

2. If they want to, people can change the emotions that they have.

Theories of Anxiety Scale:



1. You have a certain amount of anxiety and you really cannot do much to change it.
2. Your anxiety is something about you that you cannot change very much.

Social Media Disorder Scale. Read each statement and indicate yes (1) or no (2) as it applies to you.

During the past year, have you...

1. ...often found it difficult not to look at messages on social when you were doing something else (e.g. school work)?
2. ...felt the need to use social media more and more often?
3. ... often felt tense or restless if you weren't able to look at your messages on social media?
4. ...tried to reduce your use of social media, but failed?
5. ...regularly used social media to take your mind off your problems?
6. ...often not paid attention at school, while doing homework or at work because you were using social media?
7. ...regularly lied to your parents or friends about the amount of time you spend on social media?
8. ...regularly devoted no attention to people around you (e.g. family or friends) because you were using social media?
9. ...had serious problems at school or at work because you were spending too much time on social media?

## Appendix 2

### **Researcher:**

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780-492-7979

### Background

- You are invited to participate in this study to explore the mental/emotional states related to mindset, perfectionism, and depression.
- This research is being completed by a University of Alberta graduate student. Results of this study will be used in support of my thesis for the MEd Counselling Psychology program. Research findings may also be published in an academic journal.

### Purpose

- The purpose of this study is to understand the relationship between perfectionism, social media use, as well as our thoughts and feelings. We are collecting data from this survey from a wide range of adult participants to understand the connection between social media use, perfectionism, mindset, and emotions. Results of this study will be used to develop a model for how cognitive states influence perfectionism and negative emotions, adding to scientific knowledge about the topic.

### Study Procedures

- This study consists of an online survey that can be completed from any computer or mobile device. Time commitment for this study is about 30 minutes.
- By clicking this link, you have been brought to this online survey where all the data collected from you will be anonymous to make sure we protect your confidentiality.
- The online survey will ask demographic questions, such as age, ethnicity, student status and education, along with questions about mindset, perfectionism, depression as well as social media use.

### Benefits

- You might not directly benefit from being in this study. We hope results from this project will help us better understand how and individual's mindset impacts their mental and emotional states.
- There are no known costs involved in being in the research.

### Risk

- There are no known or anticipated risks to you by participating in this study, however, reflecting on personal experiences or past behaviours might be distressing for some individuals. If you feel so

distressed that you are worried about your safety, you may contact Student Counseling & Clinical Services at 780-492-5205, the Mental Health Helpline at 1-877-303-2642, or go to your nearest Emergency Room.

### Voluntary Participation

- You are under no obligation to participate in this study. Your participation is voluntary, and you can withdraw at any time simply by exiting the survey.
- If you agree to be in the study, you can change your mind and quit at any time without penalty by closing your browser. If you withdraw before completing the study, we will not include your data within the analysis and will delete all of your data. Once you complete the questionnaire fully, your data will be recorded and used within the research. As the data is anonymous, if you complete the questionnaire fully and do not withdraw before finishing the survey, we will not be able to locate your data within the sample.

### Confidentiality & Anonymity

- This research will be used for my thesis and may be published in a research journal. All data from you will be combined with others, with no attached identifying material, meaning that the researcher will not know who chooses to participate or not.
- All data is kept confidential with only the primary researcher and supervisor having access. You should know that the survey portion of this study is collected on software housed in the United States. This means that under US privacy laws, the government has the right to access all information held in electronic databases like the one used to collect this survey data. However, no identifying information will be attached to your survey data.
- Data is stored for a minimum of 5 years following completion of the research project, at which point it will be destroyed through electronic file deletion. All data will be stored in electronic form in password protected files on an encrypted computer.
- If you would like a copy of the results you can email the primary researcher, Adrian Johnson, at the contact information above about 1 year after your participation.
- Researchers may use the data collected in this study in future research projects, but if they do this it will have to be approved by a Research Ethics Board.

### Further Information

- If you have further questions about this study, please contact the primary researcher, Adrian Johnson, or Dr. Whelton at the contact information above. The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. The REB number is Pro00099231. If you have questions about your rights or how research should be conducted, call [780-492-0459](tel:780-492-0459) or email [reoffice@ualberta.ca](mailto:reoffice@ualberta.ca). This office is independent of the researchers.

### Consent Statement

**By clicking next and continuing with the survey, I have read this form and the research study has been explained to me. I am age 18 or over. I have been given the opportunity to ask questions and have been told whom to contact. I agree to participate in the research study described above. Completion and submission of the survey implies your consent to participate.**

## Appendix 3

Please write or tick the appropriate circle for each question

Age:

Gender:

Ethnicity:

Occupation/Student status:

Education:

- Primary school
- Some high school, but no diploma
- High school diploma (or GED)
- Some college, but no degree
- 2-year college degree
- 4-year college degree
- Graduate-level degree
- None of the above

How did you hear about the study?:

- Online
- University email
- Word of mouth
- Other \_\_\_\_\_

## Appendix 4

**Researcher:**

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Purpose

- The purpose of this study is to understand how mindset impacts perfectionism, as well as depressive symptoms such as anxiety and sadness. We are collecting data from a wide range of normal adults to understand the trend between social media use, perfectionism, depressive symptoms, and mindset.
- Research distinguishes two forms of perfectionism, where maladaptive perfectionism is characterized by intense rumination about making mistakes, constant self-doubt, harsh self-criticism, and unreasonably high expectations<sup>1</sup>. Comparatively, individuals with adaptive perfectionism are more flexible to make errors, and ultimately view their efforts as satisfying and valuable<sup>2</sup>. Two opposing mindsets have been defined in research: a growth mindset and a fixed mindset. A growth mindset is the belief that individual characteristics can be developed and changed over time, whereas a fixed mindset views these traits as fixed and unchangeable<sup>3</sup>.
- We hope results from this project will help us better understand how mindset relates to perfectionism as well as emotional state to provide a model to inform interventions addressing maladaptive forms of perfectionism.
- References:
  - <sup>1</sup>Dunn, J. C., Whelton, W. J., & Sharpe, D. (2006). Maladaptive perfectionism, hassles, coping, and psychological distress in university professors. *Journal of counseling psychology*, 53(4), 511.
  - <sup>2</sup>Hamachek, D. E. (1978). Psychodynamics of normal and neurotic perfectionism. *Psychology: A Journal of Human Behavior*.
  - <sup>3</sup>Rattan, A., Savani, K., Chugh, D., & Dweck, C. S. (2015). Leveraging mindsets to promote academic achievement: Policy recommendations. *Perspectives on Psychological Science*, 10(6), 721-726.

What is next?

- If you would like information about study results, please contact Adrian Johnson at [apjohnso@ualberta.ca](mailto:apjohnso@ualberta.ca). Final results of the study should be available in late 2021.
- If you have concerns about your rights as a participant, you may contact the Research Ethics Office: [780-492-0459](tel:780-492-0459) or [reoffice@ualberta.ca](mailto:reoffice@ualberta.ca) REB number is Pro00099231.

Talking about personal experiences can sometimes be difficult. If you feel upset after the interview, please feel free to discuss any distress with the researcher. If you feel so distressed you are worried about your safety, please contact Student Counseling & Clinical Services at 780-492-5205, the Mental Health Helpline at 1-877-303-2642, or go to your nearest Emergency Room.

**By pressing submit, you are agreeing to have your data used for research purposes.**

**Thank you for participating in this research study!**