Understanding Procrastination in First-year Undergraduate Students: An Application of Weiner's (1985) Attribution Theory

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Abstract

Undergraduate students procrastinate their academic tasks on a regular basis with first-year students tending to underestimate the time required to accomplish academic tasks and engaging in high degrees of procrastination. Although procrastination has been widely investigated, the students' perceived reasons for procrastination and its effects on emotions is lacking. The present exploratory study utilized Weiner's (1985) attribution theory to examine the relationships between procrastination as well as students' causal explanations and emotions specific to procrastination. Findings with 429 first-year undergraduates showed students to attribute procrastination mainly to internal and unchangeable factors, and less so to personally controllable factors. Students who attributed procrastination to reasons within themselves tended to report higher levels of negative emotions, with strong direct effects of procrastination on negative emotions also observed. These findings demonstrate the importance of considering students' causal attributions as potential contributors to their emotional experiences surrounding procrastination and encourage future research to examine the longitudinal relations between procrastination, attributions, and emotion outcomes.

Keywords: Procrastination, attributions, emotions, first-year university students

Abrégé

Les étudiants de premier cycle universitaire procrastinent régulièrement sur leurs tâches académiques. Les étudiants de première année, en particulier, ont tendance à sous-estimer le temps requis pour leurs tâches académiques et tendent à procrastiner de manière importante. Bien que la procrastination ait fait l'objet de nombreuses recherches, les raisons pour lesquelles les étudiants procrastinent et leurs effets sur les émotions sont peu connus. La présente étude exploratoire a utilisé la théorie d'attribution de Weiner (1985) afin d'examiner les relations entre la procrastination, les explications causales des étudiants, ainsi que les émotions spécifiques reliées à la procrastination. 429 étudiants de première année au premier cycle universitaire ont participé à cette étude. Les données récoltées auprès de ces étudiants ont démontré que les étudiants attribuaient la procrastination principalement à des facteurs internes et non modifiables et moins à des facteurs contrôlables personnellement. Les étudiants qui attribuent la procrastination à des raisons intrinsèques ont tendance à signaler des niveaux plus élevés d'émotions négatives, avec des effets directs importants de la procrastination sur les émotions négatives. Ces résultats démontrent l'importance de considérer les attributions causales des étudiants comme des contributeurs potentiels à leurs expériences émotionnelles autour de la procrastination et encouragent les recherches futures à examiner les relations longitudinales entre procrastination, attributions et résultats émotionnels.

Mots-clés: Procrastination, attributions, émotions, étudiants universitaires de premier cycle

Introduction

Over 70% of undergraduate students report procrastinating on academic tasks (Ellis & Knaus, 1977; Ferrari, Diaz-Morales, O'Callaghan, Diaz, & Argumedo, 2007; Schraw, Wadkins, & Olafson, 2007; Steel, 2007) with procrastination having been consistently shown to have negative effects on students' academic performance (Balkis, Duru, & Bulus, 2013; Gareau, Chamandy, Klijajic, & Gaudreau, 2018; Kim & Seo, 2013; Kim & Seo, 2015), psychological well-being (Schraw et al., 2007; Tice & Baumeister, 1997), and emotions (e.g., anxiety; Fritzsche, Young, & Hickson, 2003). In particular, first-year undergraduate students struggle to effectively manage their time and tend to procrastinate as a result of overestimating their ability to achieve their goals in their first semester (Thibodeaux, Deutsch, Kitsantas, & Winsler, 2017). First-year students are more susceptible to academic procrastination due to varied novel opportunities (e.g., socialization, volunteering, athletics) they encounter as part of adapting to post-secondary education. First-year students also express difficulty coping with novel challenges in university settings (e.g., academic setbacks and decisions, greater autonomy; Perry, Hladkyj, Pekrun, & Pelletier, 2001) potentially due to unrealistic expectations based on their high-school experiences (Thibodeaux et al., 2017). The first-year experiences are thus crucial for understanding student motivation, success, and persistence (Gardner, 1986; Tinto, 1993), as is the research need for a better understand the reasons underlying academic procrastination in this population. In order to implement remedial intervention programs to reduce procrastination among first-year students, additional research is needed to directly explore students' perceived reasons for this maladaptive behaviour.

Procrastination has attracted research interest in a wide array of fields, encouraging researchers to uncover potential causes of student procrastination. Existing research has

examined some of the potential predictors of procrastination among university students including cognitive and meta-cognitive strategies (Howell, Watson, Powell, & Buro, 2006; Howell & Watson, 2007), emotions (Ferrari, Barnes, & Steel, 2009; Tice & Baumeister, 1997), personality traits (Hess, Sherman, & Goodman, 2000), and motivational variables (e.g., personal control: Janssen & Carton, 1999; self-efficacy: Klassen, Krawchuck, & Rajani, 2008). Although procrastination has been regarded as a maladaptive behaviour due to its negative effects on academic achievement and well-being, some researchers assert that procrastination may also produce positive learning outcomes (e.g., "active" procrastination; Choi & Moran, 2009; Chu & Choi, 2005). It is thus worthwhile to consider how individuals themselves perceive procrastination as to its risks, benefits, and underlying causes (Park & Sperling, 2012). Overall, research on procrastination has focused on identifying potential antecedents, mediators, moderators and outcomes of procrastination, benefiting the general understanding of the construct. However, limited research has been conducted on students' personal explanations for why they procrastinate and how those explanations may influence other potential outcomes, such as emotions (Gargari, Sabouri, & Nozard, 2011; Hoppe, 2011).

One particularly useful theoretical perspective that could help to understand students' self-generated explanations for their procrastination is Weiner's (1985) attribution theory. Weiner's (1985) attribution theory emphasizes the role of causal ascriptions individuals make for negative, important, or unexpected outcomes due to their assumed effects on cognitive, affective, and behavioural outcomes. In educational contexts, attribution theory has been used to explore the effects of students' causal attributions for academic success or failure on learning and achievement outcomes (e.g., performance; Griffin, Combs, Land, & Combs, 1983; procrastination; Gargari et al., 2011; self-regulation; Dunn, Osborne, & Link, 2012). In line with

attribution theory, attributional retraining (AR) has been developed as a motivational intervention that encourages individuals to adopt controllable attribution for their past poor performance to help sustain persistence and achievement despite setbacks. The adoption of controllable attributions for academic failures has been shown to help students improve academic performance and reduce course withdrawal (Hamm, Perry, Clifton, Chipperfield, & Boese, 2014; Haynes, Perry, Stupnisky, & Daniels, 2009; Yeager et al., 2014).

Theories of procrastination and attributions are related in that they imply strong associations with both positive and negative emotions. Emotional experiences are important factors for student engagement (Kahu, Stephens, Leach, & Zepke, 2015), self-regulated learning (Mega, Ronconi, & De Beni, 2014), and achievement (Pekrun, Goetz, Titz, & Perry, 2002). Procrastination has been found to either provoke negative emotions (e.g., anxiety, Solomon & Rothblum, 1984; shame, Fee & Tangney, 2000; guilt, Pychyl, Lee, Thibodeau, & Beck, 2000) or be elicited by negative emotions (Balkis & Duru, 2016; Baumeister & Heatherton, 1996; Siroris & Pychyl, 2013). According to Weiner's (1985, 2000, 2006, 2010) intrapersonal attribution theory, negative emotions like helplessness can also be elicited due to attributing negative outcomes to stable and permanent factors (e.g., ability, intelligence). In contrast, individuals should experience feelings of hope when they ascribe negative outcomes to personally controllable factors (e.g., lack of effort, ineffective strategies). Thus, emotional experiences represent a potential common link between students' experiences of procrastination and their causal attributions for academic setbacks.

To address the persistently high rates of academic procrastination in university students (Balkis & Duru, 2009; Klassen et al., 2008; Klassen et al., 2010; Özer, Demir, & Ferrari, 2009; Solomon & Rothblum, 1984), more research is needed to investigate students' perceived reasons

for this maladaptive behaviour so as to develop effective intervention programs for students. Therefore, the present exploratory study examined the relationships between procrastination, causal attributions, and positive/negative emotional experiences in first-year university students from the perspective of Weiner's (1985) attribution theory. The first part of the study offers a literature review explaining the current perspectives of procrastination (e.g., underregulation versus misregulation) as well as Weiner's attribution theory, with a specific focus on the relationships between procrastination, attributions, and emotions in university students. Empirical findings on the relationships between procrastination, causal attributions, and emotional experiences as assessed using structural equation modeling are subsequently presented, followed by a discussion of the study limitations and implications.

Literature Review

Current Perspectives on Procrastination

Procrastination has been explored in diverse achievement contexts and included a variety of populations including university students, faculty, young adults, and employees over the past few decades. Procrastination is commonly described as a gap between intention and implementation of behaviours and is typically referred to as a self-regulatory failure (Baumeister & Heatherton, 1996; Howell & Watson, 2007; Pychyl, 2013; Steel, 2007). From a self-regulated learning (SRL) perspective, procrastination is understood as a maladaptive behaviour resulting from poor self-regulation to accomplish one's desired goals (Howell et al., 2006; Steel, 2007; Tuckman, 1991). Self-regulated learning is markedly different from procrastinating as it involves more effective strategies to monitor the learning process and orient toward mastery-approach goals (Lynch, 2010; Schunk & Ertmer, 2000; Wolters, 2003). Accordingly, empirical studies have shown self-regulated learning behaviours (e.g., cognitive, meta-cognitive, and motivational

strategies) to be negatively associated with procrastination (Howell et al., 2006; Howell & Watson, 2007; Wolters, Wo, & Hussain, 2017).

Moreover, researchers have proposed two theoretical rationales for explaining procrastination as a self-regulation failure, referred to as the (a) underregulation hypothesis and (b) misregulation hypothesis (Balkis & Duru, 2016; Baumeister & Heatherton, 1996). Both rationales suggest that procrastination has a negative impact on emotional well-being (Balkis & Duru, 2016; Schraw et al., 2007; Pychyl et al., 2000; Tice & Baumeister, 1997) with each rationale offering a different explanation with regard to self-regulation processes. For instance, the *underregulation hypothesis* argues that ineffective self-regulation abilities (e.g., poor learning strategies, time management; Lay & Schouwenburg, 1993; Senécal, Koestner, & Vallerand, 1995; Steel, 2007) could result in procrastination and negative emotions. On the other hand, the *misregulation hypothesis* proposes that prioritizing the experiences of negative emotions over attaining achievement goals (e.g., focus on emotional regulation) can lead to procrastination and eventual failure to achieve one's goals (Baumeister & Heatherton, 1996; Pychyl & Sirois, 2016). The present study is based more on the self-regulated learning (SRL) perspective (underregulation) than the emotion regulation perspective (misregulation), however both hypotheses are relevant given that they both imply links with emotions as either consequences (underregulation) or antecedents (misregulation) of academic procrastination.

Academic Procrastination

The word procrastination is derived from the Latin word "procrastinus" (pro: forward; crastinus: for tomorrow) and has been defined in the psychology literature as a dysfunctional phenomenon in which people needlessly delay a task or action that must be completed a later time (Klein, 1971; Steel, 2007). Thus, procrastination involves needless delays on tasks or

behaviours despite individuals foreseeing the negative consequences thereof. Research on procrastination with university students has focused mainly on irrational delay on academic tasks (e.g., class attendance, weekly reading assignments, academic writing, and exam preparation; Özer et al., 2009). An example of academic procrastination in university students would be watching Netflix despite an urgent deadline for term papers or exams. Although students are consciously aware of required tasks and deadlines, they irrationally decide to procrastinate as indicated by statements such as "I will do it tomorrow" or "I will do it right before the deadline." More than half of the undergraduates report regularly procrastinating on assignments or waiting until the last minute to study (Ferrari et al., 2007; Özer et al., 2009; Schraw et al., 2007; Steel, 2007). Some findings further suggest that students may engage in procrastination up to one or two hours a day (Klassen et al., 2008, 2010), with other studies showing university students to regularly submit academic assignments especially close to the deadline (Howell et al., 2006).

Procrastination in university students has been empirically studied with respect to the types, prevalence, and correlates of procrastination in order to better develop initiatives to minimize this maladaptive behaviour. However, the current literature in procrastination in university students is unfortunately confounded methodologically due to a lack of consistent self-report measures (e.g., overall vs. academic procrastination). For the present literature review, the findings related to both general procrastination in university students and academic procrastination will be reviewed to provide a more comprehensive perspective on existing research on this important maladaptive behaviour. It should additionally be acknowledged that most of the previous studies are correlational and cross-sectional in nature, thus preventing inferences of causality between procrastination and other variables.

Frequency of procrastination. Findings from Solomon and Rothblum (1984) showed that around 50% of university students report frequently procrastinating on writing papers, with 30% procrastinating on weekly reading assignments, and around 30% procrastination on studying for tests. Findings suggest that over 90% of university students frequently engage in procrastination (Ellis & Knaus, 1977; Steel, 2007), with approximately half of students identifying themselves as chronic procrastinators (Day, Mensink, & O'Sullivan, 2000; Haycock, 1993; Solomon & Rothblum, 1984). Pychyl et al. (2000) further showed university students tend to procrastinate by engaging in activities such as watching television, taking breaks (e.g., sleeping), conversations with family or friends, and gaming. The high prevalence of procrastination has been consistently reported in literature, with findings typically suggesting that university student engage in procrastination one to two hours daily, despite recognizing the negative impact of procrastination on their academic performance (Klassen et al., 2008, 2010). Accordingly, previous studies have concentrated on identifying potential correlates of procrastination so as to reduce the high rates of procrastination among university students.

Correlates of procrastination. With respect to *demographic correlates* of procrastination in university students, studies have reported gender differences demonstrating that male students engage in procrastination more than female students (Milgram, Marshevsky, & Sadeh, 1994; Özer et al., 2009). Female students have also been found to be more likely to procrastinate due to fear of failure than male students, with male students engaging in procrastination more often due to rebellious reasons (Özer et al., 2009). Although similar gender differences in procrastination have been reported in other studies (Rothblum, Solomon, & Murakami, 1986; Solomon & Rothblum, 1984; level of anxiety, Lynch, 2010), some studies did not detect gender differences (Ferrari, Parker, & Ware, 1992; Ferrari, 2000; Hess et al., 2000).

Age has also been identified as a correlate of procrastination in university students, with studies showing students over 20 years of age to be less likely to procrastinate than younger students (Beswick, Rothblum, & Mann, 1988; Steel, 2007; Schouwenburg, 2004). As students become older and more mature, procrastination frequency appears to decrease (Jiao, DaRos-Voseles, Collins, & Onwuegbuzie, 2011; Özer et al., 2009).

Concerning the academic correlates of procrastination, Özer (2011) examined potential differences in the prevalence of procrastination as a function of educational level (e.g., high school, undergraduate, and graduate school), showing undergraduates to report higher frequencies of procrastination in comparison to high school or graduate students. Whereas high school and undergraduate students reported procrastinating most on studying for exams, graduate students engaged in procrastination most when writing a scholarly paper (Özer, 2011). Previous studies have also consistently found a negative relationship with academic performance (Gareau et al., 2018; Kim & Seo, 2015; Klassen et al., 2008; Michinov, Brunot, Le Bohec, Juhel, & Delaval, 2011; Moon & Illingworth, 2005). Students who tended to procrastinate showed poorer academic performance compared to students who did not procrastinate (Balkis et al., 2013; Klassen et al., 2010; Patrzek, Grunschel, & Fries, 2012; Roig & DeTommaso, 1995; Steel, Brothen, & Wambach, 2001).

Psychological correlates have also been examined in correspondence with academic procrastination including both personality traits (Balkis & Duru, 2007; Hess et al., 2000; Steel & Klingsieck, 2016) and motivational variables (e.g., self-regulation, Senécal et al., 1995; Wolters, 2003; Wolters et al., 2017; locus of control, Janssen & Carton, 1999; self-efficacy; Haycock, McCarthy, & Skay, 1998; Klassen et al., 2008, 2010; achievement goal orientations, Howell & Watson, 2007). Among the Big Five personality traits, neuroticism has been found to be strongly

related to procrastination (Balkis & Duru, 2007; Hess et al., 2000), with students reporting higher degrees of procrastination when they also reported higher trait levels of anxiety, fear, guilt, and depression. However, other studies do not demonstrate a relationship between neuroticism and procrastination (Steel et al., 2001), and instead show conscientiousness to be a negative correlate of procrastination (Steel & Klingsieck, 2016). When students were better able to control their impulsive behaviours and diligently organize their tasks, they were less likely to engage in procrastination. Higher levels of self-regulation have also been found to be negatively associated with procrastination (Senécal et al., 1995), with university students who utilize cognitive and meta-cognitive strategies to monitor their learning reporting lower procrastination (Wolters, 2003; Wolters et al., 2017).

Concerning the role of internal, motivational factors in student procrastination, Janssen and Carton (1999) found students who reported an internal locus of control (e.g., effort) for their academic outcomes to be less likely to procrastinate and start their assignments earlier than students with an external locus of control. Furthermore, low self-efficacy has also been found to strongly correspond with greater procrastination (Haycock et al., 1998; Wolters, 2003), with student who are less confident with respect to completing academic tasks (e.g., class project) showing higher levels of procrastination. Similarly, Klassen et al. (2008) showed university students with high perceived capabilities to effectively monitor and orient their learning to report a lower prevalence level of procrastination (see also Klassen et al., 2010). Concerning the potential role of achievement goal orientations, findings suggest that performance goal orientations are not related to student procrastination (McGregor & Elliot, 2003), with mastery-avoidance goals corresponding with higher procrastination levels (Howell & Watson, 2007). Findings from Howell and Watson (2007) also showed mastery-approach goals to be negatively

related to procrastination, suggesting that personal goals to improve one's learning can diminish the frequency of needless delay. In contrast, students who were motivated to avoid learning less than possibly could (e.g., mastery-avoidance) tended to procrastinate more, likely due to task aversiveness (Moller & Elliot, 2006). Given the common conceptualization of procrastination as a self-regulatory failure, it is perhaps not surprising that psychological correlates of procrastination have been extensively explored in relation to this maladaptive phenomenon.

Correlates of active vs. passive procrastination. Although most procrastination researchers have considered procrastination as maladaptive for students' learning and academic performance, Chu and Choi (2005) asserted that procrastination could be adaptive and possibly lead to desirable academic achievement outcomes. This alternative perspective is typically referred to as "active" procrastination (Chu & Choi, 2005) that is comprised of four factors including "(a) preference for pressure, (b) intentional delay to procrastinate, (c) ability to meet deadlines, and (d) outcome satisfaction (Choi & Moran, 2009, p. 197-198)." Active procrastinators thus prefer working under pressure and purposefully delay academic tasks until the last minute. Despite postponing their works until immediately before a deadline, active procrastinators tend to feel confident in their ability to complete the task, to manage their time (time control), and obtain better grades than typical "passive" procrastinators (Chu & Choi, 2005). Choi and Moran (2009) and Seo (2012) also found the four types of active procrastination, to differ significantly from the traditional form of procrastination.

Empirical studies on active procrastination show inconsistent findings when contrasting active and passive procrastination (Chowdhury & Pychyl, 2018; Corkin, Yu, & Lindt, 2011; Hensley, 2014). For example, researchers who advocate for active procrastination have found it to correspond with better academic performance (Kim, Fernandes, & Terrier, 2017; Seo, 2012),

creativity (Liu, Pan, Luo, Wang, & Pang, 2017), and high-order thinking (Lee, 2013). However, other findings show limited evidence to distinguish active from passive procrastination (Wolters et al., 2017) and challenge the construct validity of active procrastination as instead representing an active form of delay (Chowdhury & Pychyl, 2018). Consistent with Pychyl (2009) who stated, "*all procrastination is delay, but not all delay is procrastination*" (p.1), Lindt, Corkin, and Yu (2014) also identified active procrastination as instead active delay; an adaptive strategy associated with high self-efficacy. Students who were confident in their ability perceived their purposeful delay as an effective learning strategy (Schraw et al., 2007). When aligned with higher level of self-efficacy, Lindt and colleagues (2014) thus proposed that intentional delay could serve an adaptive function for students. Overall, perspectives on the differentiation between active and passive procrastination in recent published research are mixed, with researchers both discouraging the conceptualization of active procrastination as a distinct subtype of procrastination (Cao, 2012b; Corkin et al., 2011; Chowdhury & Pychyl, 2018; Hensley, 2014, 2016), and others reaffirming active procrastination as a critical procrastination dimension (Kim et al., 2017; Lee, 2013; Liu et al., 2017; Park & Sperling, 2012; Seo, 2012, 2013). Beyond these conflicting findings, existing research on procrastination thus acknowledges that individuals can strongly differ in their beliefs about procrastination with respect to not only its potential causes as well as consequences.

Students' beliefs about procrastination. Procrastination has been proposed to incorporate cognitive, affective, and behavioural components (Rothblum et al., 1986). In a recent paper by Cao (2012a), the cognitive component, especially beliefs concerning the efficacy of procrastination, has been highlighted as important to understanding procrastination frequency. Undergraduate students who believed that procrastination could be useful to themselves (e.g.,

creativity) showed high tendencies to actually procrastinate, over and above the effects of academic self-efficacy and achievement goal orientations (Cao 2012a). In other words, undergraduates' beliefs about procrastination served as a strong predictor of procrastination than other more general academic motivational variables regarded as critical correlates of learning outcomes (e.g., self-efficacy, Haycock et al., 1998; Klassen et al., 2008). Similarly, findings from a mixed-method study by Park and Sperling (2012) showed a student who perceived their procrastination as purposeful and effective to express confidence in her belief that intentional procrastination prompted her to finish tasks on time by working under pressure. As positive perceptions of procrastination are not assessed in traditional self-report measures (e.g., Procrastination Assessment Scale-Students, Solomon & Rothblum, 1984; Pure Procrastination Scale, Steel, 2010; Tuckman Procrastination Scale; Tuckman, 1991), further research is needed to examine the empirical significance of students' beliefs about procrastination.

Procrastination and emotional well-being. As outlined above, understanding students' emotions is critical to understanding academic procrastination. For example, task aversiveness and fear of failure have been repeatedly identified as the primary reasons for why students procrastinate (Blunt & Pychyl, 2000; Özer et al., 2009; Solomon & Rothblum, 1984). Students, who report frequent procrastination have also been found to express higher levels of more specific negative emotions such as guilt (Schraw et al., 2007), shame (Fee & Tangney, 2000), anger (Ferrari & Olivette, 1994), anxiety (Solomon & Rothblum, 1984), helplessness (McKean, 1994), and even depression (McCown, Johnson, & Petzel, 1989). Procrastination has also been shown to correspond with lower levels of positive emotions such as hope (Alexander & Onwuegbuzie, 2007) and higher levels relief, for example, when students who procrastinated on academic tasks submit their assignments (Tice & Baumeister, 1997).

Moreover, students often report using procrastination to regulate their negative emotions (i.e., the misregulation hypothesis; e.g., anxiety; Blunt & Pychyl, 1998; guilt, Pychyl et al., 2000), thus using procrastination to temporarily avoid negative emotions by disengaging from a situation or task (Pychyl, 2013; Tice & Baumiester, 1997). Findings from an emotion regulation perspective similarly show students who experience low positive affect on an academic task to be more likely to procrastinate when tempted with an alternate, more enjoyable activity (Sirois & Giguere, 2018). However, research also reveals the potential emotional benefits of procrastination to not last long due to compromised potential to achieve one's long-term goals (Pychyl, 2013; Tice & Bratslavsky, 2000). In fact, findings typically show students who use procrastination to escape negative emotions to actually experience greater anxiety and lower self-esteem as a result (Solomon & Rothblum, 1984). Although cross-sectional in nature, existing empirical findings clearly highlight the associations between academic procrastination and emotions, especially in undergraduate students.

Weiner's Attribution Theory

According to Weiner's (1985) attribution theory, individuals attempt to interpret the causes of performance outcomes in educational settings so as to maximize future opportunities for goal attainment. Individual's attributions further determine the amount of time and effort that they will invest in order to accomplish their desired achievement goals. If a student has interpreted a cause of poor grades to permanent factors (e.g., lack of educational resources), he or she might not exert sufficient effort to achieve better grades. Attribution theory thus includes psychological constructs pertaining to both expectancy of future success and the degree of value attached to performance tasks. The motivational sequence in this theory states that causal ascriptions have specific emotional consequences that, in turn, lead to behavioural outcomes (i.e.,

a “thinking-feeling-doing” model). If the event is negative, unexpected, or important to an individual, it is assumed to provoke one to search for reasons why the event happened. How one attributes the negative event is then proposed to generate different types of emotions (e.g., guilt, hope, helplessness) that eventually impact achievement behaviours. For example, if a student perceived that a poor test result was caused by external factors under the control of others (e.g., teacher’s lack of instructional skills), it would be expected to elicit feelings of anger toward the teacher as well as lowered persistence and disobedience in the classroom.

Weiner further proposed two different applications of attribution theory, namely an interpersonal perspective referring to as one’s judgment of others’ outcomes, and an intrapersonal perspective involving one’s judgment of their personal experiences (Weiner, 1992). The interpersonal perspective could be easily applied to understand the viewpoint of teachers when a student is misbehaving or failing in school. The intrapersonal perspective of attribution theory depicted in Figure 1 instead reflects students’ own explanations for their behaviour or performance outcomes. In the present study, the intrapersonal perspective of attribution theory was adopted to explore first-year students’ personal explanations for their negative academic behaviours (e.g., procrastination).

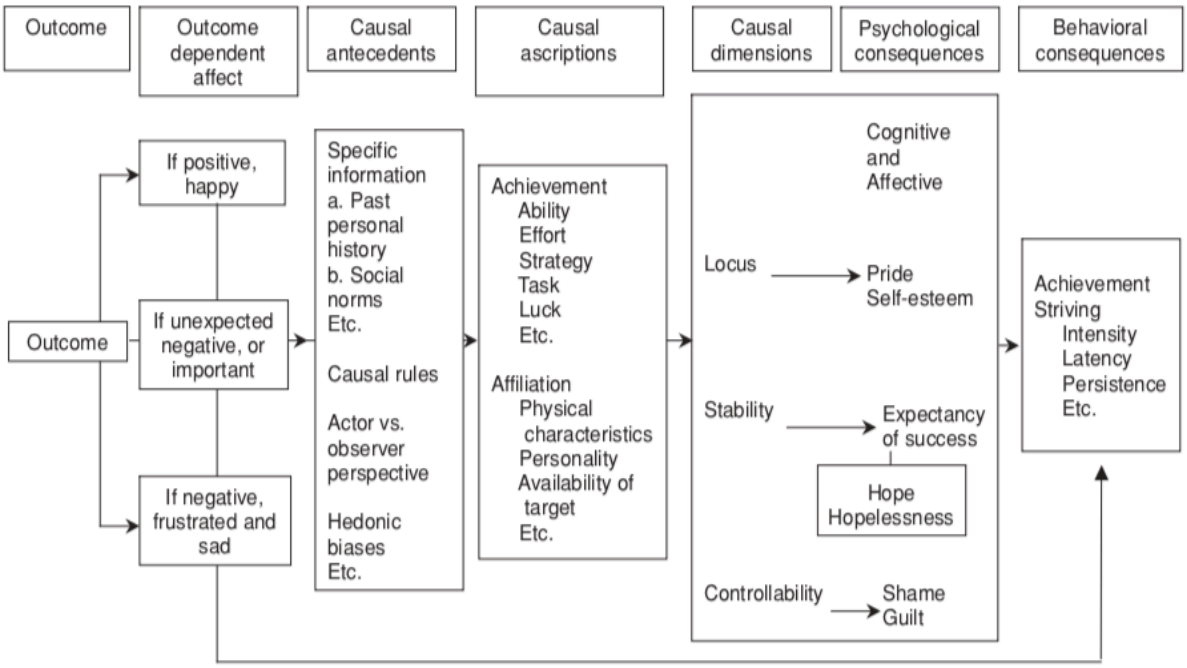

FIGURE 5 Final attribution-based theory of intrapersonal motivation.

Figure 1. Attribution theory. Adapted from "The development of an attribution-based theory of motivation: A history of ideas," by B. Weiner, 2010, *Educational Psychologist*, *45*(1), p.34. Copyright 2010 by American Psychological Association.

Attributional dimensions. Weiner (1985, 1995, 2002, 2006) proposed that any causal attribution could be classified according to three underlying dimensions: locus of causality, stability, and controllability. Locus of causality refers to internal factors within the individual (e.g., ability, effort) or external factors outside the individual (e.g., context, luck). If a student evaluates a lack of ability as a reason for their poor feedback from the teacher, he or she is understood as making an internal attribution. Stability distinguishes whether the cause of the event is temporal or permanent over time. For instance, a cause of something that is perceived persistent over time for students could be one's intelligence or teacher discrimination, whereas

Table 1

Sample Causal Attributions

Controllability	Stability: Stable factors	Stability: Unstable factors
	Locus of causality: Internal	
Personal (controllable)	Studying habits	Effort
External (uncontrolalble)	Ability, intelligence	Mood (fear, anxiety)
	External	
Personal (controllable)	Other's effort	Insufficient time
External (uncontrollable)	Difficulty of the task	Luck

Note. Adapted from "Causal attributions, causal dimensions, and affective reactions to success and failure," by D. Russell and E. McAuley, 1986, *Journal of Personality and Social Psychology*, *50*(6), p.1176. Copyright 1986 by American Psychological Association.

temporary causes could reflect effort, mood, or luck. Controllability refers to whether individuals believe the perceived cause can be managed or could have been prevented through factors under their personal control. For example, a student blaming low grades on bad luck could reflect an external, unstable, and personally uncontrollable causal attribution, whereas ascribing failure to low effort would typically represent an internal, unstable, and personally controllable attribution. Table 1 provides additional examples of causal attributions for failure experiences corresponding to each combination of the three causal dimensions proposed in Weiner's model.

In addition to attribution theory proposing a rather scientific perspective on how individuals ascertain the causes of their achievement experiences, researchers have found people to show systematic biases depending on who is experiencing the event, namely themselves or others. Fundamental attribution error in particular refers to individuals attributing positive outcomes to internal factors within themselves, while attributing negative outcomes to external factors so as to preserve their self-worth (Jellison & Green, 1981; Jones & Harris, 1967; Ross, 1997). However, when individuals are evaluating others, positive outcomes tend to be ascribed to

external factors (e.g., contextual features, opportunities) and negative outcomes experienced by other individuals to personal factors (e.g., personality characteristics). Such biases are explicitly incorporated into attribution theory as "causal antecedents" that influence attribution selection (see Figure 1) that nevertheless are proposed to have the same cognitive, emotional, and behavioural consequences as attributions that may be more accurate in nature.

In general, attribution theory emphasizes the importance of students' beliefs about the reasons for their academic experiences, beliefs that are proposed to have significant effects on students' emotions, academic behaviours (e.g., persistence, help-seeking), and performance outcomes (e.g., grade point average). If a student believes that he or she can not alter the cause of the negative academic outcomes, such uncontrollable attributions should interfere with their studying behaviours due to fear of failure (Harvey & Martinko, 2010). Previous literature has consistently shown students' causal attributions for academic failure to impact their learning and performance, with personally controllable attributions typically being beneficial (e.g., grades: Perry, Stupnisky, Hall, Chipperfield, & Weiner, 2010; Van overwalle & de Metsenaere, 1990; course withdrawal: Ruthig, Perry, Hall, & Hladkyj, 2004) and uncontrollable attributions proving detrimental for student development (e.g., low participation, Campbell, 1992; anxiety, Rozell & Gardner, 2000). Relatedly, an intervention referred to as Attributional Retraining (AR) has shown persistent performance gains by encouraging student to adopt personally controllable causal attributions for poor academic performance (e.g., insufficient effort, ineffective study strategies; Hall, Hladkyj, Perry, & Ruthig, 2004; Hall et al., 2007; Ruthig et al., 2004; Stewart et al., 2011). Students who receive Attributional Retraining (AR) report investing greater effort in their studies, withdrawing from fewer courses, and experiencing greater improvements in end-of-

year course performance relative to controls (for reviews, see Perry et al., 2010; Stewart et al., 2011).

Attribution-dependent emotions. Weiner (1985, 1986, 2000, 2010) also specifically emphasized the connection between causal attributions and emotions. In this respect, Russell and McAuley (1986) examined the effects of both causal attributions and dimensions on emotions. In their first study, both were found to be significant in understanding the types of emotions elicited in both academic success and failure situations. For example, when students made an internal attribution for poor achievement outcomes, they experienced more feelings of guilt (Russell & McAuley, 1986). As displayed in Figure 1, the three causal dimensions are each proposed to elicit specific affective experiences depending on the nature of the outcomes (e.g., positive/negative). More specifically, the locus of causality dimension is proposed to be directly connected with self-esteem, especially for positive outcomes. Internal attributions for positive outcomes thus should result in stronger feelings of self-worth and pride, whereas attributions for negative outcomes to internal factors (e.g., ability, effort) should reduce positive emotions and instead foster feelings of guilt (Neumann, 2000; Van Overwalle & de Metsenaere, 1990; Weiner, 1986). In contrast, the stability dimension is proposed to most directly impact feelings of hope, highlighting the relationship with expectancies for future success (Weiner, 1986, 2010). Conversely, people who perceive their failures as resulting from permanent factors (e.g., lack of ability, intelligence) are anticipated to report feelings of helplessness. Finally, individuals who attribute negative outcomes to personally controllable factors (e.g., lack of effort) are more likely to express emotions such as guilt and regret (Hall et al., 2004, 2007; Jackson, Hall, Rowe, & Daniels, 2009; Moreno-Jiménez, 1986; Struthers & Perry, 1996). Table 2 provides additional

Table 2

Sample Emotional States (Failure)

Locus of causality	Internal	External
	Guilt	Anger, Frustrated
Stability	Stable	Unstable
	Helplessness	Hope
Controllability	Controllable	Uncontrollable
	Guilt, Regret	Anger, Shame

examples of emotional states following failure outcomes corresponding to three causal dimensions.

Causal attributions and academic procrastination. The relationships between procrastination and constructs reflecting perception of personal controllability have been examined in higher education settings. Although not assessed based on Weiner's (1985) attribution theory, and instead adopting related paradigms (e.g., locus of control; Rotter, 1966), existing studies have consistently reported a negative relationship between perceptions of internal control and procrastination frequency (Carden, Byrant, & Moss, 2004; Janssen & Carton, 1999; Rothblum et al., 1986). Students who believed that they have control over their academic outcomes showed a lower tendency to needlessly delay their academic tasks. Heretofore, only a handful of studies have examined the relationship between procrastination and causal attributions as informed specifically by attribution theory (Gargari et al., 2011; Hoppe, 2011).

Gargari et al. (2011) found that undergraduate students who attributed their academic failure to internal and stable factors (e.g., low ability) were more likely to procrastinate, whereas students who credited their academic success to their own efforts showed a lower tendency to procrastinate on academic tasks. Moreover, over 17% of the variance in procrastination in this

study was explained by causal attributions for academic outcomes, highlighting the importance of examining relations between causal attributions and academic procrastination. Similar findings were observed in a study by Hoppe (2011) that showed students with high academic procrastination levels to also report more often attributing negative academic outcomes to internal and stable factors. In this study, Hoppe assessed undergraduate students' attributions by way of their explanatory styles, with a negative explanatory style indicating a tendency to make internal and stable attributions. Explanatory styles refer to patterns of causal attributions that individuals habitually report in response to positive or negative events, and are thus more trait-like and situation-general in nature. Although these preliminary findings are consistent with Weiner's (1985) attribution theory, more research is needed to further explore the relationship between procrastination and causal attributions in first-year undergraduate students, and specifically with respect to students' attributions for procrastination as well as their procrastination-related emotional experiences.

The Present Research

Although the prevalence and correlates of procrastination have been consistently empirically evaluated over the past 30 years, research on relationships between procrastination, causal attributions, and emotions in educational settings remains underexplored. Of the related studies conducted to date in this domain, only relations between student's causal attributions for achievement-related outcomes and procrastination behaviour have been explored (Gargari et al., 2011), leaving unanswered important questions about how students specifically attribute their procrastination behaviours and the emotional consequences thereof. The present study thus examined the relationships between first-year undergraduate students' procrastination frequency, causal attributions for procrastination, as well as positive and negative emotional experiences

specific to procrastination experiences. Based on the preceding literature review, three hypotheses were assessed in the present study.

Hypothesis 1: Procrastination and Causal Attributions

First-year students with high levels of procrastination were anticipated to attribute their procrastination behaviours primarily to internal and stable factors. This hypothesis was derived from existing findings that show higher levels of procrastination in university students to correspond with internal and stable attributions, especially for negative performance outcomes (Gargari et al., 2011). The present study thus similarly hypothesized similar findings for first-year university students' attributions for procrastination, based on procrastination being commonly identified by students as a negative, self-regulatory failure experience (Steel 2007).

Hypothesis 2: Procrastination, Attributions, and Positive Emotions

Direct effects of procrastination frequency on positive emotions were also anticipated based on previous research showing greater procrastination levels to generally correspond with lower levels of positive emotions such as hope (Alexander & Onwuegbuzie, 2007; Hypothesis 2a). However, although procrastination is commonly recognized as a negative phenomenon, some researchers propose that procrastination may produce positive outcomes (e.g., self-esteem, coping strategies, and academic performance; cf. active procrastination; for reviews, see Chu & Choi, 2005; Choi & Moran, 2009). Tice and Baumeister (1997) also suggest that procrastination could have short-term benefits for psychological well-being (e.g., low anxiety, stress).

Acknowledging this previous literature showing procrastination to have positive connotations for some individuals (Kim et al., 2017; Lee, 2013; Liu et al., 2017; Park & Sperling, 2012; Seo, 2012, 2013), it was further hypothesized that students who attributed their procrastination to temporally unstable and personally controllable factors would demonstrate

more positive emotions, such as hope and relief. First-year students who viewed procrastination on academic tasks as under their personal control or temporary in nature were expected to experience higher degrees of positive emotions by viewing their procrastination as under their control or changeable over time (Hypothesis 2b). Moreover, causal attributions were expected to mediate direct relations between procrastination and positive emotions for first-year students, such that if students perceived procrastination to be positive or beneficial (i.e., under their personal control, possibly improving on its own over time), an indirect effect between procrastination and positive emotions via attributions would also emerge as significant (Hypothesis 2c).

Hypothesis 3: Procrastination, Attributions, and Negative Emotions

Finally, higher levels of procrastination were hypothesized to directly correspond with stronger negative emotional experiences (Hypothesis 3a). This direct effect hypothesis follows from both the *underregulation* and *misregulation* hypotheses that propose procrastination to correspond with negative emotions due to self-regulation failure (e.g., negative emotions as consequences) or emotion regulation processes (negative emotions as antecedents; Balkis & Duru, 2016; Baumeister & Heatherton, 1996). First-year students who ascribed procrastination to internal factors (e.g., ability, effort) were further anticipated to experience greater negative affect (e.g., guilt; Neumann, 2000), with students who attributed procrastination to personally controllable factors (e.g., lack of effort) also expected to experience more negative emotions such as guilt and regret (Hall et al., 2004, 2007; Moreno-Jiménez, 1986; Jackson et al., 2009; Struthers & Perry, 1996; Hypothesis 3b). Moreover, internal and personally controllable attributions were expected to mediate the direct effects of procrastination on negative emotions (Hypothesis 3c), such that perceiving a sense of personal ownership (i.e., internal attributions,

such as to personality factors) or influence over one's academic procrastination (i.e., personally controllable attributions, such as lack of effort) may be responsible for the negative emotions elicited by procrastination.

Method

Participants

The study sample consisted of 429 first-year undergraduate students enrolled at McGill University. Demographic responses showed 73% of the students to identify as female, with participants' mean age being 18.83 years (*SD* = 2.77). The average high school GPA of participants was 89% (*SD* = 8.46), and the academic disciplines of participants were diverse, including Arts (36%), Science (23%), Engineering (11%), Agricultural and Environmental Sciences (9%), and Education (8%). Participants' ethnicities were predominantly Caucasian (58%), East Asian (15%), South Asian (5%), and West Asian (4%). Most participants indicated English (51%) or French (22%) as their first language, with 29.2% having graduated from Quebec CEGEP programs.

Procedure

In October of 2018, students were recruited via internal email in coordination with the McGill Campus Life and Engagement office (see Appendix C). All email recipients were validated as first-year students and reviewed an online study consent form (Appendix B) prior to study participation. The online system additionally required students to provide identifying information (e.g., name, institutional email address) and digital consent prior to participation, with participants able to withdraw the study at any time. Study participation consisted of completing an online questionnaire including demographic information (e.g., gender, age, discipline, high school grade) and study variables (e.g., procrastination, causal attributions,

emotions; see Appendix D) that required approximately 15-20 mins to complete. Participants who completed the study questionnaire were entered into five $50 cash prize draws. Ethics approval was provided by the McGill Research Ethics Board prior to data collection (see Appendix A).

Measures

The independent measure of procrastination frequency was measured as a unidimensional construct due to mixed results in the existing literature on subdividing academic procrastination into passive vs. active subtypes (e.g., see Chowdhury & Pychyl, 2018; Wolters et al., 2017). The mediational variables assessed included four causal dimensions specific to procrastination on academic tasks consisting of locus of causality (internal/external), temporal stability, personal controllability, and controllability by others (external control). The dependent measures included both positive and negative emotional experiences specific to academic procrastination behaviours. Descriptive information (means, standard deviations, and observed ranges) and internal reliabilities for the study variables are displayed in Table 3.

Procrastination frequency. An adapted version of Steel's (2010) Pure Procrastination Scale (PPS) was administered in which the scale preamble directed students to respond specifically in reference to their "first-year undergraduate experiences with procrastination on academic tasks." This scale reflected a unidimensional conceptualization of procrastination as a maladaptive behaviour enacted despite negative consequences, and consisted of 12 items (e.g., "I delay making decisions until it's too late"; "I find myself running out of time"). Participants responded to scale items on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*).

Procrastination attributions. An adapted version of McAuley, Duncan, and Russell's (1992) revised Causal Dimension Scale (CDSII) was used to assess first-year undergraduates'

perceived reasons for procrastination on academic tasks. The primary perceived causal attribution(s) for procrastination was first entered by students in an open-ended field, with that response subsequently rated by participants using an 8-item, 9-point measure with respect to (a) locus of causality (e.g., 9 = *inside of you* to 1 = *outside of you*), (b) stability (e.g., 9 = *permanent* to 1 = *temporary*), (c) personal control (e.g., 9 = *over which you have power* to 1 = *over which you have no power*), and (d) external control (e.g., 9 = *under the power of other people* to 1 = *not under the power of other people*).

Procrastination emotions. Multiple discrete positive and negative emotional experiences specific to procrastination were assessed using an 11-item, 5-point measure (1 = *not at all* to 5 = *very strong*) based on Weiner's (2010) attribution theory (for previous administrations of this measure specific to academic performance, see Hall et al., 2004, 2007). All the emotions were specified in Weiner's model as explicitly dependent on specific attributional dimensions (e.g., internal attributions → pride; unstable attributions → hope), with scale items consisting of both positive emotions (4 items; *surprise, pride, hope, relief*) and negative emotions (7 items; *guilt, shame, regret, anger at yourself/others, helplessness, apathy*) pertaining directly to "procrastinating on an academic task."

Table 3

Descriptive Statistics for Study Measures

Scale	Observed range	*M*	*SD*	α/*r*
Procrastination	1.08-5.00	3.06	0.81	.88
Causal dimensions				
Locus of causality	2-9	6.86	1.60	.47
Stability	1-9	4.08	1.71	.36
Personal control	1-9	6.80	1.60	.57
External control	1-9	3.94	1.98	.58
Positive emotions	1-5	1.83	0.81	.67
Surprise	1-5	1.96	0.91	
Pride	1-5	1.55	0.94	
Hope	1-5	2.24	1.06	
Relief	1-5	1.70	1.08	
Negative emotions	1.1-4.7	3.04	0.74	.76
Guilt	1-5	3.69	1.12	
Shame	1-5	3.11	1.30	
Regret	1-5	3.93	1.06	
Anger at yourself	1-5	3.59	1.19	
Anger at others	1-5	1.66	0.98	
Helplessness	1-5	2.94	1.24	
Apathy	1-5	2.36	1.18	

Note. As the four causal dimensions were each calculated using two self-report items, internal reliability for these measures was estimated by zero-order, inter-item correlations (*r*); Higher scores in the locus of causality indicated internal attributions, while lower scores represented external attributions.

Results

Preliminary Analyses

Statistical assumptions. Critical statistical assumptions (normality, homogeneity, univariate/multivariate outliers) were evaluated prior to the main analyses of the present study. The univariate normality was assessed using standardized scores of skewness and kurtosis, with violation cutoff scores of 3.2 and 8 respectively (Tabachnick & Fidell, 2007). All four measures of causal dimensions violated the skewness assumption such that locus and personal control were negatively skewed, whereas external control and stability were positively skewed. All remaining variables satisfied the normality assumption. Nevertheless, as residual errors for all variables were normally distributed, the causal dimension measures were not transformed prior to analysis.

Homogeneity was examined using the scatterplot of regression standardized predicted values by regression standardized residuals. Inspection of the scatterplot showed values to be randomly distributed around the line of zero, indicating that residual variances were constant (Meyers, Gamst, & Guarino, 2016). Univariate outliers were additionally examined using the boxplot that showed no extreme outliers beyond the range of |3| standard deviation across the study variables. Although the mahalanobis distance test for multivariate outliers showed 15 multivariate outliers to exceed the critical value of chi-square statistics ($\alpha = .01$), outliers were not removed as they were notably infrequent (3.3% of responses) and the values observed were not extreme (Cohen, Cohen, West, & Aiken, 2003).

Initial differences. Independent-samples *t*-tests and one-way ANOVAs conducted on all study variables showed significant differences as a function of first language and international status. Students who spoke a first language other than English or French reported higher scores on both personal control ($F(10, 385) = 2.24$, $p = .015$) and positive emotions ($F(10, 366) = 1.94$,

p = .039), however the effect size of these differences was not large (personal control η2 = 0.05, positive emotions η2 = 0.05). Non-international students also reported a greater perceived control than international students; $t(393) = -3.82$, $p < .001$, $r^2 = 0.04$. As a chi-square analysis (English vs other languages; international vs. non-international) showed that international student status was not redundant with first language classification ($\chi^2 = .857$, $df = 1$, $p = .355$), both variables were controlled for in the main analysis to minimize their potential confounding effects. Although there were no significant differences in the study variables as a function of age (zero-order correlations) or gender (t-test), both were included as covariates based on previous studies consistently showing age and gender differences in procrastination (Beswick et al., 1988; Rothblum et al., 1986; Solomon & Rothblum, 1984; Schouwenburg, 2004; Steel, 2007).

Correlational analyses. Correlations between the main study variables are presented in Table 4 and showed interesting results between procrastination and locus of causality as well as personal control. Despite locus of causality and personal control showing a positive relationship, procrastination was positively correlated with an internal locus but negatively correlated with personal control. Thus, although previous studies have shown multicollinearity between the locus of causality and personal control dimensions of the CDSII (i.e., due to personal controllability being nested within internality; e.g., Hall, 2018; Wang, Hall, & Rahimi, 2015), no multicollinearity concerning this measure was observed in the present study. A significant negative correlation was also found between the stability dimension and personal control, with positive correlations otherwise found between the causal dimensions. Not surprisingly, procrastination was positively associated with negative emotional experiences. However, correlations between positive emotions and negative emotions, and between positive emotions and procrastination, were not significant.

Table 4

Zero-order Correlations among Study Variables

	1	2	3	4	5	6	7
1. Procrastination	_						
2. Locus of causality	.18**	_					
3. Stability	.27**	.11*	_				
4. Personal control	-.23**	.19**	-.36**	_			
5. External control	.05	-.28**	.15**	-.09	_		
6. Positive emotions	.04	-.07	.06	-.02	.11*	_	
7. Negative emotions	.36**	.15**	.17*	-.09	.09	-.08	_

Note. *$p < .05$, ** $p < .001$.

Measurement models. The utility of a structural equation model is highly contingent upon the underlying measurement model consisting of the latent construct and indicator variables (Byrne, 2010; Hair, Black, Babin, & Anderson, 2010). The measurement model can be evaluated using either exploratory factor analysis (EFA) or confirmatory factor analysis (CFA). Although EFA is not sufficient to provide information on latent constructs, extraction and rotation methods can be beneficial for determining an ideal number of factors and reducing items, particularly for new self-reports as assessed in the present study (procrastination-specific attributions and emotions).

Procrastination frequency. The reliability and validity of Steel's (2010) Pure Procrastination Scale (PPS) have been validated in recent studies by way of confirmatory factor analysis (CFA; Svartdal et al., 2016: CFI = .866, RMSEA = .113). In the present study, the fit for a CFA evaluating the PPS as a single factor demonstrated was consistent with previous literature: $\chi^2 = 369.154$, $df = 50$. $p < .001$, CFI = .828, RMSEA = .122. Four error variances between items were correlated based on the results of modification indices (MI). For example, residuals for procrastination items 9 ("I find myself running out of time") and 10 ("I don't get things done on time") were correlated, likely to shared wordings concerning time. All standardized loadings of the observed variables on the latent construct were acceptable (> .30) and are presented in Figure 2.

Procrastination attributions. The revised version of McAuley at al.'s (1992) CDSII administered in this study assessed four causal dimensions underlying students' attributions for their procrastination behaviour: locus of causality, stability, personal control, and external control. A four-factor model CFA with correlations between the latent factors showed satisfactory model fit: $\chi^2 = 36.620$, $df = 14$. $p < .001$, CFI = .963, RMSEA = .061. Moreover, the

standardized factor loadings on each latent variable were above .6, with the exception of one indicator variables for stability (factor loading = .495; see Table 5).

Procrastination emotions. The 11 discrete emotions items were assessed to determine empirical support for evaluating emotions according to reduced dimensions based on valence as in previous research (positive vs. negative attribution-dependent emotions; see Hall et al., 2007). The exploratory factor analysis using maximum likelihood factor extraction and Varimax with Kaiser Normalization rotation revealed two factors that each exceeded Eigenvalue > 1 (see Table 6). The results supported the analysis of composite variables reflecting positive versus negative affective experiences concerning procrastination. Follow-up CFA results demonstrated a better fit for the two-factor model (e.g., positive and negative) as compared to a single-factor model, with the removal of three low loadings items (i.e., surprise, anger at others, and apathy) further improving model fit; $\chi^2 = 77.013$, $df = 19$, $p < .001$, CFI = .931, RMSEA = .084 (see Table 7). Based on these preliminary findings, the main analyses assess two measures of positive versus negative emotions concerning procrastination consisting of three and five items, respectively (for item loadings, see Table 8).

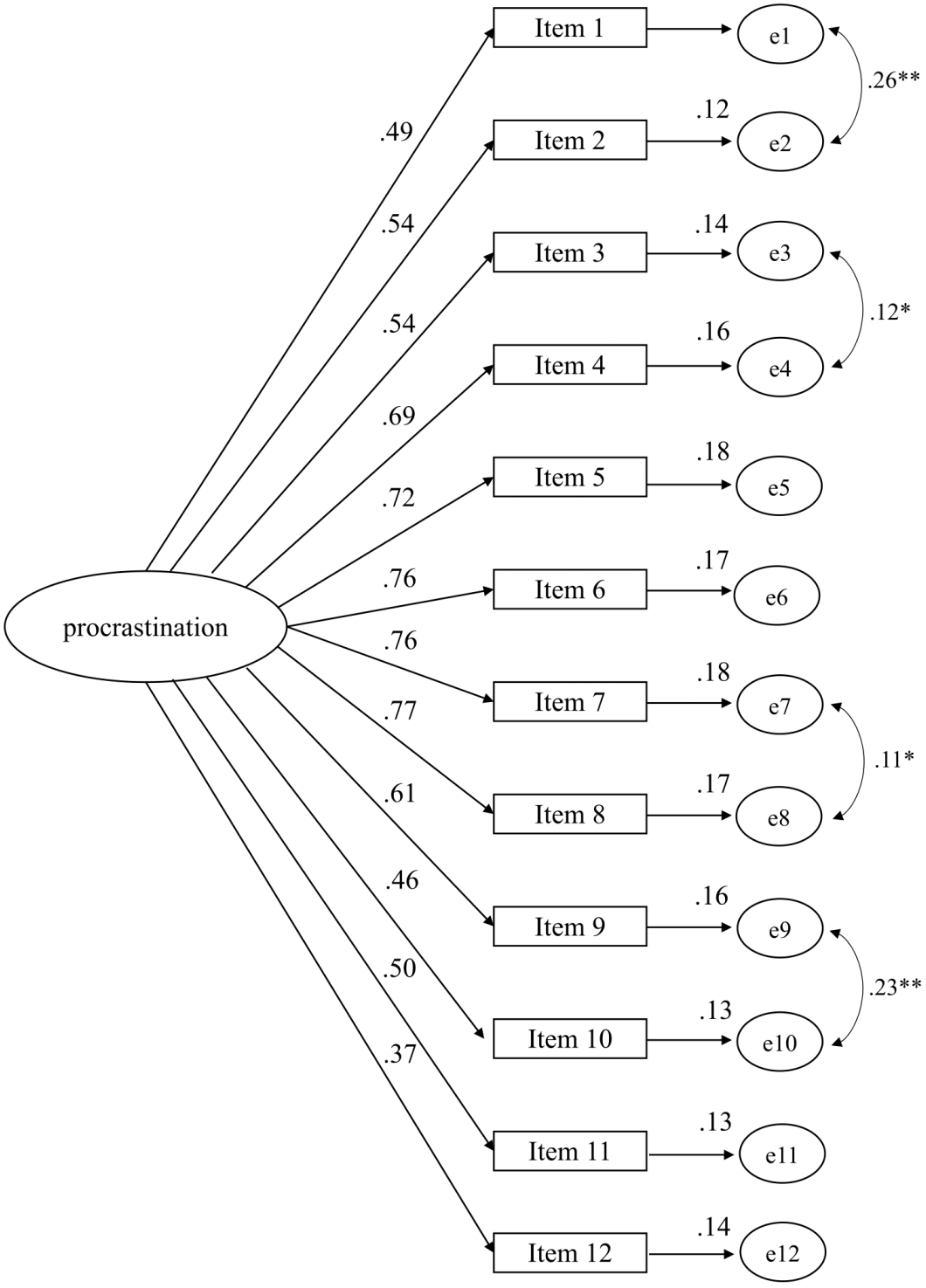

Figure 2. CFA results for procrastination; all the standardized loadings are significant at $p < .001$. *$p < .05$, **$p < .001$. Missing data were automatically estimated using maximum likelihood method.

Table 5

CFA Results for Procrastination Attributions

Observed variable	Latent construct	*β*	*B*	*SE*
Item 6	Locus of causality	.636	1.000	
Item 8		.731	0.921**	.144
Item 3	Stability	.495	1.000	
Item 10		.721	1.513**	.255
Item 2	Personal control	.667	1.000	
Item 9		.855	1.419**	.174
Item 5	External control	.780	1.000	
Item 11		.740	0.906**	.140

Note. **$p < .001$; CFA = Confirmatory factor analysis; missing data were automatically computed using maximum likelihood estimation method.

Table 6

EFA Results for Procrastination Emotions

	Factor loading	
Item	1	2
Factor 1: Positive emotions		
2. Surprise	.37	.16
4. Pride	.76	-.13
6. Hope	.44	-.11
9. Relief	.78	-.06
Factor 2: Negative emotions		
1. Guilt	.04	.67
3. Shame	.06	.73
5. Regret	-.07	.68
7. Anger (at yourself)	.04	.78
8. Anger (at others)	.42	.21
10. Helplessness	.08	.57
11. Apathy	.29	.22

Note. Extraction method: Maximum likelihood; 2 factors were extracted, Rotation method: Varimax with Kaiser Normalization.

Table 7

Competing CFA Models for Procrastination Emotions

Model	χ^2	*df*	χ^2/df	CFI	RMSEA
Single-factor model	410.867	42	9.783	.634	.143
Two factors (11 items)	212.931	43	4.952	.831	.096
Two factors (8 items)	77.013	19	4.053	.931	.084

Note. CFA = Confirmatory factor analysis; missing data were automatically estimated using maximum likelihood method.

Table 8

Final CFA Results for Procrastination Emotions

Observed variable	Latent construct	*β*	*B*	*SE*
Pride	Positive	.831	1.000	
Hope	Positive	.455	0.616**	.092
Relief	Positive	.710	0.978**	.131
Guilt	Negative	.677	1.000	
Shame	Negative	.732	1.248**	.107
Regret	Negative	.659	0.916**	.085
Anger at yourself	Negative	.779	1.217**	.100
Helplessness	Negative	.558	0.907**	.097

Note. **$p < .001$; CFA = Confirmatory factor analysis; missing data were automatically estimated using maximum likelihood method.

Main Analyses

Informed by Weiner's (1985) attribution theory, the study's research questions were examined using mediational structural equation modelling (SEM) of the proposed relationships between procrastination (independent variable), causal attributions (mediators), and positive/negative emotions (dependent variables). Based on the preliminary analyses, four covariates were additionally included to minimize confounding effects by controlling for critical demographic variables (e.g., age, gender, first language, international status). SEM analyses were conducted utilizing Amos 21.0 software with maximum likelihood estimation method used to

estimate missing values (Byrne, 2010, 2016). The SPSS PROCESS MACRO with a bootstrapping sample of 5000 and the confidence level of .95 (Hayes, 2013) was conducted to evaluate the significance of the observed indirect effects of procrastination frequency on emotions as mediated by attributions.[1]

To examine model fit, the indices evaluated included chi-square ($\chi 2$), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). Both direct and indirect effects were assessed by contrasting the independent and saturated models. The structural model also controlled for the four covariates by including both direct paths to independent variables and modeling covariances between the covariates. Residual errors between the mediators and among the dependent measures were also correlated to model the observed zero-order covariance (see Table 4). Based on the modification indices of the measurement model of procrastination, four residuals for the procrastination items were continually intercorrelated in the main analyses. Concerning the magnitudes of the latent covariances in the SEM analysis, despite a weak preliminary zero-order correlation between locus of causality and personal control, the latent covariance between these variables was moderate in magnitude (.40, $p < .001$). All other covariances between the latent mediators and among the dependent variables were further examined as the preliminary zero-order correlation between stability and other causal dimensions were found to be significant. The covariance magnitudes were moderate in magnitude (i.e., external control and stability: .25, $p = .005$; personal control and stability: -.58, $p < .001$) and thus do not suggest potential confounds due to multicollinearity.

[1] Due to minimal differences between the model with four covariates and with no covariates, the PROCESS MACRO mediation was conducted without including four covariates for the sake of parsimony. The fit indices of the final SEM model that did not include four covariates was $\chi^2 = 888.692$, $df = 329$, $p < .001$, CFI = .841, RMSEA = .061.

The final SEM model assessed demonstrated satisfactory fit: $\chi^2 = 958.196$, $df = 409$, $p < .001$, CFI = .847, RMSEA = .056. All standardized parameter values are displayed in Figure 3. Findings showed procrastination to emerge as a direct significant predictor of negative emotional experiences ($\beta = .28$, $p < .001$). However, results also showed first-year students who more frequently procrastinated on academic tasks to also more strongly attribute their procrastination to causes that were internal to themselves ($\beta = .28$, $p < .001$) and stable over time ($\beta = .35$, $p < .001$), and to avoid personally controllable attributions ($\beta = -.22$, $p < .001$). Students who more strongly attributed their procrastination to internal factors, in turn, reported more negative emotions ($\beta = .29$, $p = .050$). Procrastination did not significantly predict positive emotions, either directly or indirectly, and also did not significantly predict attributions to external factors under the control of others. Students who more strongly attributed their procrastination to factors under the control of others were nevertheless found to report higher levels of negative emotions ($\beta = .24$, $p = .031$). Supplemental bootstrapping analyses showed the marginal indirect effect of procrastination frequency on negative emotions via locus of causality to be statistically significant ($\beta = .03$, $SE = .013$, CI = .0016-.0494).

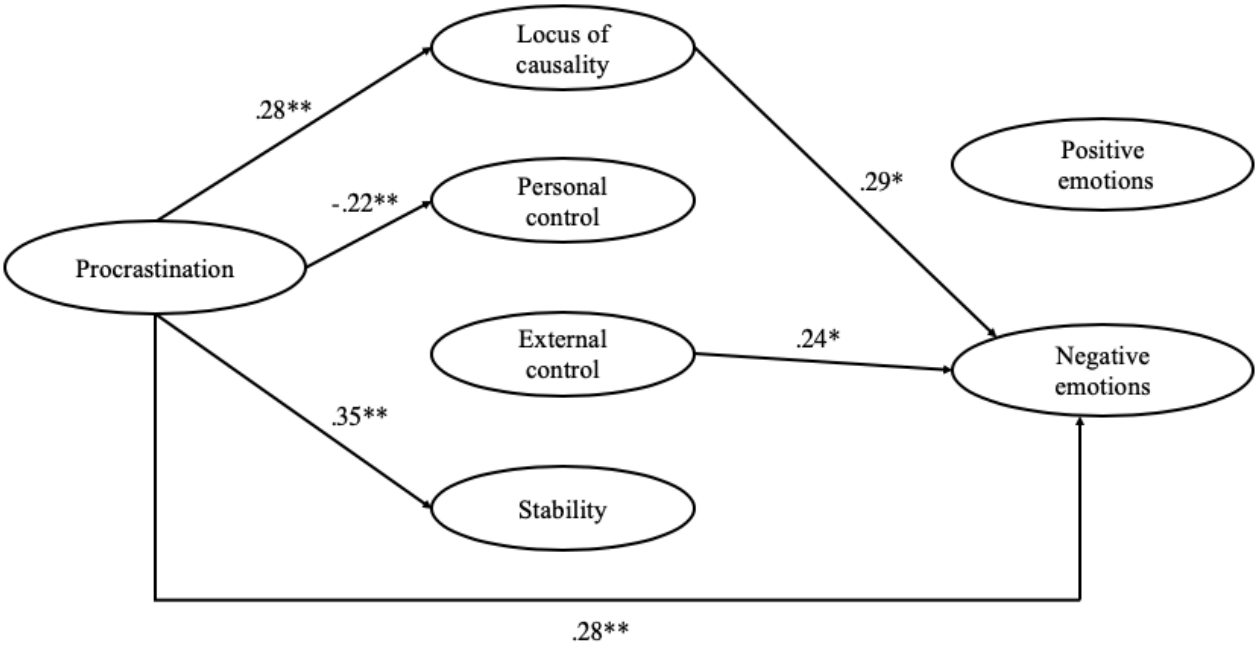

Figure 3. Structural equation model of hypothesized relations between procrastination frequency, attributions, and emotions; Standardized estimates are displayed; * $p < .05$, ** $p < .001$.

Discussion

First-year undergraduate students typically encounter both personal and academic difficulties upon entering higher education, with university experiences often differing substantially from high school with respect to requirements for personal autonomy and initiative (Perry et al., 2001). In other words, undergraduates are expected from the outset to be responsible for their own academic-related behaviours such as studying complex content, meeting course deadlines, and deciding on a program of study or career. In this context, procrastination is a common behaviour among university students who frequently voluntarily delay their academic tasks (e.g., writing a term paper, studying for exams) despite anticipating the negative consequences thereof (Rothblum at al., 1986; Steel, 2007). First-year students are

particularly susceptible to procrastination due to overestimating their capabilities (Thibodeaux et al., 2017) as well as difficulties with time management (Cerrito & Levi, 1999; Zuriff, 2003) and self-regulated learning (e.g., cognitive and meta-cognitive strategies, adaptive motivational beliefs; Howell & Watson, 2007; Tan et al., 2008; Wolters, 2003). Whereas existing research has examined the correlates of academic procrastination, students' own perspectives on the causes of their procrastination remain underexplored. To address this research gap, this study applied Weiner's (1985) attribution theory to understand first-year students' causal explanations for their procrastination and corresponding relations with both positive and negative emotions specific to procrastination. The overall study results provided empirical support for hypothesized relationships between procrastination, attributions, and emotions as outlined below.

Hypothesis 1: Procrastination and Causal Attributions

The first hypothesis proposed that first-year university students who showed higher degrees of procrastination should more strongly attribute their procrastination to internal and stable factors. As anticipated, higher academic procrastination frequency corresponded with more attributions to factors internal to the student (versus external) and factors that were unlikely to change over time. Analysis of qualitative responses to the open-ended CDSII item concerning the primary cause of academic procrastination as perceived by students showed sample internal attributions to include fear, anxiety, depression, and ADHD, and sample stable attributions to include persistent online distractions (e.g., Netflix, Facebook), language difficulty, workload, and mental health difficulties. These findings are thus consistent with prior research showing performance attributions to internal and stable factors to correspond with greater academic procrastination levels (Gargari et al., 2011; Hoppe, 2011) and provides clear empirical support for Hypothesis 1.

However, an additional unexpected finding showed students who procrastinated more to be less likely to attribute their procrastination on academic tasks to personally controllable factors. Analysis of qualitative responses showed such personally controllable attributions to involve factors such as ADHD, anxiety, depression, and lack of motivation. Contrasting the opposite findings for internal attributions, this result suggests that whereas higher procrastination was positively associated with internal attributions that were primarily *uncontrollable* in nature (e.g., learning disabilities, mental health issues, and personality factors), it was negatively associated with internal attributions to personally controllable variables (e.g., persistence, effort). As a potential explanation for this latter finding, it is possible that due to the present sample having been recruited from a top research-intensive university in Canada with highly competitive admission requirements (i.e., average high school grades over 93% for Fall 2018 undergraduate admissions), first-year students may not question the considerable effort invested to secure their admission and instead begin to doubt their abilities in this novel academic setting. Given that more than one third of first-year students in the United States reported challenges in adjusting to high academic standards in higher education settings (Higher Education Research Institute, 2014), these students would not be alone in questioning their abilities during their first year of post-secondary education (for a review of related findings for Canadian first-year students, see Perry et al., 2010).

Hypothesis 2: Procrastination, Attributions, and Positive Emotions

According to the second hypothesis, mixed effects of procrastination on positive emotions were expected including a direct negative effect (Hypothesis 2a) and potential indirect positive effects for first-year students who attributed procrastination to unstable or personally controllable reasons (attribution effect: Hypothesis 2b; mediation effect: Hypothesis 2c).

Contrary to each hypothesis, there were no direct or indirect effects observed on positive emotions (i.e., hope, pride, relief) from either procrastination or causal attributions in this study. These findings are thus contrary to previous findings showing procrastination to correspond with lower levels of positive emotions (e.g., feelings of hope; Alexander & Onwuegbuzie, 2007), as well as emerging perspectives on active procrastination being accompanied with high self-efficacy (e.g., perceived controllability) and positive outcomes (e.g., time management, academic performance; Choi & Moran, 2009; Chu & Choi, 2005). Nevertheless, these findings contribute to previous research on both typical procrastination and active procrastination by suggesting that although the benefits of active procrastination may be observed with respect to academic achievement outcomes (e.g., grade point average), they are unlikely to be observed on emotion-related variables.

Hypothesis 3: Procrastination, Attributions, and Negative Emotions

The third study hypothesis anticipated a strong direct effect between procrastination and negative emotions based on previous findings showing procrastination to result in students experiencing more negative emotions (Hypothesis 3a; e.g., shame: Fee & Tangney, 2000; guilt: Pychyl et al., 2000; Schraw et al, 2007). It was further hypothesized that first-year students who attributed procrastination to internal attributions generally, or personally controllable factors more specifically, would experience stronger negative emotions (Hypothesis 3b; e.g., guilt: Moreno-Jiménez, 1986; Neumann, 2000; regret: Ferrari et al., 2009; Kuhnle, Hofer, & Kilian, 2011), with these attributional dimensions potentially mediating the effects of procrastination on negative emotions (Hypothesis 3c). A significant direct effect supported Hypothesis 3a in showing first-year students who reported higher levels of procrastination to also report higher levels of negative emotions concerning their procrastination (i.e., guilt, shame, regret, anger,

helplessness). Moreover, the more students attributed their academic procrastination to reasons within themselves (internal locus), they were more likely to experience negative emotions. This finding thus partially supports Hypothesis 3b in that although the path between personal control and negative emotions was not significant, internal attributions did correspond with more negative emotions concerning procrastination. Moreover, this finding is consistent with the fundamental attribution error that proposes attributions to external factors to mitigate negative emotional reactions to personal failure experiences (Jellison & Green, 1981; Ross, 1977). Concerning the proposed indirect effects (Hypothesis 3c), although procrastination did positively correspond with internal attributions that, in turn, predicted negative emotions, the effect size for this indirect effect was negligible suggesting that this causal dimension was not a particularly strong mediator. Thus, whereas previous literature has suggested a strong relationship between internal attributions and negative emotions concerning achievement outcomes (e.g., guilt; Neumann, 2000), only a marginal indirect effect was observed when instead evaluating academic procrastination as the outcome of interest. As no mediation effect was detected with regard to personal control, the third hypothesis was only partially supported by the present data.

An unanticipated finding was also observed showing students who attributed procrastination to reasons that were under control of others to correspond with higher levels of negative emotions. Inspection of qualitative findings showed such attributions to external control by others to refer to factors such as socialization and social media (e.g., Facebook, Internet). Although this finding contradicts the concept of fundamental attribution error (i.e., external attributions preserving self-worth; Jellison & Green, 1981; Ross, 1977), it is directly consistent with Weiner's (1985) theory in which attributions for failure to the controllable actions of others is proposed to result in specific negative emotions (i.e., anger; see Table 2). This finding also

extends upon procrastination research in that although blaming others for one's needless delay may help students justify their procrastination (Knaus, 2000b) and maintain a positive view of themselves (Kernis, Grannemann, & Barclay, 1992), it can nevertheless contribute to higher levels of negative emotions concerning their procrastination, such as helplessness (see Knaus, 2000a; Seligman, 1975).

Limitations and Future Directions

When interpreting the present study results, it is important to note that specific limitations that may limit generalizability. One such study limitation relates to the self-report study measures employed. Although the qualitative, open-ended component of the attribution measure implied that moods and learning disabilities (e.g., ADHD) were perceived as internal to students themselves, further quantitative interviewing would be needed to ascertain if students perceived themselves as personally responsible for these factors. As it is additionally possible that students' socialization experiences and ethnic background could have shaped the types of attributions used to explain procrastination experiences (e.g., parental support, Won & Yu, 2018; cross-cultural differences, Klassen et al., 2009; Mann et al., 1998), future qualitative studies are also required to better clarify the potential causes for students' perceived reasons for their procrastination.

Prior research further suggests that retrospective self-report measures of emotional experiences may also lead respondents to overrate both positive and negative emotions (Mill, Realo, & Allik, 2015; Thomas & Diener, 1990; Parkinson, Briner, Reynolds, & Totterdell, 1995). The present study also exclusively employed self-report measures of procrastination and causal attributions that are also susceptible to social desirability bias (Edwards, 1953). Accordingly, first-year students may have underreported their procrastination behaviours on academic tasks to appear more favorable to the researchers. Although procrastination has been mostly examined

using self-report measures (e.g., PPS, Steel, 2010; PASS, Solomon & Rothblum, 1984), behavioral observations (cf. how many hours or days students delayed submitting their assignments; Wang & Englander, 2010) using longitudinal methods could provide a better understanding about the cognitive, affective, and behavioural components of procrastination (Moon & Illingworth, 2005; Tice & Baumeister, 1997). Similarly, future studies measuring moment-to-moment or state assessments could help to provide a more ecologically valid, real-time perspective on relations between students' procrastination, attributions, and emotions (cf. experience sampling assessments of students' learning-related emotions; Goetz, Bieg, & Hall, 2016).

Furthermore, due to the cross-sectional research design of the study, it is possible that alternative directional or reciprocal relationships between study variables may exist (Spada, Hiou, & Nikcevic, 2006). Although our study hypotheses and analytical model was grounded on the intrapersonal attribution theory (Weiner, 1985) that proposes a sequential pattern in which a negative event (e.g., procrastination as self-regulation failure) is followed by causal search resulting in attributions with underlying dimensions and corresponding emotions, future studies should adopt longitudinal research designs in which these assumed directional relations are directly tested (e.g., cross-lagged SEM analyses). Finally, although our study sample consisted exclusively of first-year undergraduate students, due to the specific challenges faced in adapting to an unfamiliar university setting assumed to elicit procrastination behaviour (Bembenutty, 2009; Thibodeaux et al., 2017), future studies with more advanced undergraduates or graduate students is recommended. As procrastination on academic tasks could change over time to becoming accustomed to college life, or cumulative success or failure experiences, with existing findings

on procrastination in graduate student samples being particularly lacking (cf. Cao, 2012a; Onwuegbuzie, 2004; Onwuegbuzie & Collins, 2001).

Concerning the implications of the present study, university faculty and advisors should be advised to discourage students from making attributions for procrastination to factors that are under the control of others, or internal factors that the students themselves cannot control, or do their best to not implicitly convey these messages to students due to their potential negative effects on student's emotional well-being. This finding is consistent with Rahimi, Hall, and Pychyl (2016) who showed that although students believe others are less morally responsible when their procrastination does not result in failure, they nevertheless feel equally responsible for their own procrastination regardless of the outcome. Moreover, our findings expand upon these results in showing this focus on personal responsibility for one's own procrastination to additionally negatively impact their emotions, thus underscoring the importance of providing appropriate feedback to students concerning their procrastination so as to mitigate possible negative effects on both their cognitions and emotional well-being.

Conclusion

The main purpose of the present study was to examine the perceived reasons for procrastination among first-year undergraduate students so as to better inform future efforts to examine and reduce this maladaptive behaviour. Procrastination is a frequent self-regulation failure experience faced by many university students (Balkis & Duru, 2007), with most students identifying it a serious problem that negatively affects their academic performance (Klassen et al., 2010; Pychyl, 2013). The present findings contribute to existing academic procrastination research in showing greater procrastination in first-year students to correspond with stronger attributions for procrastination to internal factors beyond their personal control (e.g., learning

disabilities, depression, anxiety) as well factors that are stable over time (e.g., intelligence, task difficulty). Students who attributed procrastination to internal factors further tended to experience more unpleasant emotions concerning their procrastination, with procrastination frequency and attributions to the controllable behaviour of others also having direct detrimental relationships with students' negative emotions. The present findings further support possible procrastination interventions that discourage internal attributions as well as blaming others for procrastination behaviours given their observed negative impact on students' emotional well-being. Overall, these results demonstrate the importance to future longitudinal and qualitative research on how students' perceptions concerning their procrastination impact their emotional experiences and could help to inform institutional orientation programs to address maladaptive beliefs about procrastination for first-year students.

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Appendix A

Ethics Documentation

McGill

Research Ethics Board Office
James Administration Bldg.
845 Sherbrooke Street West. Rm 325
Montreal, QC H3A 0G4

Tel: (514) 398-6831

Website: www.mcgill.ca/research/researchers/compliance/human/

Research Ethics Board II
Certificate of Ethical Acceptability of Research Involving Humans

REB File #: 513-0518

Project Title: Potential Antecedent and Effects of Academic Procrastination: A First-Year Perspective

Principal Investigator: So Yeon Lee

Department: Educational and Counselling Psychology

Status: Master's Student

Supervisor: Prof. Nathan C. Hall

Funding: SSHRC (PI Prof. N. C. Hall)

Approval Period: July 23, 2018 to July 22, 2019

The REB-II reviewed and approved this project by delegated review in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Deanna Collin
Senior Ethics Review Administrator

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* Approval is granted only for the research and purposes described.
* Modifications to the approved research must be reviewed and approved by the REB before they can be implemented.
* A Request for Renewal form must be submitted before the above expiry date. Research cannot be conducted without a current ethics approval. Submit 2-3 weeks ahead of the expiry date.
* When a project has been completed or terminated, a Study Closure form must be submitted.
* Unanticipated issues that may increase the risk level to participants or that may have other ethical implications must be promptly reported to the REB. Serious adverse events experienced by a participant in conjunction with the research must be reported to the REB without delay.
* The REB must be promptly notified of any new information that may affect the welfare or consent of participants.
* The REB must be notified of any suspension or cancellation imposed by a funding agency or regulatory body that is related to this study.
* The REB must be notified of any findings that may have ethical implications or may affect the decision of the REB.

Appendix B

Online Consent Form

You are being asked to participate in a research study. Participation is completely voluntary. Please read the information below and ask questions about anything that you do not understand before deciding if you want to participate. A researcher listed below will be available to answer your question.

TITLE OF THE STUDY

First-Year Undergraduate Study Understanding Academic Procrastination

RESEARCH TEAM

So Yeon Lee (McGill University) so.yeon.lee@mail.mcgill.ca

Dr. Nathan C. Hall (McGill University) nathan.c.hall@mail.mcgill.ca

FUNDING

SSHRC Insight Grant 425-2013-1099

PURPOSE OF THE STUDY

The main purpose of the study is to learn about first-year undergraduate students' academic procrastination and time management behaviours.

ELIGIBLE SUBJECTS

First-year undergraduate students enrolled at McGill University (18 years of age or older, fluent in English) are eligible to participate in this study. Due to the achievement-oriented nature of this study, only students who consent to release their grades/program information to the experimenter from the Registrar's Office are eligible to participate. Participants' information to be provided by the Registrar's Office will include sessional GPA, credit hours completed, the program of study and major field, and CEGEP background. Consent to participate is provided by clicking the button below.

PROCEDURES

This study is completed entirely over the Internet (www.surveymonkey.com) and consists of a questionnaire regarding your experiences with procrastination and time management during the Fall 2018 semester. The questionnaire should take approximately 20-25 minutes to complete.

COMPENSATION, COSTS AND REIMBURSEMENT

Students participating in the study will be entered into a one-time draw for one of five $50 cash prizes. The anticipated odds of winning are 1 in 100.

CONFIDENTIALITY

Subject Identifiable Data:

Information will be collected through SurveyMonkey and transferred to an encrypted file online. To view SurveyMonkey's privacy policy, please refer to the link (https://www.surveymonkey.com/mp/policy/privacy-policy/). All identifiable information that will be collected about you will be removed at the end of the data collection (estimated: March, 2019). Identifying information will only be used to link your study responses with the registrar data and will be omitted immediately thereafter to ensure participant anonymity. No identifiable information about participants will be included in the study report.

Data Storage:

All research data will be stored electronically on a secure computer with password protection.

Data Access:

Only the research team (So Yeon Lee, Dr. Nathan C. Hall) will have access to your study records. Any information derived from this research that personally identifies will not be voluntarily disclosed by the research team without your separate consent, except as specifically required by law.

Data retention:

The researchers intend to keep the research data in an electronic format for at least 7 years.

Dissemination of results:

The results of this study will be presented as part of a Master’s thesis and at international conferences in Spring 2019. Moreover, the results will be presented in a manuscript to be submitted to an open-access publication in educational psychology in Fall 2019. All results will be presented at the group level with identifying information removed prior to the analysis.

RISKS AND DISCOMFORTS

There are risks involved in all research studies. This study is expected to include only minimal risks, with no known harms or discomforts associated with this study beyond those encountered in everyday life. A possible risk of participation in this study is mild anxiety and/or guilt that might be associated with recalling procrastination on academic tasks and reflecting on time management behaviours.

POTENTIAL BENEFITS

It is anticipated that study findings will inform existing first-year orientation programs and advance intervention programs aimed at improving effective time use.

VOLUNTARY PARTICIPATION STATEMENT

Your participation in this study is voluntary. You may choose to refuse to answer any question or may withdraw from the survey at any time. You also have the right to withdraw from the study prior to March 2019. A decision to withdraw from the study will not affect your future relationship with McGill University.

QUESTIONS?

If you have any questions or concerns regarding the conduct of this research, please contact the researchers listed above via email. If you have any ethical questions or concerns about your rights or welfare as a participant in this research study, please contact the McGill Ethics Manager at 514-398-6831 or lynda.mcneil@mcgill.ca.

PARTICIPANT CONSENT

I have read the above information and indicate my agreement to participate in this study by entering the identifying information below and clicking "next".

Institutional Email Address: _____
First Name: _____ Last name: _____

Please feel free to copy/print/download the consent information above for your records.

Appendix C

Recruitment Email

Email sent by McGill Campus Life and Engagement

Hello!

This message is sent to you on behalf of So Yeon Lee and Dr. Nathan C. Hall, Department of Educational and Counselling Psychology

Dear First-Year McGill Student,

This email is to remind you once again of an opportunity to participate in an online study on academic procrastination. Students who participate will be entered into a draw for 5 cash prizes of $50, with the study consisting simply of a brief questionnaire (~20 mins).

If you are interested in participating, please click the link below to access the study website prior to October 15, 2018: https://www.surveymonkey.com/r/McGill2018

If you have any questions, feel free to contact the Principal Investigator, So Yeon Lee, at so.yeon.lee@mail.mcgill.ca or the Faculty Supervisor, Nathan Hall, at nathan.c.hall@mcgill.ca.

Thank you for your time!

Sincerely,

So Yeon Lee
Department of Educational and Counselling Psychology
McGill University

Dr. Nathan C. Hall
Department of Educational and Counselling Psychology
McGill University

Campus Life & Engagement
1010 Sherbrooke Street, Suite 203
Montreal, Quebec H3A 2R7
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firstyear@mcgill.ca

Appendix D

Questionnaire items

[Demographic information]

In this part of the survey, we ask for some factual information about you. Your answers to all of the questions are CONFIDENTIAL. The identifiable information will be removed at the end of the data collection.

What is your first name and last name? _____, _____

What is your student university email? _____
(Note: please provide student university email that ends with @mail.mcgill.ca)

With which gender do you most identify?

1. Female
2. Male
3. Gender Variant/Non-conforming
4. Other

If selected "other" for gender, please specify. _____

What is your age in years? _____

In what faculty/ school are you currently registered?

1. Faculty of Arts
2. Faculty of Agricultural and Environmental Sciences
3. Faculty of Dentistry
4. Faculty of Education
5. Faculty of Engineering
6. Faculty of Medicine
7. Faculty of Law
8. Faculty of Science
9. Faculty of Religious Studies
10. Desautels Faculty of Management
11. Schulich School of Music
12. McGill School of Environment
13. Bachelor of Arts and Science

How many credits are you enrolled in this semester at McGill?

(Note: A one semester course normally offer three credits) _____
What was your average (%) in your last year of schooling prior to starting university (high school/ CEGEP)? _____

Did you attend/ graduate from CEGEP?

1. No
2. Yes

[For students who select they attend or graduate from CEGEP]

In CEGEP, were you in a STEM (science, mathematics, engineering, technology) program?

1. No
2. Yes

What is your first language?

1. English
2. French
3. Chinese languages
4. Arabic
5. Punjabi / Hindi / Urdu
6. Italian
7. Tagalog
8. Spanish
9. German
10. Portuguese
11. Tamil
12. Other (open-ended)

If selected "other" for language, please specify. _____

What is your race/ethnic background?

1. Caucasian (European)
2. West Asian (Iran, Israel, Iraq, Turkey, Persia, Saudi Arabia, etc.)
3. South Asian (India, Pakistan, Sri Lanka, Afghanistan, etc.)
4. Southeast Asian (Philippines, Singapore, Thailand, Vietnam, etc.)
5. East Asian (China, Japan, N/S Korea, Taiwan, Hong Kong, etc.)
6. Latin, Central, South American
7. Pacific Islander
8. Caribbean
9. African
10. Aboriginal
11. Other (please specify: _____)

Are you registered as an international student?

1. No
2. Yes

[For students who select international residency]

What is your country of origin?

1. USA
2. France
3. China
4. India
5. Saudi Arabia
6. Iran
7. South Korea
8. Pakistan
9. United Kingdom
10. Germany
11. Japan
12. Turkey
13. Bangladesh
14. Mexico
15. Brazil
16. Australia
17. Italy
18. Switzerland
19. Taiwan
20. Egypt
21. Israel
22. Lebanon
23. Colombia
24. Other (open-ended)

How many years have you resided in Canada? (If less than one year, please type "0"). _____
What is the highest level of education your parent(s) obtained?

1. High school certificate or less
2. Bachelor's degree
3. Master's degree
4. PhD
5. I don't know

What GPA do you expect to obtain for this semester? Please estimate your GPA based only on the classes you are taking this semester, not your cumulative GPA. (Enter a number from 0 to 4.00). _____

[Procrastination]
The Pure Procrastination Scale (12 items)

Instructions: "The following items concern your first-year undergraduate experiences with procrastination on academic tasks." Please answer the question as honestly as possible."

Response Format: 1 (strongly disagree); 5 (strongly agree)

1. I delay making decisions until it's too late.
2. Even after I make a decision, I delay acting upon it.
3. I waste a lot of time on trivial matters before getting to the final decisions.
4. In preparation for some deadlines, I often waste time by doing other things.
5. Even jobs that require little else except sitting down and doing them, I find that they seldom get done for days.

6. I often find myself performing tasks that I had intended to do days before.
7. I am continually saying "I'll do it tomorrow"
8. I generally delay before starting on work I have to do.
9. I find myself running out of time.
10. I don't get things done on time.
11. I am not very good at meeting deadlines.
12. Putting things off till the last minute has cost me money in the past.

[Attributions for Procrastination]
Revised Causal Dimension Scale (CDSII, 8 items)

Instructions: "The following items pertain to your first-year undergraduate experiences with procrastination on academic tasks."

In your opinion, what is generally the most likely reason for why you may procrastinate on academic tasks.

[Open-ended response] _____

The items below concern your more specific opinions about this possible cause of procrastination.

Is the cause generally something;

Response Format: 9 (left hand option) to 1 (right hand option)

1. Manageable by you	9-1	not manageable by you
2. Permanent	9-1	temporary
3. Over which others have control	9-1	over which others have no control
4. Inside of you	9-1	outside of you
5. Under the power of other people	9-1	not under the power of other people
6. Something about you	9-1	something about others
7. Over which you have power	9-1	over which you have no power
8. Unchangeable	9-1	changeable

[Attribution-dependent emotions - procrastination]

Instructions: The following items concern the emotions you may experience after realising you are procrastinating on an academic task. For each emotion, please indicate its strength by selecting the number that best describes the typical intensity of that emotional response.

Response format: 1 (not at all true); 5 (very strong)

1. Guilt	2. Surprise	3. Shame
4. Pride	5. Regret	6. Hope
7. Anger (at yourself)	8. Anger (at others)	9. Relief
10. Helplessness	11. Apathy	