

ORIGINAL ARTICLE

## *Procrastination and anxiety: Exploring the contributions of multiple anxiety-related disorders*

Taylor E. Hutchison<sup>A,B,C,D,E,F</sup>, Alexander Murley Penney<sup>A,B,C,D,E,F</sup>, Jessica E. Crompton<sup>A,B,E,F</sup>

MacEwan University, Edmonton, Canada

### BACKGROUND

Procrastination is the unnecessary delay of a task that subsequently creates anxiety (Rothblum, Solomon, & Maurakami, 1986). Research suggests that procrastination is linked with poorer mental health, but questions remain regarding its association with anxiety disorders. Studies exploring obsessive-compulsive disorder (OCD) and procrastination have found high levels of procrastination in OCD (Ferrari & McCown, 1994), but have also found no association between obsessive thoughts and procrastination (Kağan, Çakır, İlhan, & Kandemir, 2010). Scher and Osterman (2002) found that procrastination correlated with physiological anxiety and social anxiety, but not worry. No previous research has examined the connection between procrastination and health anxiety.

### PARTICIPANTS AND PROCEDURE

A non-clinical university sample ( $N = 300$ ) completed online self-report questionnaires in order to examine the relationships between procrastination and symptoms of

OCD, generalised anxiety disorder, social anxiety disorder, health anxiety, and panic disorder.

### RESULTS

Symptoms of panic disorder, social anxiety disorder, and health anxiety correlated with levels of procrastination. However, using a multiple regression analysis, only panic disorder symptoms uniquely predicted procrastination.

### CONCLUSIONS

It is proposed that people with panic disorder may procrastinate to avoid anxiety inducing situations, or that individuals who frequently procrastinate may become sensitive to the anxiety caused by procrastination, thereby potentially triggering panic disorder. The full implications of these findings are further discussed.

### KEY WORDS

panic disorder; health anxiety; obsessive-compulsive disorder; generalised anxiety disorder; social anxiety disorder

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CORRESPONDING AUTHOR – Alexander Murley Penney, Ph.D., MacEwan University, 10700-104 Avenue, T5J 4S2 Edmonton, Canada, e-mail: [alexander.penney@macewan.ca](mailto:alexander.penney@macewan.ca)

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## BACKGROUND

Procrastination is the act of delaying the beginning or the completion of an important task (Rothblum, Solomon, & Maurakami, 1986). Past research has revealed that individuals with high levels of procrastination differ from low procrastinators in emotional, cognitive, and behavioural domains (Ferrari & McCown, 1994). This suggests that procrastination is not exclusively a behavioural phenomenon. Rather, procrastination is a complex mechanism that consists of affective, cognitive, and behavioural components (Fee & Tangney, 2000). When used appropriately, delaying a task can be beneficial, such as completing a more important task before a less important one (Ferrari, 1991a). Indeed, procrastination should be adaptive, useful, and non-problematic for most individuals. However, when individuals begin to frequently engage in procrastination, it can become disadvantageous.

Solomon and Rothblum (1984) found that nearly one-quarter of students reported problems with procrastination on academic tasks such as writing a term paper, studying for exams, and completing assigned readings. Further, their results indicated a significant correlation between self-reported procrastination and a variety of clinical factors, such as depression, trait anxiety, and irrational cognitions. Solomon and Rothblum (1984) also revealed a significant negative correlation between procrastination and self-esteem. Flett, Blankstein, and Martin (1995) reported a positive correlation between scores on a procrastination scale and measures of perceived stress, negative life events, and daily difficulties. Overall, high procrastinators experience poorer mental health than individuals with low procrastination (Stead, Shanahan, & Neufeld, 2010). Ferrari (1991a) found that procrastination was linked with maladaptive tendencies, including lower self-esteem, and greater self-handicapping behaviours and public self-consciousness. Researchers have also explored the connection between procrastination and specific anxiety disorders, although this research is limited.

One specific anxiety disorder that has been examined in association with procrastination is obsessive-compulsive disorder (OCD). However, based on the limited number of studies, the findings remain equivocal. Ferrari and McCown (1994) found that individuals with OCD often engage in decisional and avoidant procrastination. They also found that individuals with OCD report higher levels of procrastination than family members without OCD (Ferrari & McCown, 1994). On the other hand, Kağan, Çakır, İlhan, and Kandemir (2010) found no support for the hypothesis that contemplation, a sub-dimension of obsessive thought, predicts academic procrastination.

Researchers have also examined the possible connection between procrastination and excessive worry. Leahy (2002) used a case-formulation approach to review the cognitive-behavioural model of generalised anxiety disorder (GAD) and found that his client used avoidance and procrastination as coping mechanisms. Similarly, Andrews et al. (2010) suggested that marked procrastination in decision-making behaviour due to worry should be included in the diagnostic criteria for GAD. Yet in a sample of children, Scher and Osterman (2002) found that procrastination was not associated with the degree of worry.

Ferrari (1991a) reported an association between procrastination and social anxiety, particularly, the fear of evaluation and seeking approval by others. Individuals with social anxiety often fear the possibility of negative evaluation, which could serve as motivation towards procrastination or delaying judgment. Various studies have also found a link between procrastination and evaluative concerns. In particular, procrastination may be used as a means of self-protection, and serve as a coping mechanism to both avoid and protect the individual from evaluation (Fee & Tangney, 2000; Ferrari, 1991a, 1991b). Female procrastinators tend to be more anxious and attempt to avoid judgement, whereby delaying a task can delay critical evaluation (Ferrari, 1991a). As the fear of judgement or scrutiny by others is one of the main characteristics of social anxiety disorder (Heitmann et al., 2014), it would appear reasonable to expect that procrastination would be associated with heightened social anxiety.

In addition to cognitive and affective aspects of anxiety disorders, procrastination may also be linked with physiological signs of anxiety. Procrastination is associated with an increase in anxiety, and high procrastinators exhibit greater physiological symptoms of anxiety compared to low procrastinators (Rothblum et al., 1986). Overall, procrastinators demonstrate higher amounts of stress and illness than non-procrastinators (Tice & Baumeister, 1997). Procrastination is linked with negative health outcomes, and symptoms of physical illness, leading to excessive visits to health-care professionals (Ferrari & Diaz-Morales 2014). In a similar vein, individuals with health anxiety often make frequent visits to various physicians in order to acquire reassurance or confirm their disease conviction (Salkovskis, Rimes, Warwick, & Clark, 2002). This indicates that in addition to being associated with the traditional anxiety disorders, procrastination may also be associated with excessive health anxiety. However, no previous research has directly examined this potential relationship.

Since procrastination is associated with both avoidance and physiological anxiety, this also suggests a possible connection between procrastination and panic disorder. One of the main characteristics

of panic disorder is the tendency to avoid situations from which it is difficult or embarrassing to escape (Liebscher et al., 2016). Research on procrastination indicates that avoidance is a main characteristic of procrastination, where procrastination tendencies may demonstrate a motivation to avoid a task or situation (Van Eerde, 2000). In the previously mentioned sample of children, Scher and Osterman (2002) examined the connections between procrastination and the physical symptoms of anxiety. Scher and Osterman (2002) used a procrastination/conscientiousness measure and found that the measure correlated with experiencing physiological anxiety. This indicates that procrastination may be associated with panic disorder because panic disorder is strongly linked with physiological symptoms of anxiety, and measures of physiological anxiety are often assumed to be measures of panic disorder. Krohne (1993) also suggested that avoidance may be prompted by an intolerance of arousal, which may help explain a possible relationship between procrastination and panic disorder.

While a number of studies indicate a link between anxiety and procrastination, the generalisability of many of these studies is limited. Many did not employ measures for specific anxiety disorders, but instead measured less pathological variations of the constructs. Therefore, a study that directly examines the connections between procrastination and symptoms of specific anxiety disorders would enhance the existing research. The purpose of this study was to explore the relationships between procrastination and symptoms of OCD, GAD, social anxiety disorder, health anxiety, and panic disorder.

Based on previous research, it was hypothesised that there would be significant relationships between procrastination and both panic disorder and social anxiety disorder symptoms. Further, it was hypothesised that there would be a significant relationship between procrastination and OCD symptoms. We expected to find no relationship between procrastination and GAD symptoms. Finally, since no previous research has examined procrastination in individuals with excessive health anxiety, no specific hypothesis was made.

## PARTICIPANTS AND PROCEDURE

### PARTICIPANTS

Participants included 300, non-treatment seeking, non-clinical undergraduate university students. Participants ranged in age from 16 to 59 years ( $M = 20.47$ ,  $SD = 4.87$ ). The majority of the participants were female (73.50%). Most participants were single (56.00%), while 36.90% reported being currently dating and 6.30% reported being married. Over half (59.00%) were Caucasian, with the remainder identifying as Asian (13.80%), Middle Eastern (6.90%), East

Indian (7.30%), African-Canadian (5.90%), or other minorities (7.10%).

### MEASURES

*Procrastination.* The *General Procrastination Scale* (GPS; Lay, 1986) was used to measure dispositional levels of procrastination. The GPS is a 20-item self-report measure, with higher scores reflecting greater procrastination. The GPS has high reliability and good construct validity (Ferrari, 1992). Lay and Burns (1991), and Morris and Fritz (2015) reported Cronbach's  $\alpha$  of .89, and .88, respectively. In the present study, the GPS had a Cronbach's  $\alpha$  of .79.

*OCD symptoms.* The *Obsessive-Compulsive Inventory-Revised* (OCI-R; Foa et al., 2002), an 18-item self-report inventory, was used to assess symptoms of OCD. The OCI-R has demonstrated good convergent validity, internal consistency, and test-retest reliability in patients with OCD and other anxiety disorders, as well as controls (Gönner, Leonhart, & Ecker, 2008). Hajcak, Huppert, Simons, and Foa (2004) reported a Cronbach's  $\alpha$  of .88 using a nonclinical student sample. A total of 129 participants scored above the clinical cut-off score (Foa et al., 2002). In the present study, the OCI-R had a Cronbach's  $\alpha$  of .91.

*Panic disorder symptoms.* The *Panic Disorder Severity Scale-Self Report* (PDSS-SR; Houck, Spiegel, Shear, & Rucci, 2002), a seven-item self-report measure, was used to assess symptoms of panic disorder, with higher scores indicating more frequent and intense symptoms. The PDSS-SR has good concurrent, convergent, and discriminant validity, adequate internal consistency, and excellent test-retest reliability (Lee, Kim, & Yu, 2009). Previous research indicated a Cronbach's  $\alpha$  ranging from .85 to .88 (Lee et al., 2009; Santacana et al., 2014). A total of 48 participants scored above the clinical cut-off score (Shear et al., 2001). In the present study, the PDSS-SR had a Cronbach's  $\alpha$  of .88.

*GAD symptoms.* The *Generalised Anxiety Disorder Questionnaire-IV* (GADQ-IV; Newman et al., 2002), a nine-item self-report diagnostic measure of GAD, was used to measure GAD symptoms. Higher scores indicate greater symptoms. In the present study, the original skip-out rule was removed, as is supported by previous research (Rodebaugh, Holaway, & Heimberg, 2008). The GADQ-IV has been shown to have good test-retest reliability, a single factor structure, and strong convergent and divergent validity, as well as good internal consistency (Newman et al., 2002; Rodebaugh et al., 2008). Using the dimensional scoring system, Luterek, Turk, Heimberg, Fresco, and Mennin (2002) reported a Cronbach's  $\alpha$  of .93. A total of 166 participants scored above the clinical cut-off score (Newman et al., 2002). In the present study, the GADQ-IV had a Cronbach's  $\alpha$  of .80.

*Social anxiety symptoms.* The Social Phobia Inventory (SPIN; Connor et al., 2000) was used to measure social anxiety symptoms. The SPIN is a 17-item self-report measure, with higher scores corresponding to more intense social anxiety symptoms. The SPIN has good convergent validity, discriminant validity, and great internal consistency (Connor et al., 2000). In previous research, the reported Cronbach's  $\alpha$  was .95 (Antony, Coons, McCabe, Ashbaugh, & Swinson, 2006). A total of 188 participants scored above the clinical cut-off score (Connor et al., 2000). In the present study, the SPIN had a Cronbach's  $\alpha$  of .92.

*Health anxiety.* The *Short Health Anxiety Inventory* (SHAI; Salkovskis et al., 2002) was used to measure health anxiety. The SHAI is an 18-item self-report measure, assessing health anxiety independent of physical health status. The SHAI has good convergent validity, divergent validity, internal consistency, and reliability in both clinical and nonclinical samples (Abramowitz, Deacon, & Valentiner, 2007; Salkovskis et al., 2002). In previous research, the Cronbach's  $\alpha$  was .86 (Abramowitz et al., 2007; Salkovskis et al., 2002). No participants scored above the clinical cut-off score (Hedman et al., 2015). In the present study, the SHAI had a Cronbach's  $\alpha$  of .88.

## PROCEDURE

Participants came from a research pool of undergraduate psychology students who received course credit in exchange for participation. Using an online participation system, students self-enrolled in the study. Upon reading a consent form describing the nature of the study, consenting participants completed a demographics questionnaire, followed by the six self-report measures described previously. At the conclusion of the questionnaires, participants were shown an online debriefing form. Ethical approval for this study was obtained from the university Research Ethics Board.

## STATISTICAL ANALYSES

Pearson product-moment correlations were conducted to examine the correlations between the GPS and the six symptom measures. To examine if the associations between the GPS and the measures of interest were unique (i.e. not due to overlapping variance amongst measures), a multiple regression analysis was conducted. With the GPS set as the dependent variable, all symptom measures were entered on a single step. For all analyses,  $\alpha$  was set to .05.

## RESULTS

As shown in Table 1, the GPS positively correlated with the PDSS-SR, SPIN, and SHAI. Correlations between the GPS and the OCI-R and GADQ-IV were not significant. As also shown in Table 1, there were moderate correlations between all symptom measures. The correlations between symptom measures justified the need to use the multiple regression analysis to examine whether any of the symptom measures uniquely predicted GPS scores. The multiple regression analysis was significant,  $R = .22$ , adjusted  $R^2 = .05$ ,  $F(5, 264) = 2.57$ ,  $p = .027$ . The analysis revealed that only the PDSS-SR uniquely predicted scores on the GPS (see Table 2).

## DISCUSSION

The present study examined the relationships between procrastination and specific anxiety disorder symptoms in a non-clinical population. In line with the hypotheses, the results of this study revealed an association between procrastination and both panic disorder and social anxiety symptoms. By including a measure of excessive health anxiety, this study was also the first to find a relationship between procrastination and health anxiety. The findings also sup-

Table 1  
*Zero-order correlations between measures*

	GPS	OCI-R	GADQ-IV	PDSS-SR	SPIN	SHAI
GPS	–	.07	.10	.18**	.14*	.14*
OCI-R		–	.52**	.45**	.46**	.42**
GADQ-IV			–	.55**	.50**	.56**
PDSS-SR				–	.48**	.46**
SPIN					–	.36**
SHAI						–

Note. GPS – *General Procrastination Scale* total score; OCI-R – *Obsessive-Compulsive Inventory – Revised* total score; GADQ-IV – *Generalised Anxiety Disorder Questionnaire-IV* total score; PDSS-SR – *Panic Disorder Severity Scale – Self Report* total score; SPIN – *Social Phobia Inventory* total score; SHAI – *Short Health Anxiety Index* total score.

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

Table 2  
Regression Analysis Predicting GPS Scores

Variable	$\beta$	$t$	$pr$
OCI-R	-.07	-0.99	-.06
GADQ-IV	-.04	-0.45	-.03
PDSS-SR	.15*	1.98*	.12*
SPIN	.09	1.18	.07
SHAI	.10	1.27	.08

Note.  $pr$  – partial correlation; GPS – General Procrastination Scale total score; OCI-R – Obsessive-Compulsive Inventory – Revised total score; GADQ-IV – Generalised Anxiety Disorder Questionnaire-IV total score; PDSS-SR – Panic Disorder Severity Scale – Self Report total score; SPIN – Social Phobia Inventory total score; SHAI – Short Health Anxiety Index total score.  
\* $p < .05$ .

ported the hypothesis that GAD symptoms would not be related with procrastinations, yet the finding that OCD symptoms did not significantly correlate with procrastination contradicted our hypothesis. Finally, while social anxiety and health anxiety were associated with procrastination at a zero-order level, when controlling for the overlap in variance amongst the symptom measures, the results revealed that only panic disorder symptoms uniquely predicted procrastination.

Panic disorder has previously been linked to different types of avoidance behaviour (Craske & Barlow, 1988). Krohne (1993) suggested that avoidance is prompted by an intolerance of arousal, which may help account for this relationship. It seems plausible that individuals with panic disorder would use avoidance tactics to escape specific situations in which they are likely to have a panic attack, including procrastinating on tasks that increase their anxiety. Craske, Sanderson, and Barlow (1987) found that patients report the development of varying degrees of avoidant behaviour after, rather than before, experiencing a panic attack. Avoided situations or tasks may therefore lead to developing conditioned stimuli, and this would elicit anxiety in a secondary fashion, prompting greater procrastination. Alternatively, since procrastination is known to trigger anxiety (Rothblum et al., 1986), it is possible that individuals who procrastinate frequently may become more aware of their anxiety. As their anxiety sensitivity increases, the individuals may begin to develop panic disorder. Future research may be able to delineate these possible causal links between panic disorder and procrastination.

Individuals with excessive health anxiety exhibit anxiety about their health that is disproportionate to their medical status, and therefore frequently seek out health care professionals to confirm their disease conviction (Taylor, Thordarson, Jang, & Asmundson, 2006). At first glance, it seems unlikely that someone

with health anxiety would delay the process of confirmation (Taylor et al., 2006). This suggests that there may be underlying avoidance behaviours, including forms of procrastination, in health anxiety that maintain their fixation on disease conviction concurrent with their attempt to avoid medical triggers for anxiety. Some individuals with health anxiety attempt to avoid a variety of triggers and situations related to illness, such as hospitals and media references (Warwick, 1989). Because avoidance behaviours often lead to a short-term reduction in anxiety, they are often maintained long-term (Warwick, 1989). Perhaps, a subset of individuals with health anxiety procrastinate on exploring their symptoms as a means to avoid triggers of their health anxiety. Another possibility is that individuals with health anxiety may become procrastinators because of their tendency to prioritize their health and fixate on confirming their presumed disease, resulting in neglect of other aspect of their life

Panic disorder and excessive health anxiety are both consequences of the persistent tendency to misinterpret bodily changes as indicative of possible harm (Salkovskis & Clark, 1993). There is considerable overlap between the two disorders, and it may be plausible to assume that their mutual tendency to fixate on physical characteristics and avoid illness-related cues may contribute to their relationship with procrastination. This overlap may also help explain why health anxiety no longer significantly predicted procrastination once entered into the regression equation alongside panic disorder symptoms.

Individuals with social anxiety often fear the possibility of negative evaluation, which could serve as motivation towards procrastination or the delay of judgment (Fee & Tangney, 2000). Previous research revealed an association between procrastination and social anxiety, particularly the fear of evaluation (Ferrari, 1991a). Various studies have found a link between procrastination and evaluative concerns (Ferrari, 1991a, 1991b). Yet in the present study, social anxiety symptoms did not emerge as a unique predictor of procrastination. This indicates that procrastination may be a significant issue for only a small proportion of individuals experiencing social anxiety. However, as suggested by the results of our regression equation, any relationship between social anxiety and procrastination may also be attributable to the variance both constructs share with panic disorder.

Previous research evaluating the role of OCD and GAD symptoms in procrastination has been equivocal. As hypothesised, we found no connection between procrastination and GAD. This aligns with the findings of Scher and Osterman (2002), who found that worry was not related to procrastination in children, and the findings do not support the suggestion of including procrastination as a diagnostic criteri-

on for GAD (Andrews et al., 2010). Regarding OCD, the findings do not align with Ferrari and McCown's (1994) previous research suggesting a link between procrastination and OCD. At the zero-order, the current study found no connection between procrastination and OCD. Our results are consistent with Kağan et al. (2010), who reported no correlation between OCD and procrastination. Although previous research has connected procrastination with OCD, it may be the overlap between OCD and other anxiety disorders, or the type of measurement tools and samples studied, accounting for the connection.

Researchers may wish to further investigate the relationship between procrastination and panic disorder. Although the current study suggests a link between procrastination and panic disorder, we were unable to examine the direction of this relationship. It may be the fear of having a panic attack that leads one to avoid specific tasks and procrastinate. It may also be that procrastination tendencies lead to heightened physiological anxiety, and therefore increases the chances of experiencing a panic attack. Longitudinal studies would help clarify the directionality, as well as help determine the stability of this relationship. It is also plausible that a third variable, such as depression (Solomon & Rothblum, 1984), may play a role in the relationship between procrastination and panic disorder. Therefore, future researchers may also wish to consider other mental disorders to examine. Research on procrastination and panic disorder is quite limited, and further investigation is necessary to better understand the relationship.

Further research evaluating the generalisability and clinical implications of the present study may help advance current research on the role of panic disorder in procrastination. The results of this study are limited by the nonclinical, university sample. The sample was primarily female, and the majority of participants were Caucasian. The extent to which the results generalise to other cultures should be examined. Future researchers may wish to advance our findings and evaluate procrastination in a diverse clinical population.

## CONCLUSIONS

The present study examined the relationships between procrastination and symptoms of OCD, GAD, social anxiety disorder, health anxiety, and panic disorder in a non-clinical sample. Panic disorder, health anxiety, and social anxiety positively correlated with procrastination at the zero-order level. However, when controlling for the overlap amongst the anxiety measures, only panic disorder uniquely predicted procrastination. This suggests that although procrastination has been linked to OCD, panic attacks, and social anxiety in previous research, it appears that

panic disorder may specifically account for the link between anxiety disorders and procrastination. We propose that people who experience panic disorder may procrastinate as a means to avoid anxiety inducing situations that may lead to a panic attack, or that individuals who frequently procrastinate may become sensitive to the anxiety caused by procrastination, thereby potentially triggering panic disorder. Future researchers could explore additional, long-term research on procrastination to evaluate these proposed links between procrastination and panic disorder, and therapists may wish to consider inquiring about procrastination tendencies with their clients.

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