



Investigating the interaction effects of academic procrastination and psychological flexibility on happiness.

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ABSTRACT

Academic procrastination at university has long been an issue investigated by researchers due to its importance both for students' well-being and for their success in future careers. Despite this research, neither a unified theory of the exact cause, nor a widely accepted intervention method have been proposed. One proposed intervention concerns psychological flexibility from the third-wave behavioural approach, Acceptance and Commitment Therapy. The current study considered the effects that procrastination and psychological flexibility can have on happiness. In this regard it was the first study to consider this relationship. University students ($N = 110$) completed self-report measures of happiness, procrastination and psychological flexibility. A moderation analysis was then carried out on this cross-sectional data to assess psychological flexibility as a potential moderator in the relationship between procrastination and happiness. A significant strong inverse correlation was found between procrastination and psychological flexibility. It was also found that at high levels of psychological flexibility, those who procrastinated were experiencing very low levels of happiness. As such, a threshold effect in this relationship is suggested; those who are highly psychologically flexible can persevere with task completion at low levels of happiness. At very low levels of happiness, only then will they engage in procrastination. Further research into this moderation relationship, specifically with a longitudinal design, is recommended.

KEY WORDS:	ACADEMIC PROCASTINATION	PSYCHOLOGICAL FLEXIBILTY	HAPPINESS	MODERATION ANALYSIS
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Introduction

The importance of reducing procrastination in students is becoming more and more significant; from protecting their psychological well-being whilst studying, to ensuring that they are able to adapt to the changing working environment that expects employees to be more self-directed in their work (as discussed by Steel, 2007). Interventions aimed at reducing procrastination vary considerably and have mixed success rates. In recent years, psychological flexibility, part of Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson, 1999) has been suggested as a possible approach to lower levels of procrastination and raise levels of psychological well-being. The current study will discuss the interaction effects of academic procrastination and psychological flexibility on happiness levels in order to further consider the potential that ACT may have in developing a wide-reaching and successful intervention for academic procrastination.

Procrastination is defined as the conscious delay of tasks which must be completed, whilst being aware that this will lead to a more negative outcome (Steel, 2007). One of the specific areas of procrastination that has been frequently researched is academic procrastination. An experimental study gave student participants a possible 15 minutes to practice for a mathematical test. The moods of the participants were manipulated, they were then told whether or not their moods could be changed and they were indirectly offered either interesting or boring distractors to avoid practicing for the test. Those who were manipulated into a bad mood and told that their mood was changeable procrastinated more than those in any other condition, supporting the notion of procrastination as an activity undertaken in an attempt to improve mood (Tice, Bratslavsky & Baumeister, 2001). Similarly, those in the experiment who were also manipulated into a bad mood but told that their bad mood was unchangeable procrastinated the least out of all of the participants (Tice et al., 2001). The findings of this study must be treated cautiously as the unchangeable mood category involved participants simply being told that a lit aromatherapy candle would maintain the mood that they had been manipulated into based on their condition allocation. As well as this, the outcome of the task in Tice and colleagues' (2001) study did not affect the participants' degree grade, suggested to be important in relation to academic procrastination due to pressure to succeed. Nevertheless, the findings of this study suggest that mood is important in academic procrastination research, whilst the distractions that are available are less important.

Sirois and Pychyl's (2013) review of procrastination as a form of self-regulation failure further supports the above. When a task is unpleasant it is avoided, then becoming a problem for the future self. The task does not disappear but instead can be forgotten about in the short-term, therefore temporarily repairing the negative mood (Sirois & Pychyl, 2013). Yet in spite of this, it has been found that well-being overall is much worse for those who have engaged in procrastination once the deadline for the task approaches (Tice & Baumeister, 1997). Tice and Baumeister's (1997) study benefitted from a longitudinal design, with regular and varied measures of procrastination and health and stress symptoms.

Another study which looked at the particular relationship that procrastination has with psychological well-being, in this instance, specifically with the mental health conditions anxiety and depression, aimed to assess the importance of rumination and worry (Constantin, English & Mazmanian, 2017). The study found that rumination mediated the relationship between anxiety and depression as separate dependent

variables and the outcome of procrastination. However, worry, in contrast, did not mediate either relationship. These results support the findings by Stöber and Joorman (2001), anxiety and depression were no longer correlated with procrastination when worry was partialled out of the correlation calculations. This further supports the aforementioned conceptualisation of procrastination; worry concerns the future self (Stöber & Joorman, 2001), whereas procrastination is specifically concerned with the present self, better explained by rumination (Constantin et al., 2017). Research carried out by Glick and Orsillo (2015) suggested that procrastination could be a consequence of a person's response to anxiety, rather than simply to anxiety itself.

A similar study looked instead at procrastination as a pre-cursor to mental health problems, specifically depression in this study, as opposed to the relationship being in the opposite direction, as above. It was suggested that due to maladaptive self-control schemas, it is possible that procrastinators are more affected by criticism and shame and as such lack the ability to use such factors as self-efficacy and optimism to prevent the negative affect of depression (Aftab, Klibert, Holtzman, & Aftab, 2017). It was also suggested that as part of the avoidance of distress, people who procrastinate and feel uncomfortable engaging in protective behaviours are also less likely to seek help when they are feeling this way, thus leading to symptoms likely worsening. Nevertheless, Aftab and colleagues (2017) highlighted that depression may contribute to more procrastination, showing a possible circular or bi-directional relationship, rather than one being the outcome of the other.

A final consideration in the area of procrastination research is personality. A meta-analytic review carried out by Steel in 2007 found that procrastination can be explained by low conscientiousness and self-regulatory failure. There were also associations to how distractible or organised a person is as well as their motivations to succeed and whether they carried out actions that helped them towards their long-term goals (Steel, 2007). The importance of conscientiousness continues to be reported (Kim, Fernandez & Terrier, 2016) as well as neuroticism (Wang et al., 2017), however, the other three personality traits (openness to experience, extraversion and agreeableness; McCrae & Costa, 1987) have been suggested to further explain peoples' reasons for procrastinating (Steel & Klingsieck, 2016). Ultimately, despite the sizable amount of research that has been carried out in the area of personality, it is beyond the scope of the current discussion to fully discuss its relationship to procrastination. Nevertheless, due to the difficulties associated with changing personality, it is helpful to look to other related processes which might yield possible intervention strategies. As such, whilst still considering the impact of personality, a more well-rounded intervention is needed.

One such area which can instead be considered is goal setting and motivation. Goal setting theory should counteract procrastination (Gröpel & Steel, 2008) but there is a difference between making intentions and acting on intentions (Steel, 2010). Procrastination is a dysfunctional delay (Steel, 2010) so further variables are involved which must be considered in order to intervene and prevent the delay. A longitudinal study investigated procrastination and found that although work intentions were similar across participants, those prone to procrastination needed an externally imposed nearing deadline in order to carry out their planned work (Steel, Svartdal, Thundiyil & Brothen, 2018). A large group of students across a term-long module were assigned tasks which had to be completed by the end of the term, however, they could obtain twice the number of points if the tasks were completed weekly. The research found that people who procrastinate are impulsive and diversions will be focused on when a

work deadline is distant. When the deadline becomes nearer, the work will be completed. The researchers deemed these participants to be easily tempted by distractions. Although this study, like much of the research into procrastination, was correlational rather than experimental, Steel and colleagues (2018) found that Temporal Motivation Theory (TMT) better explained procrastination than did goal setting theory. TMT takes into account the irrationality of procrastination and considers that there is often an intention-action gap preventing people from starting to work on tasks early despite intending to (Steel et al., 2018).

As discussed, the importance of whether or not a person can deal with negative feelings in order to prioritise their future self over their present self (Sirois, 2014) links the above discussion of procrastination with the other focus of the current study, psychological flexibility. Psychological flexibility is an important part of the third-wave behavioural therapeutic approach, ACT (Hayes et al., 1999). ACT is a therapy that focuses on the idea that difficult things happen in life and cannot be avoided. In spite of this, they can be made to be easier to deal with by embracing negative feelings and learning to experience them in a way that will be less painful (Blackledge & Hayes, 2001). One of the important acknowledgements of ACT is that this avoidance of negative emotions is often linked to mental health problems and distress (Blackledge & Hayes, 2001). The avoidance of negative emotions is labelled as experiential avoidance and this, when also considering a lack of engagement with values, is labelled as low psychological flexibility. Psychological flexibility is the ability to engage with negative thoughts and feelings and continue to work towards things that you value, including long-term goals (Hayes et al., 2004). It has been found that level of psychological flexibility is a good predictor of mental health; those with high psychological flexibility are less likely to suffer from mental health problems (Bond et al., 2011).

Procrastination, like psychological flexibility, has been linked to poor mental health (Aftab et al., 2017) as well as a lower likelihood of help-seeking for mental health problems (Stead, Shanahan & Neufeld, 2010). In spite of this, in higher education settings students find help-seeking for procrastination easier than help-seeking for mental health problems (Scent & Boes, 2014) so it is an important concept to help higher education providers to support their students. Importantly, it has been found that high levels of psychological flexibility correlate with low levels of psychopathology and higher quality of life reports (Hayes, Luoma, Bond, Masuda & Lillis, 2006). These links suggest that an ACT-based intervention for academic procrastination could lead to better psychological well-being for students. There are currently six studies in this area; three of which were correlational, one of which was partially experimental and the remaining two of which were experimental. Each of these studies will now be discussed.

Early research into psychological flexibility processes was carried out looking into the possible connection between procrastination and mindfulness (Sirois & Tosti, 2012), an important skill in ACT. Those who procrastinate need to engage with the present moment; to avoid allowing their own critical thoughts and non-self-compassionate view from preventing them from engaging in tasks that are beneficial to them in the long-term (Flett, Haghbin & Pychyl, 2016). Sirois and Tosti (2012) had 339 student participants complete measures of procrastination, mindfulness, perceived stress and perceived health. They aimed to assess the potential of mindfulness being a mediator in the procrastination-stress and procrastination-health models. The study was a cross-sectional test of a mediation model hence the findings

can neither infer causality nor fully test the directionality of the relationship. Nevertheless, it was found that procrastination was associated with high stress and low mindfulness as expected (Sirois & Tosti, 2012). Ultimately, although mindfulness is likely to be helpful it must be considered that it may be difficult to engage people in devoting time to its practice, hence a more all-encompassing therapy would be more beneficial.

An initial study based on ACT processes looked at committed action (Gagnon, Dionne & Pychyl, 2016), one of six core processes that make up psychological flexibility in the ACT Hexaflex (this model is described in Harris, 2009). Committed action involves working through activities to achieve goals despite the activities being uncomfortable for the individual. As procrastination is seen as engaging in avoidant behaviours, the researchers looked at this as being opposite to committed action and that committed action might be able to predict procrastination (Gagnon et al., 2016). This study involved a large group of students who completed measures of procrastination, psychological well-being, psychological flexibility, cognitive fusion, mindfulness and committed action; resulting in a total of 69 items. This could have led to participant fatigue which the current study will avoid by using a more comprehensive measure of all aspects of psychological flexibility. Despite this limitation, the findings of the study suggest that committed action, as well as other aspects of psychological flexibility, in particular acceptance, are important in developing interventions to reduce procrastination (Gagnon et al., 2016).

A study which looked at the connection between psychological flexibility and procrastination suggested that procrastination can be seen as a result of low psychological flexibility rather than as a result of other potential causes discussed (Glick, Millstein & Orsillo, 2014). Ultimately, the study found preliminary suggestions that increasing psychological flexibility could be a potential intervention for reducing procrastination (Glick et al., 2014). One of the limitations of the study was the use of both the Acceptance and Action Questionnaire (AAQ; Hayes et al., 2006) and the AAQ-II (Bond et al., 2011) which required further measures to fully assess psychological flexibility (as discussed by Wolgast, 2014). As with Gagnon and colleagues' (2016) study, this could have led to participant fatigue and difficulty in deciding the relative importance of each construct. As such, in order to better investigate these findings, the current study used the Comprehensive assessment of Acceptance and Commitment Therapy processes (CompACT; Francis, Dawson & Golijani-Moghaddam, 2016) to fully assess each process of psychological flexibility.

An early investigation into how ACT could be used as an intervention to reduce procrastination found promising preliminary results (Scent & Boes, 2014). This involved eight students taking part in a brief intervention which consisted of two 90-minute workshops, teaching ACT processes, spaced one week apart. Six students also attended just one workshop. Statistical results were not given but using the Acceptance and Action Questionnaire II (AAQ-II; Bond et al., 2011), the Procrastination Assessment Scale - Students (PASS; Solomon & Rothblum, 1984) and a measure of experiential avoidance, all participants were reported as having demonstrated an increase in psychological flexibility and a decrease in procrastination. The intervention was short-term and the sample size was very small, however, a follow up survey found that participants would recommend the intervention to their peers and that they personally thought that their procrastination levels had decreased (Scent & Boes, 2014). Nevertheless, the true long-effects of the intervention cannot be seen from this particular study.

Glick and Orsillo (2015) also carried out an intervention to reduce academic procrastination. This intervention improved upon Scent and Boes' (2014) study by randomising 118 participants to one of two intervention groups and by including a behavioural measure of procrastination rather than relying solely on self-report data. Glick and Orsillo (2015) used a Time Management intervention ($n = 69$; this involved teaching the participants to have realistic expectations of the time that will be required to complete a task and how to schedule tasks whilst taking into account possible things that might prevent these plans from being achieved) and an Acceptance-Based Behavioural Therapy intervention (ABBT; $n = 49$; participants in this group were taught about experiential avoidance in the context of completing academic tasks, guided through a mindfulness session and told about the importance of acting in ways that are consistent with their values). The interventions were delivered online and lasted for 20 minutes, however, neither intervention led to participants procrastinating less. Based on previous research discussed thus far it is likely that the effects of a 20-minute intervention in learning ACT processes will not last until the end of the term, the time point of the second measurement completion in Glick and Orsillo's (2015) study.

Another, more longitudinal, investigation into ACT as an intervention was carried out by Wang and colleagues (2017). They recruited students who were high in neuroticism and predicted that an ACT intervention would reduce neuroticism and as such also reduce levels of procrastination. Participants were randomised to one of three groups, strengthening the design of this study compared with the previous interventions discussed; this was a better assessment of changes that were truly being caused by the interventions as opposed to changes that may have happened anyway. There were 20 participants in the ACT group, 19 in the CBT group (who followed treatment outlined by Ferrari, Johnson & McCown, 1995) and 21 in a control group. Participants in the intervention groups completed eight, weekly 180-min sessions and procrastination levels were tested at pre-intervention, post-intervention and at a three month follow up stage. It was found that both of the interventions reduced levels of procrastination, however, only ACT had a significant three month follow up effect of continued reduced levels (Wang et al., 2017). These findings support the need for longer sessions over several weeks to prolong the beneficial effects of the ACT-based intervention.

From the research discussed thus far it is suggested that there are connections between procrastination and psychological flexibility and happiness levels. However, the gap in this research concerns whether or not procrastination and psychological flexibility interact and what effect this might have on happiness levels. The importance of an intervention which works for many people, with different causes of their procrastination is clear from the literature. As with many of the previous studies, the current study will use the PASS (Solomon & Rothblum, 1984) to measure academic procrastination. The Oxford Happiness Questionnaire – Short Form (OHQSF; Hills & Argyle, 2002), a non-clinical scale, will be used to measure happiness. Finally, in order to improve the validity of the measurement of psychological flexibility, as discussed above, the CompACT scale (Francis et al., 2016) will be used. All of the above are suitable for completion via an online questionnaire, as has been used in the previous research discussed.

The first hypothesis of the current study is that there will be an inverse correlation between procrastination and psychological flexibility. It is expected that as psychological flexibility increases, procrastination will decrease. The second hypothesis of the current study is that there will also be an inverse correlation between

procrastination and happiness but that psychological flexibility will have a moderating effect on this relationship. It is expected that at lower levels of psychological flexibility, higher levels of procrastination will lead to lower happiness scores. It is also expected that at higher levels of psychological flexibility, higher levels of procrastination will not have such a negative effect on happiness; as psychological flexibility will be acting as a protective factor.

Method

Participants

Convenience sampling was used to recruit 124 participants with an age range of 18 to 51 ($M = 21.75$, $SD = 5.43$) and six participants did not give their age. The genders of the participants were as follows; female = 107, male = 14, one non-binary participant and two participants preferring not to say. All participants were current university students with 113 undergraduates, 10 postgraduates and one participant preferring not to give their level of study. Participants were recruited using the Research Participation System (RPS) at the University of Chester, posters on the University of Chester campus and through word of mouth (leading to participants being recruited from other universities in the North of England). The online study entitled “psychological predictors of procrastination and personality” was hosted on the Online Surveys site. Ethical approval was obtained from the University of Chester’s Ethics Committee and the BPS’s Code of Ethics and Conduct was adhered to (British Psychological Society, 2018).

Measures

Three existing psychological scales were used in the study; the Oxford Happiness Questionnaire – Short Form (OHQSF; Hills & Argyle, 2002), the first two sub-scales (Frequency of Procrastination and Reasons for Procrastination) of the Procrastination Assessment Scale – Students (PASS; Solomon & Rothblum, 1984) and the Comprehensive assessment of Acceptance and Commitment Therapy processes scale (CompACT; Francis, Dawson & Golijani-Moghaddam, 2016). Each item of each scale had a prefer not to answer option.

The OHQSF is a measure of happiness and psychological well-being. It is an eight-item short form of the 29-item scale and three of the eight items are reversed scored. The scale is answered on a six-point Likert scale. The OHQSF has been validated for repeated use with university students and found to have an average Cronbach’s alpha of $\alpha = 0.6$ (Cruise, Lewis & McGuckin, 2006), which is said to be sufficient for a scale with less than 10 items (Loewenthal, 2001). A total score was computed for each participant and higher scores indicated greater happiness, with the highest possible score being 48.

The PASS is a measure of academic procrastination. The first sub-scale is entitled Areas of Procrastination and measures frequency. It consists of six sets of three questions and the six sets give areas such as “Studying for exams”. The participants were asked how much they procrastinate in the given area, how much of a problem it is for them and how much they would like to change it. A five-point Likert scale forms the potential responses from “Never procrastinate/Not at all a problem/Do not want to decrease” to “Sometimes/Sometimes/Somewhat” in the middle to “Always procrastinate/Always a problem/Definitely want to decrease” at the end. The wording of two of the Areas of Procrastination were changed slightly to suit a British sample rather than a North American sample. “Writing a term paper” was changed to “Writing

a piece of coursework” and “Attendance tasks: Meeting with your advisor, making an appointment with a professor” was changed to “Attendance tasks: Meeting with your supervisor, making an appointment with a lecturer”. The total of the first two questions in each of the six areas gives an overall frequency score, with higher scores showing a higher frequency of academic procrastination and the highest possible score being 60. The second sub-scale of the PASS is the Reasons for Procrastination which is a 26-item sub-scale. It gives the participant a scenario in which they have been procrastinating and asks them why they have done this. This sub-scale is not used to generate a score for the participant but instead can be used to explain procrastination. There is also a third eight-item sub-scale entitled Interest in Changing Your Procrastination which is frequently omitted when the survey is not being used to recruit participants for interventions (e.g., Glick, Millstein & Orsillo, 2014).

The CompACT is a measure of psychological flexibility. It is a 23-item scale with 12 of the items being reversed scored. It is made up of three sub-scales; Openness to Experience, Behavioural Awareness and Valued Action; which have 10, five and eight items respectively. The scale is traditionally answered on a seven-point Likert scale. However, it has been argued that having a “neither agree nor disagree” option can prevent researchers from fully understanding the relative importance of sub-scales which each measure distinct constructs (Sturgis, Roberts & Smith, 2012). Some research has found that having an even-numbered Likert scale can have a negative effect on the validity of the findings when participants cannot decide between agree or disagree (Johns, 2005). Nevertheless, it was found that providing that the questions are clear, even-numbered scales can prevent social desirability (Johns, 2005; Wakita, Ueshima & Noguchi, 2012). Further, in this case, a participant could answer “neither agree nor disagree” for every question and have a middling score of 69 without properly providing any insight into their level of psychological flexibility. Therefore, the scale for the CompACT was changed to reflect the above and participants were asked to answer on a six-point Likert scale. Psychological flexibility has been frequently measured using the Acceptance and Action Questionnaire (AAQ; Hayes, Luoma, Bond, Masuda & Lillis, 2006) and the AAQ-II (Bond et al., 2011). However, it has been found that the AAQ and AAQ-II focus on certain aspects of psychological flexibility rather than all six components (Wolgast, 2014). The CompACT has been found to have strong face and content validity (Francis et al, 2016) as well as having greater incremental validity and considering all six components of psychological flexibility, over and above the AAQ-II. A total score was computed for each participant and higher scores indicated higher levels of psychological flexibility, with 138 being the highest potential score.

Procedure

Participants first encountered the study either on RPS, where they could sign up to register their interest and view the participant information sheet on Online Surveys. Alternatively, the participant could have encountered the poster on campus, after which they emailed the researcher to register their interest and were sent the direct link to the participant information sheet on the Online Surveys site. After reading the participant information sheet, if the participant decided that they didn't want to take part they could exit out of the study. If they decided that they did want to take part they clicked the “Next” button. The consent page then appeared; participants had to choose “I agree – Next” in response to six statements and then click “Next” to start the survey. If they chose “I do NOT agree – Quit study” and clicked “Next” they were taken to the

exit page and informed that the study required informed consent in order to access the questions.

The participant was then asked to answer the demographic questions which included their age, gender, level of study and their RPS code if they were a member of the University of Chester psychology department.

The next three pages of the study showed the OHQSF, then the first two subscales of the PASS and then the CompACT. Each scale was shown on its own page and none of the scales were labelled so as to avoid this influencing the participants' answers.

Finally, the participants encountered the debrief sheet. This explained that the study investigated psychological predictors of procrastination and personality, which was clear all of the way through the study.

Ethics

There were three main ethical considerations of the current study. Firstly, it was important to maintain throughout the completion of the study that the measures used were not diagnostic in any way. In order to do this the names of the scales were not used as headings of each page of the Online Survey, the pages were simply numbered. Secondly, in order to prevent the study being clinical, which would not be appropriate for the target sample, the OHQSF (Hills & Argyle, 2002) was used to measure happiness levels, rather than using a measure of depression or anxiety for example. Finally, it was important to consider that participants could potentially be distressed by drawing their attention to their existing difficulties with procrastination. In order to support them should this happen they were advised on the debrief sheet to contact their university's support department or the Samaritans, contact details for whom were provided.

Design and Analysis

Power calculations were carried out *a priori* using G*Power. These calculations recommended that 68 participants would be needed to detect a medium effect size, in psychology, of $f^2 = 0.15$; using a regression analysis at an alpha level of $p < 0.05$, a power level of 0.80 and with two predictors (Cohen, 1988).

To analyse the results of the study the PROCESS macro v3.3 (Hayes, 2013) was used to carry out a moderation analysis with a significance level of $p < .05$. The independent (X) variable in the moderation was procrastination, the dependent (Y) variable was happiness score and the moderator (W) variable was psychological flexibility. Missing data was pro-rated where possible using standard protocol. This involved taking the average response of the nine responses that had been answered in the sub-scale to produce a value for the missing 10th response. Where pro-rating was not possible, the participants' data were removed.

Results

Descriptive statistics

Scores on happiness, procrastination and psychological flexibility scales were recorded for 124 participants. Due to missing answers, 14 participants' data had to be removed from the analysis, whilst three participants were pro-rated to retain their answers. The remaining 110 participants had an age range of 18 to 42 ($M = 21.17$, $SD = 4.06$). The genders of the participants were female = 96, male = 12; with two participants preferring not to say. There were 102 undergraduates, seven

postgraduates and one participant who did not give their level of study. An analysis was carried out using SPSS v25 and the descriptive results are shown in Table 1 below, all were normally distributed.

Table 1

Means, standard deviations, minimum and maximum scores on each scale (N = 110)

	Scores on each scale (measurement)		
	Happiness (OHQ)	Procrastination (PASS)	Psychological flexibility (CompACT)
<i>Mean</i>	30.15	38.11	75.66
<i>SD</i>	7.63	7.32	21.20
<i>Minimum</i>	13	21	23
<i>Maximum</i>	48	60	124

Inferential statistics

In order to test the first hypothesis of the current study, a Pearson's correlation was carried out. This indicated that, as expected, there was a significant inverse correlation between procrastination and psychological flexibility, $r(110) = -.52$, $p < .001$.

In order to test the second hypothesis of the current study, a moderation analysis was carried out using the PROCESS macro v3.3 (Hayes, 2013) in SPSS v25. This tested the hypothesis that the relationship between procrastination and happiness would be moderated by psychological flexibility. To avoid multicollinearity issues, psychological flexibility and procrastination were mean centred prior to analysis and an interaction term between psychological flexibility and procrastination was produced. The results of the moderation analysis are shown in Table 2 below. The values in Table 2 are given to three decimal places in order to best present the beta values in the model.

Table 2
Linear model of predictors of happiness (N=110)

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Constant	29.839 [28.855, 30.824]	0.497	60.082	$p < .001$
Psychological flexibility (centred)	0.255 [0.206, 0.305]	0.025	10.247	$p < .001$
Procrastination (centred)	-0.141 [-0.284, 0.002]	0.072	-1.958	$p = 0.053$
Psychological flexibility x Procrastination	-0.004 [-0.009, 0.002]	0.003	-1.436	$p = 0.154$

Note. $R^2 = 0.64$

The second hypothesis is not supported by the results of the moderation analysis. For those who had a low psychological flexibility score, there is no relationship between procrastination and happiness, $b = -.06$, $t(106) = -.66$, $p = .5130$. For those who had an average psychological flexibility score, there is no relationship between procrastination and happiness, $b = -.14$, $t(106) = -1.96$, $p = .0529$. For those who had a high psychological flexibility score, for every unit increase in procrastination, happiness score decreases by 2.33 points, $b = -.22$, $t(106) = -2.33$, $p = .0219$. The simple slopes analysis is presented graphically in Figure 1 below.

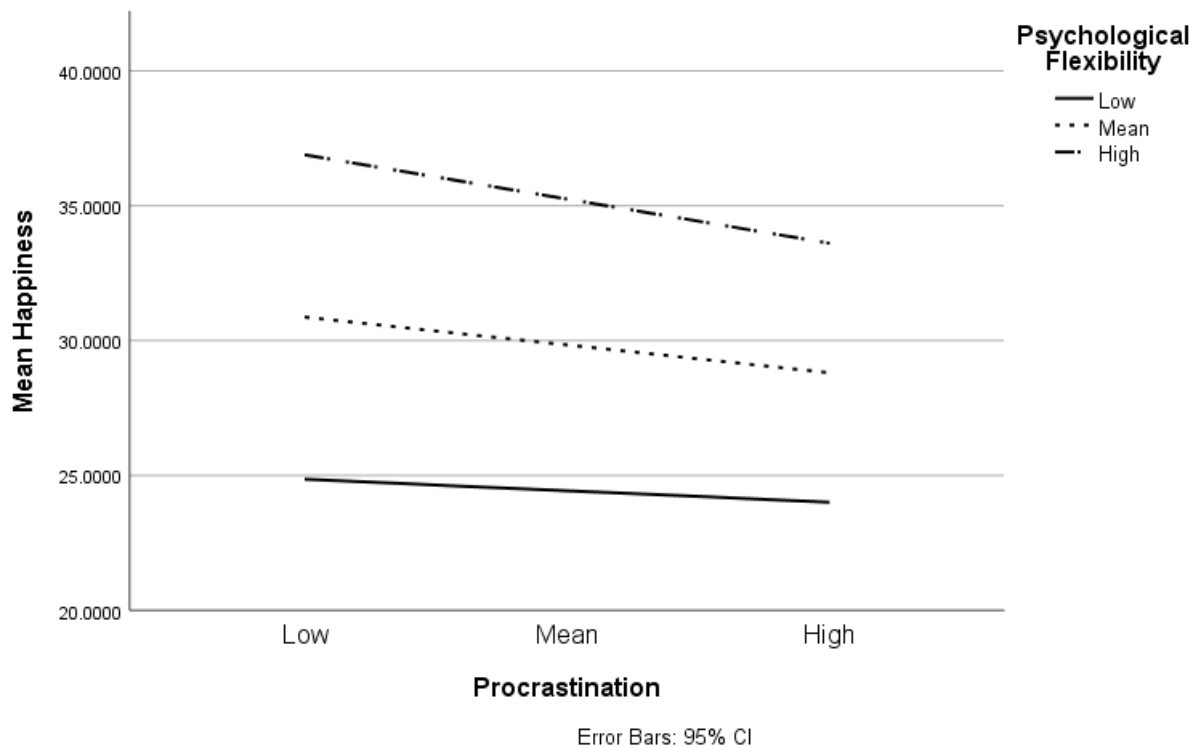


Figure 1: Simple slopes equations of the regression of happiness on procrastination at three levels of psychological flexibility

At a score of psychological flexibility of at least 76, procrastination and happiness are significantly related, $t(106) = -1.98$, $p = .05$, $b = -.14$. As level of psychological flexibility increases, the relationship between procrastination and happiness becomes more and more negative. This relationship is strongest at the highest psychological flexibility score of 124, $b = -.33$, $t(106) = -2.12$, $p = .0363$.

Discussion

The current study found that people who are highly psychologically flexible are less likely to engage in procrastination. It was found that when highly psychologically flexible people do engage in procrastination they experience very low levels of happiness, suggesting that a threshold effect may be in operation. These findings will be discussed in relation to the hypotheses previously outlined which were developed based on current research in the area. However, it must be considered that the current study is the first to assess psychological flexibility as a moderator in the relationship between procrastination and happiness. As well as this, the current study is also the first to consider happiness specifically in the context of procrastination and psychological flexibility. As such, these discussions are limited in relation to the current research in the area.

In testing the first hypothesis of the current study it was found that, as expected, there was a significant strong (Cohen, 1988) inverse correlation between procrastination and psychological flexibility. However, in testing the second hypothesis the expected findings were not found. It was expected that at low levels of

psychological flexibility, higher levels of procrastination would lead to lower happiness scores. However, no relationship was found. It was also expected that at high levels of psychological flexibility, there would not be such a negative effect of procrastination on happiness scores. However, the opposite has been found. There was a significant inverse relationship between procrastination and happiness when psychological flexibility was high. At high levels of psychological flexibility, as procrastination increases, happiness levels decrease. The biggest decreases in happiness levels were seen at the highest levels of procrastination. Nevertheless, although the expected findings were not found, it must be considered that the findings of the current study in relation to the second hypothesis may be explained by a threshold effect. It can be seen from the literature discussed thus far that psychological suffering can cause people to procrastinate and that people who are highly psychologically flexible are less likely to procrastinate. As such, if people who are highly psychologically flexible are procrastinating this suggests that they are especially unhappy, thus supporting the notion of a threshold effect.

As mentioned, there are only six studies that have been carried out thus far that specifically look at processes related to Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson, 1999) and procrastination. Their results will now be discussed in relation to the current study, predominantly in relation to the first hypothesis. Firstly, Sirois and Tosti (2012) used a general measure of procrastination, however, their participants were students and answered the questions in the context of academic tasks. It must also be considered that whilst their focus, mindfulness, is a part of psychological flexibility, it is also its own construct and skill. Nevertheless, the most relevant parts of Sirois and Tosti's (2012) study are supported by the findings of the current study, they found a weak (Cohen, 1988) inverse correlation between procrastination and mindfulness. As such, the mindfulness aspect of psychological flexibility is suggested to be important in its relationship with procrastination, even without the rest of the aspects.

Glick, Millstein and Orsillo (2014) found that there was a weak (Cohen, 1988) inverse relationship between psychological flexibility (measured using the Acceptance and Action Questionnaire; AAQ; Hayes, Luoma, Bond, Masuda & Lillis, 2006) and procrastination (measured using the PASS; Solomon & Rothblum, 1984) in the first part of their study. They also found that there was a moderate (Cohen, 1988) inverse relationship between psychological flexibility (measured using the AAQ-II; Bond et al., 2011) and procrastination (measured using the PASS) in the second part of their study. As examined previously, the AAQ-II is not as strong a measure of psychological flexibility (as discussed by Wolgast, 2014) as the Comprehensive assessment of Acceptance and Commitment Therapy processes (CompACT; Francis, Dawson & Golijani-Moghaddam, 2016). Nevertheless, the AAQ-II is an improvement upon the AAQ and as such the increase in strength of the relationship between psychological flexibility and procrastination that can be seen here is supported by the findings of the current study. When more accurate measures of psychological flexibility are used it seems that the inverse relationship between psychological flexibility and procrastination strengthens.

Scent and Boes' (2014) study also used the AAQ-II (Bond et al., 2011) to measure psychological flexibility before and after ACT-based intervention workshops. As a response to the limitations of the AAQ-II, Scent and Boes (2014) also used a measure of experiential avoidance, which is also referred to as psychological inflexibility (Bond et al., 2011). Similar to the current study, Scent and Boes (2014)

used the PASS to assess academic procrastination. Although the statistical results of the intervention were not made available, it was stated that there was an inconsistent link between high procrastination and low psychological flexibility. This is a very different finding to what has been found by both the current study and by the other studies discussed in this area. This could be explained by the very small sample size in Scent and Boes' (2014) study; only six participants attended both workshops, with an additional two participants only attending the first workshop. Nevertheless, it was found that psychological flexibility increased for all participants in the intervention in the time period of just one week and participants anecdotally reported that they had procrastinated less. Although this study began to teach ACT-based skills to improve psychological flexibility, the researchers acknowledged that the intervention did not fully teach all aspects of psychological flexibility in the ACT Hexaflex model (this model is described in Harris, 2009). As the first longitudinal study, albeit with a short period between the measures and with a very small sample size, it supports the potential aim of increasing psychological flexibility as an intervention to lower procrastination.

Glick and Orsillo's (2015) intervention study found that there was a moderate (Cohen, 1988) inverse relationship between procrastination and psychological flexibility, which is supported by the findings of the current study. Their study, like many in the area, used the AAQ-II (Bond et al., 2011) and included a measure of academic values. They found that values were especially important and were a good predictor of success in reducing procrastination in the Acceptance-Based Behavioural Therapy condition. The current study, in using the CompACT scale (Francis et al., 2016), considers values without requiring an additional scale. Glick and Orsillo (2015) did not find that either intervention succeeded in reducing the procrastination levels of its participants. However, it is likely that a 20-minute intervention was insufficient to fully teach the ACT processes to the participants and for them to properly engage with their values.

Gagnon, Dionne and Pychyl's (2016) study chose to assess committed action specifically and psychological flexibility more broadly. Like many of the studies discussed thus far, Gagnon and colleagues (2016) used the AAQ-II (Bond et al., 2011) as well as measures of cognitive fusion, mindfulness and committed action. Ultimately, Gagnon and colleagues (2016) found that there was a moderate (Cohen, 1988) inverse relationship between procrastination and psychological flexibility, which is again supported by the findings of the current study. This is the only study which considered psychological well-being (although just as a control variable) and Gagnon and colleagues (2016) found that there was a moderate (Cohen, 1988) inverse relationship between procrastination and psychological well-being, measured using the Depression, Anxiety and Stress Scales – Short Form (DASS-21; Henry & Crawford, 2005), as was expected in the current study. The current study did not look at this relationship specifically, however, overall it appeared that those who procrastinated did generally have lower levels of happiness. These differences could be explained by Gagnon and colleagues' (2016) use of the DASS-21 (Henry & Crawford, 2005), a more clinical measure of psychological well-being than the Oxford Happiness Questionnaire – Short Form (OHQSF; Hills & Argyle, 2002) used in the current study. Nevertheless, due to the differences in what was being assessed, this finding can only be considered lightly in relation to the findings of the current study. Overall, their findings support the theoretical assumption that procrastination can be operationalised as being very similar to lack of committed action. It also provides

support for the strength of the current study in using the CompACT (Francis et al., 2016) as a better measure of all of the processes that make up psychological flexibility.

Wang and colleagues' (2017) intervention used another academic procrastination scale, which was very similar to the PASS (Solomon & Rothblum, 1984). They found that both the ACT and the CBT participants experienced a decrease in procrastination. Although Wang and colleagues (2017) used ACT protocols in this intervention, they did not specifically measure changes in psychological flexibility. As such the findings of the current study cannot closely be compared to their findings, however, they did find that procrastination decreased in ACT participants and stayed at a lower level at the three month follow up compared to the CBT participants (Wang et al., 2017). There were eight, weekly 180-minute sessions for each intervention group which supports the suggestion that these skills have more long-lasting benefit when taught in longer sessions across many weeks.

In summary, the studies discussed thus far have looked at similar issues to the first hypothesis of the current study. Four of the above five comparable studies found an inverse correlation between procrastination and psychological flexibility, as was found in the current study. The only study that did not find the same reliable correlation was Scent and Boes' (2014) intervention study. As discussed, this is likely to be explained by the very small sample size used. As such, on review of the evidence and the findings of the current study, it is likely that there is an inverse correlation between procrastination and psychological flexibility. The strength of this relationship appears to be affected mostly by the measurement of psychological flexibility used.

The second hypothesis of the current study can only be partially discussed in the context of the current research in the area. There have been no other studies which have considered happiness in investigations into the relationship between procrastination and psychological flexibility. As such, it is difficult to discuss this aspect. Nevertheless, it is possible to consider the findings regarding the second hypothesis of the current study in the light of the theoretical work that has been published in the area thus far. As discussed in the introduction, procrastination has been defined as consciously delaying essential tasks, with the knowledge that the outcome will be more negative (Steel, 2007). In light of this, research has operationalised procrastination as a form of self-regulation failure (Sirois & Pychyl, 2013) which prioritises the present self over the future self (Sirois, 2014; Stöber & Joorman, 2001) and values (Hayes et al., 2004). This prioritisation, as well as the considerations of the importance mostly of conscientiousness (Kim, Fernandez & Terrier, 2016) and in some cases neuroticism (Wang et al., 2017), over the other three personality traits (openness to experience, extraversion and agreeableness; McCrae & Costa, 1987), show the importance of considering procrastination as an inability to cope with the negative emotions associated with the completion of important tasks. Although there are individual differences in every person's display of procrastination, based on the different levels and contributions of each of the five personality traits (Steel & Klingsieck, 2016), overall this could be described as an inability to cope with self-critical thoughts, which is a lack of skill in the area of mindfulness (Sirois & Tosti, 2012). This is further supported by the findings of an experimental study which found that when participants thought that their bad mood was unchangeable, they procrastinated less (Tice, Bratslavsky & Baumeister, 2001), showing the non-judgemental acceptance of emotions required to be skilled at mindfulness (Sirois & Tosti, 2012).

As such, the importance of skills that can be thought of as psychological flexibility, despite the possibility that they were not thought of as such at the time, is clear. Tice and Baumeister (1997) found that non-procrastinators experience lower levels of psychological well-being from the beginning of the academic term, as they are experiencing worry for a more prolonged period of time. This further supports the notion of more psychologically flexible people being able to cope with the negative emotions at a lower level throughout the year, in order to keep on top of their academic tasks. Whereas, procrastinators are happier when a deadline is far away and they are not worried about it; they show better psychological well-being early on in the year, when they are better able to psychologically distance themselves from academic tasks. However, when the deadline approaches, they show much worse psychological well-being and are also less likely to seek help for this (Stead, Shanahan & Neufeld, 2010). Additionally, these processes are important in understanding the dysfunctional delay behaviour of procrastination (as defined by Steel, 2010). This further supports the necessity of longitudinal studies being prioritised in future research, as psychological well-being varies depending on deadlines.

One other area of research that should be considered in the context of the findings of the current study is that of motivation and goal setting. There are two main theories in this area which are goal setting theory (Gröpel & Steel, 2008) and Temporal Motivation Theory (TMT; Steel, Svartdal, Thundiyil & Brothen, 2018). As discussed, TMT better considers what is referred to as the intention-action gap, an important consideration in procrastination and psychological flexibility. Those who are able to cope with negative emotions are more likely to be able to persevere with their intentions and complete the required actions in a timely manner, thus prioritising their future self over their present self (Sirois, 2014; Stöber & Joorman, 2001). From the findings of the current study it is likely that those high in procrastination and high in psychological flexibility are extremely unhappy as they are no longer coping with their responsibilities. As such, it is easy to see what a negative effect this can quickly start to have on their overall psychological well-being (Blackledge & Hayes, 2001; Bond et al., 2011).

One issue in the area of procrastination is the lack of both an accepted theory and an accepted direction of the relationship between procrastination and mental health conditions. Some studies have found that procrastination leads to mental health problems such as anxiety and depression (e.g., Flett, Haghbin & Pychyl, 2016), whilst others have found that anxiety and depression lead to procrastination (e.g., Constantin, English & Mazmanian, 2017), whilst still others have suggested that it may be a bi-directional relationship (e.g., Aftab, Klibert, Holtzman, Qadeer & Aftab, 2017). The accepted directionality of the relationship affects the investigations that can be done in the area. Although it is clear that more moderating and mediating relationships would be useful, it is more difficult to carry these out when the directionality is unclear. Nevertheless, it is clear from the research thus far that the two are correlated and interventions are needed, which is supported by the findings of the current study, namely that procrastination overall caused happiness levels to be lower.

The broader implications of the findings of the current study were proposed to support the justification of ACT-based interventions for students in order to both decrease levels of procrastination as well as increase levels of psychological flexibility and ultimately to improve happiness levels. Although the findings are limited in some areas, the investigation of ACT-based interventions is still likely to be worthwhile due to the need for a well-rounded intervention to cover the many different manifestations

of procrastination behaviour. This is supported by the finding that at high levels of psychological flexibility, as procrastination increases, happiness levels decrease. From the discussion so far it is likely that this can be explained by a threshold effect, which further supports the notion that this relationship is worthy of further investigation.

In spite of the successes of the current study, there are some limitations that should be considered. The findings of the current study are cross-sectional, correlational data. This data, although limited in its explanation of the underlying processes involved in the relationships discussed, is nevertheless appropriate in this early stage. Experimental data at this time point would not be viable; future research instead would benefit from a longitudinal design, in order to be able to properly assess the relationships at different time points in the year. Although the current study involved students in each year of undergraduate study, as well as postgraduate students, all of the data was collected between December and February. This limits the ability of the findings to provide a true picture of students' well-being across the academic year, alongside various deadlines.

Further to the above limitation is the reliance on self-report data. For the three scales used; the OHQSF (Hills & Argyle, 2002), the PASS (Solomon & Rothblum, 1984) and the CompACT (Francis et al., 2016); it is worth considering that there may be other methods of measuring happiness, procrastination and psychological flexibility respectively. As in Glick and Orsillo's (2015) study, the use of behavioural measures lend further support for assessing frequency of procrastination, rather than relying on participants providing a true picture of this behaviour. For example, implicit measures may be useful in this situation.

Finally, due to the findings of the current study and the proposal of a threshold effect being relevant in the relationship between procrastination and happiness at different levels of psychological flexibility, it should be considered that an alternative measure of happiness, or more accurately in this situation, of psychological well-being, may be needed. For example, the DASS-21 (Henry & Crawford, 2005) was not a viable option in the current study due to ethical limitations, however, in future studies it may provide a better assessment of well-being at high levels of psychological flexibility.

Future research in this area could use the same or similar measures of procrastination, happiness and psychological flexibility to carry out a longitudinal rather than cross-sectional study. One of the strengths of the current study is that it does not take a long time to complete and will not cause participant fatigue. As such, more completions of the scales at regular time points throughout the academic year will be viable. As discussed, a longitudinal design will allow for further moderation and mediation models to be tested (as suggested by Glick, Millstein & Orsillo, 2014) to further understand the intricacies of the three constructs in the relationship. Happiness levels in particular should be assessed regularly throughout the year and the current demands on the student with regards to coursework deadlines or approaching exams should be recorded. If appropriate, the use of the DASS-21 (Henry & Crawford, 2005) may provide a better assessment of happiness levels and improve the design of the study to allow for better data to fully assess the role of psychological flexibility in procrastination's relationship with happiness. The other particular strength of the current study is the use of the CompACT scale (Francis et al., 2016). Based on the findings of the current study the CompACT appears to be a better measure of psychological flexibility than the AAQ (Hayes et al., 2006; as measured in the study by Glick, Millstein & Orsillo, 2014) and the AAQ-II (Bond et al., 2011; as measured in

the studies by Gagnon, Dionne & Pychyl, 2016; Glick, Millstein & Orsillo, 2014; Glick & Orsillo, 2015; Scent & Boes, 2014). Finally, as the first study to consider happiness levels in the investigation into the interaction of academic procrastination and psychological flexibility, it is clear that this is an area that should be considered by future researchers.

Conclusion

In conclusion, the current study was the first to investigate the moderation effect that psychological flexibility has on the relationship between academic procrastination and happiness levels. As such, it is not possible to compare the findings to other research in the area as this does not yet exist. Nevertheless, the hypothesis of the current study was rooted in the current literature and as such has led to the proposal of a threshold effect being in operation in this relationship. Specifically, it is proposed that the theoretical underpinnings of both procrastination and psychological flexibility lend themselves to the conceptualisation of procrastination being a result of low psychological flexibility, meaning that people cannot cope with negative feelings associated with task completion and as such will avoid completing the task. However, when people are psychologically flexible, they will cope with the negative feelings, persevere with the task and avoid procrastination. As such, when someone who is psychologically flexible is procrastinating it is highly likely that they are experiencing extremely low levels of happiness and it is only at these truly low levels that they will partake in such avoidant behaviours. To further investigate this relationship, it is strongly recommended that longitudinal designs are used to measure procrastination, psychological flexibility and happiness at different time points during the academic year; as this will provide a more accurate representation of the relationship.

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