

RESEARCH ARTICLE

The relationship between procrastination and sexual orientation

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0:0 Abstract

Procrastination can lead to reduced mental well-being and life satisfaction. In this study, levels of procrastination were examined as a function of sexual orientation using a correlational design. Through an internet survey, a sample of 437 participants completed the Pure Procrastination Scale, the conscientiousness related items of the International Personality Item Pool, and an adapted version of the Rasch Derived Centre for Epidemiological Studies Depression Scale-Short Form. Participants were divided into one of four groups based on their gender and sexual orientation. Procrastination scores were higher for heterosexual men compared to heterosexual women ($r=.142$). Non heterosexual women were found to procrastinate more than heterosexual women ($r=.162$). Both relationships were mediated by conscientiousness, but not depression. Results suggest that certain sexual orientation groups may be more vulnerable to procrastination and this has implications for their well-being, which raises further awareness of issues pertinent to disparity in health equity.

Key words: procrastination, gender, sexuality, depression, conscientiousness

1:0 Introduction

Procrastination is a common self-regulatory failure defined as a voluntary delay of an intended course of action despite foreseeable negative consequences of the delay (Wilson & Nguyen, 2012; Rozental & Carlbring, 2014). Many studies have dem-

onstrated the adverse consequences of procrastination in various areas of wellbeing. For example, a recent study examining the relationship between procrastination and mental health found significant correlations between a general procrastination measure and measures of mental health, cognitive functioning and

social desirability (Stead, Shanahan & Neufeld, 2010). It has been found that chronic procrastinators expressed more life regrets than non-procrastinators in areas including education, parenting, family and friend interactions, health and wellness, and financial decisions (Ferrari, Barnes & Steel, 2009).

The 'Big Five' personality trait model characterizes human personality based on 5 broad dimensions termed Openness to experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism (abbreviated OCEAN; Cooper, 2006). The Big Five model is commonly used to explore individual differences in personality through one of these five main traits or their facets (Weisberg, DeYoung, & Hirsh, 2011). Conscientiousness is a trait related to dutifulness, self-discipline, orderliness, self-efficacy, achievement striving and cautiousness (Maples, Guan, Carter & Miller, 2014). A large-scale meta-analysis analysed correlations using data from over 200 separate sources to find good predictors of procrastination (Steel, 2007). The findings highlighted several strong and consistent predictors of procrastination, such as lack of self-efficacy (a component of conscientiousness) and impulsiveness, which is associated with both extraversion and neuroticism. In addition, primary traits associated with conscientiousness such as distractibility, self-control, organization, and achievement motivation were strong predictors of procrastination. When each of the Big Five factors was examined as a whole, conscientiousness was the strongest predictor with an average correlation coefficient of $r=-.65$ between measures of conscientiousness and procrastination.

When looking at mental health and procrastination, depression is one of the most studied, where consistent positive corre-

lations have been established (Martin, Flett, Hewitt, Krames & Szanto, 1996; Beswick, Rothblum & Mann, 1988; Sandler & Sacks, 1993). The correlation between procrastination and depression has been assessed in the aforementioned 2007 meta-analysis, using data on over 10,700 participants, and the correlation coefficient was $r=0.28$ (95% CI 0.26-0.31; Steel, 2007). The cause of the relationship between depression and procrastination is unclear. It has been suggested that peaks of negative affect in sufferers of depression may lead to the increase in procrastination (Uzun Ozer, O'Callaghan, Bokszczanin, Ederer, & Essau, 2014). Additionally, while procrastination may improve mood in the short run by avoidance of aversive tasks, the consequences of task delay decrease mood in the long run, creating a depression spiral (Lindsley, Brass, & Thomas, 1995).

Interest in the relationship between sexual orientation and personality arose from observations that the personalities of some homosexual men appear more feminine, and some homosexual women more masculine, than their heterosexual counterparts (Pillard, 1991). The hypothesis predicting such average differences was termed 'sexual inversion'. To test this hypothesis, studies examined differences in traits that were known to vary between men and women, such as assertiveness and dominance, associated with masculinity, as well as compassion and nurturance, associated with femininity (Pillard, 1991). A narrative review of these earlier studies has found differences in these traits between homosexual and heterosexual participants that provide support to the hypothesis (Pillard, 1991; Lippa, 2005). However, this viewpoint is somewhat outdated and runs the risk of perpetuating outdated stereotypes. Later methodologies have turned to wider models of personality

to examine homosexual-heterosexual differences. A meta-analysis published in 2005 reviewed four studies that compared scores of over 6400 participants in measures of the Big Five personality traits (Lippa, 2005). The analysis distinguished four groups, heterosexual men and women, and homosexual men and women. A small (raw effect size $g=-.17$) yet significant difference in conscientiousness was found between heterosexual men and women, indicating that women have somewhat higher levels of conscientiousness on average (Weisberg, DeYoung & Hirsh, 2011). A larger (raw effect size $g=-.35$) and significant difference was found between heterosexual and homosexual men, suggesting that homosexual men have higher levels of conscientiousness on average. However, no significant difference was found between heterosexual and homosexual women with regard to conscientiousness.

The prevalence of mental health disorders among homosexual and bisexual individuals is generally believed to be higher than in the general population (Gilman *et al.*, 2001). A meta-analysis published in 2008 reviewed 25 studies related to the prevalence of mental health problems in homosexual or bisexual populations compared to heterosexuals (King *et al.*, 2008). Data was gathered from over 225,000 participants revealed that the risk for suicide attempts in non-heterosexuals was twice as high as in heterosexuals. The risk for depression and anxiety disorders, as well as substance dependence, was at least 1.5 times higher in non-heterosexuals. Similarly, a study published in 2011 examined this trend in a UK based population and found non-heterosexuals had an increased risk for depression, generalized anxiety disorder, obsessive-compulsive disorder, suicidal thoughts and substance dependence (Chak-

raborty, McManus, Brugha, Bebbington & King, 2011).

The current study employed a correlational design to investigate the relationship between sexual orientation and procrastination behaviour. The hypothesis was loosely based on the sexual inversion hypothesis, as well as studies which have looked at procrastination among men and women (e.g. Lippa, 2005; Weisberg *et al.*, 2011). It was predicted that levels of procrastination might vary between gender and sexuality, it was the possible mediation of this relationship by conscientiousness and level of depression.

To expand, conscientiousness has been shown to be higher in homosexual men than heterosexual men ($g=0.35$; Lippa, 2005), and strongly predicts lower levels of procrastination ($r= -.65$; Steel, 2007). However, levels of depression, that are higher in non-heterosexuals, are negatively correlated with procrastination ($r=0.28$). Therefore, it was hypothesized that homosexual men would procrastinate less than heterosexual men, and vice versa for women. Conscientiousness was also predicted to mediate the relationship between procrastination and sexual orientation in men, while depression was predicted to moderate the effect. While no significant difference in conscientiousness has been demonstrated in research between homosexual and heterosexual women, a higher level of depression is found in non-heterosexual women. Therefore, it was hypothesized that depression will mediate the relationship between procrastination and sexual orientation in females. There appears to be limited research on whether levels of procrastination vary with sexual orientation and heterosexual groups. Mental health among gay and lesbian groups appears higher than heterosexual groups, where

procrastination has been associated with depression and compromised self-efficacy (e.g. Ferrari, Barnes & Steel, 2009). The results might enable better evaluation of the risk for procrastination in different groups. Substantiating a difference in procrastination between populations of different sexual orientations may also lead to additional research on the roots of such differences, which could assist with understanding the underpinnings of the phenomenon. Further, having a better understanding of whether procrastination varies among different sexual orientation groups will augment the development of gender and sexuality specific healthcare interventions.

2:0 Method

2:1 Design

The current study employed a cross-sectional, correlational design to investigate the relationship between sexual orientation and procrastination behaviour. The study also examined the possible mediation of this relationship by conscientiousness and depression. Convenience sampling was used to enable comparison between the different groups of sexual orientation. For sexual orientation, each of the genders was divided into groups of sexual orientation. Analyses were conducted comparing heterosexual to non-heterosexual, as well as heterosexual, bisexual and homosexual groups.

2:2 Participants

437 men (40.3%) and women (59.7%) completed an online survey via survey monkey. Recruitment was through advertisements placed on websites dedicated to participant recruitment for academic studies: www.callforparticipants.com, and

www.onlinepsychresearch.co.uk, as well as social media groups on Facebook: Psychology Experiments, and Survey Sharing. A link to the survey was posted along with a short description and the inclusion and exclusion criteria. Once participant recruitment was completed, the links were removed from these websites.

2:3 Measures

Pure Procrastination Scale (PPS; Steel, 2010). The PPS is a 12-item questionnaire designed to measure procrastination behavior. All items are rated on a 5-point Likert scale to indicate the degree to which participants identify with the statements presented. The questionnaire is composed of items from previous widely used procrastination scales, selected through factor analysis in a study with over 4,000 participants. This questionnaire was referred to as 'pure' since items address the actual act of procrastination, making it a more specific measure. This measure has high reliability, with a Cronbach's alpha of 0.92. Validity was supported by inclusion of several measures of procrastination in the factor analysis, and convergence of the PPS with other related scales.

International Personality Item Pool – 120 (IPIP-120; Maples, Guan, Carter & Miller, 2014). The IPIP-120 is a 120-item self-report measure of the big 5 personality factors (including conscientiousness). Each factor is assessed by 24 items rated on a 5-point Likert scale. Each factor is divided to 6 facets, assessed by 4 questions each. The IPIP-120 was developed as part of a study that tested another widely used 300-item big-5 personality questionnaire (The IPIP-NEO) and compared it to an established inventory (NEO PI-R). High reliability was demonstrated in these studies with a Cronbach's alpha of .89 and .84,

respectively. This measure was used since it provides a reliable estimation of conscientiousness, with fewer items than other commonly used personality questionnaires.

Assessing depression was closely modelled on The Rasch-Derived Centre for Epidemiological Studies Depression Scale – Short Form (Cole, Rabin, Smith & Kaufman, 2004). This is a 10-item 4-point Likert measure and provides a quick assessment level of depression. This scale was developed as a tool for screening depression in the general population. The Cronbach's alpha was 0.82 and 0.75. Its validity was estimated by having participants complete the short form along with the full 20-item scale from which it was derived, as well as the Beck Depression Inventory, a widely used measure of depression. Correlations between these measures were high, 0.73 for the CES-D 20-item scale and 0.74 for Beck's Depression Inventory, supporting the scale's validity.

Assessing sexual orientation was closely modelled on the, 'Measure of Sexual Orientation' (Safren & Heimberg, 1999). The Measure of Sexual Orientation includes one item rated on a 5-point scale. Participants rate themselves either exclusively heterosexual, heterosexual with some homosexual experience, bisexual, homosexual with some heterosexual experience, or exclusively homosexual.

2:4 Procedure

Ethical permission was obtained via the Institutional Review Board. A computerized survey was prepared using Survey

Monkey and Google Forms (two equivalent versions were used). The first page of the survey was an information and consent page that participants were required to read and agree to prior to participation. The information sheet included information about the study and researchers and possible risks of participation. Participants were informed that their participation was voluntary and that they could withdraw their participation at any time. After providing consent, participants completed a demographics section (only gender, sexual orientation and age were mandatory), the 12-item PPS, the 24 conscientious related items of the IPIP-120, and the 'modelled' 10-item depression scale. This was followed with a debriefing form which included a list of organizations to provide additional support.

3:0 Results

3:1 Sample Characteristics

437 participants contributed to this study. 261 participants were women (59.7%), and 176 were men (40.3%). The mean age of the sample was 25.95 (SD=10.15), and it ranged between 18 and 66. Age was unevenly distributed, with over half of the participants 22 years old or younger. Of male participants, 51.1% reported to be exclusively heterosexual (straight), 31.8% exclusively homosexual (gay), 6.8% mostly homosexual, 5.1% mostly heterosexual, and 5.1% bisexual. Of female participants, 70.1% reported to be exclusively heterosexual (straight), 11.5% mostly heterosexual, 10.7% bisexual, 5.7% exclusively homosexual (gay), and 1.9% mostly homosexual.

Table 1. Sexual orientation

Group	Males		Females		Total
	<i>n</i>	%	<i>n</i>	%	
Exclusively heterosexual	90	51	183	70	Total heterosexual <i>n</i> =273, 62.5%
Mostly heterosexual	9	5	30	12	Total non-heterosexual <i>n</i> =164, 37.5%
Bisexual	9	5	28	11	
Mostly homosexual	12	7	5	2	
Exclusively homosexual	56	32	15	6	
Total	176	100	261	100	<i>n</i> =437, 100%

For comparability purposes, questionnaire scores were converted to a 0 to 1 scale. This was achieved by deducting the minimal possible score from the actual score, then dividing by the range of possible scores (Kolen, Tong, & Brennan, 2009). Using this scaling method, 0 is the lowest possible score in a questionnaire, while 1 is the highest. The mean score for procrastination was .47 (*SD*=.23), for conscientiousness .67 (*SD*=.13), and for depression .38 (*SD*=.21). The range for procrastination and depression was 1, meaning that participants rated

themselves throughout the spectrum of possible scores. On the other hand, the range of scores for conscientiousness was .67, from .33 to 1, and no participants rated themselves within the bottom third of possible scores. Internal consistency reliability estimates for all three questionnaires were high, with Cronbach's alphas of 0.917 for the procrastination scale, 0.875 for the conscientiousness scale, and 0.859 for the depression scale (Field, 2009). Significant correlations were found between all three variables (see table 2).

Table 2. Correlations between continuous variables.

Variable 1	Variable 2	<i>R</i>
Procrastination	Conscientiousness	-.715**
Procrastination	Depression	.358**
Conscientiousness	Depression	-.404**

** All correlations were significant at a $p < .001$

3:2 Procrastination, Gender & Sexual Orientation

The mean procrastination score of heterosexual women was the lowest ($M=.43$, $SD=.22$), followed by non-heterosexual men ($M=.47$, $SD=.25$),

heterosexual men ($M=.50$, $SD=.23$), and non-heterosexual women ($M=.50$, $SD=.21$; See table 3). An analysis of variance revealed that these between group differences were statistically significant ($F(3,433)=2.99$, $p<.05$).

Table 3. Means and standard deviations of continuous variables

Sexual Orientation	Gender	Procrastination		Conscientiousness		Depression	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Exclusively heterosexual	Men	.50	.23	.66	.13	.33	.19
	Women	.43	.21	.70	.13	.36	.21
Non-heterosexual	Men	.47	.25	.67	.13	.43	.24
	Women	.51	.21	.64	.13	.44	.21

Procrastination and Gender. In order to determine which of the comparisons led to the significance of the analysis of variance, multiple t-tests were conducted. The first comparison conducted was between heterosexual men and women. The hypothesis examined in this study relies on the existence of a difference in procrastination between these groups, as reported in previous studies (Steel & Ferrari, 2012). It is the basis for the predictions made regarding the non-heterosexual groups. When examining procrastination in heterosexual men ($M=.43$, $SD=.02$), compared to heterosexual females ($M=.50$, $SD=.23$) a statistically significant difference is observed ($t(271)=2.37$, $p<.016$, $r=.142$, $d=0.30$). When procrastination is compared between all men ($M=.49$, $SD=.24$) and women ($M=.45$, $SD=.22$) (including the non-heterosexual participants), the difference is not statistically significant.

A mediation analysis was conducted in order to ascertain whether any of the recorded variables could mediate this effect. A series of χ^2 tests revealed no significant differences between heterosexual men and women in the possible categorical mediators: marital status, occupation, education, and ethnicity. Correlations between gender and the continuous

variables, conscientiousness, depression and age, were examined in order to detect possible continuous mediators (Frazier, Tix, & Barron, 2004). Significant correlations were calculated between gender and conscientiousness ($r(271)=-.141$, $p<.05$), as well as gender and age ($r(271)=.137$, $p<.05$). The PROCESS plugin for SPSS was used to examine the different paths between the variables to determine whether mediation was supported by the data (Hayes, 2013). The regression between gender and procrastination (path c) confirmed the effect previously observed ($F(1,271)=5.61$, $p<.05$, $R^2=.02$; $b=0.068$, $t(271)=2.37$, $p<.05$; See table 4). Regressions between gender and conscientiousness ($F(1,271)=5.47$, $p<.05$, $R^2=.02$, $b=-0.04$, $t(271)=-2.34$, $p<.05$) as well as gender and age ($F(1,271)=5.22$, $p<.05$, $R^2=.02$, $b=2.99$, $t(271)=2.28$, $p<.05$) confirmed the link with the mediators (paths a_x and a_y). The overall model with gender, procrastination and age predicting procrastination was significant ($F(3,269)=88.01$, $p<.05$, $R^2=.495$). Conscientiousness (path b_x) still predicted procrastination ($b=-1.18$, $t(269)=-15.90$, $p<.05$), while gender ($b=0.02$, $t(269)=1.07$, $p=.28$) and age ($b=-0.0005$, $t(269)=-0.51$, $p=.61$) were no longer significant predictors. This confirms mediation of the relationship between gender and procrastination by conscientiousness, but not by age.

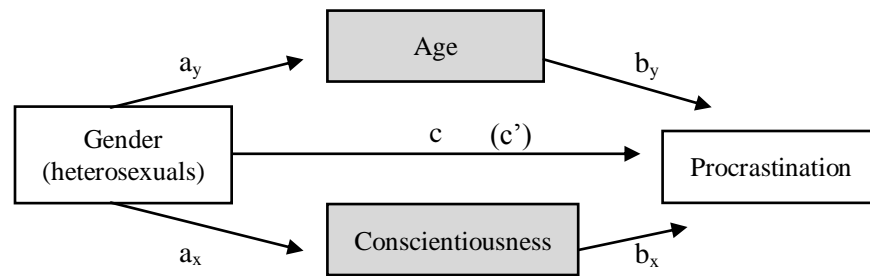


Figure 1. Mediation path model

Female Group. The next comparison was of procrastination scores between heterosexual and non-heterosexual women. The average procrastination score of heterosexuals ($M=.43$, $SD=.21$) was lower than that of non-heterosexuals ($M=.51$, $SD=.21$). The difference in scores observed was statistically significant ($t(259)=2.644$, $p<.016$, $r=.162$, $d=0.36$).

A mediation analysis was conducted for the effect of sexual orientation in women on procrastination. A series of χ^2 tests revealed no significant differences between heterosexual and non-heterosexual women in the possible categorical mediators. Correlations between female sexual orientation and the continuous variables were significant for conscientiousness ($r(259)=-.212$, $p<.05$) and depression ($r(259)=.173$, $p<.05$). A mediation analysis was performed. The regression between female sexual orientation and procrastination (path c) confirmed the relationship ($F(1,259)=6.99$, $p<.05$,

$R^2=.026$; $b=0.076$, $t(259)=2.64$, $p<.05$). Regressions between female sexual orientation and conscientiousness ($F(1,259)=12.15$, $p<.05$, $R^2=.04$, $b=-0.06$, $t(259)=-3.49$, $p<.05$) as well as depression ($F(1,259)=7.96$, $p<.05$, $R^2=.03$, $b=0.08$, $t(259)=2.82$, $p<.05$) confirmed the link with the mediators (paths a_x and a_y). The overall model with female sexual orientation, procrastination and depression predicting procrastination was significant ($F(3,257)=106.44$, $p<.05$, $R^2=.55$). Conscientiousness (path b_x) still predicted procrastination ($b=-1.17$, $t(257)=-15.92$, $p<.05$), while sexual orientation ($b=-0.0015$, $t(257)=-0.076$, $p=.94$) and depression ($b=0.086$, $t(257)=1.88$, $p=.062$) were no longer significant predictors. The results support a strong mediation of the relationship by conscientiousness. While results for mediation by depression did not meet the threshold set by this study for statistical significance, they were very close.

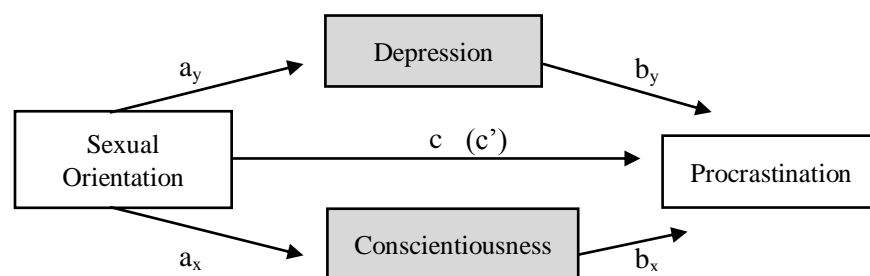


Figure 2. Mediation path model

Male Group. A similar analysis was conducted for male participants. The average procrastination score for exclusively heterosexuals ($M=.50$, $SD=.23$) was slightly higher than the average for non-heterosexuals ($M=.47$, $SD=.25$). However, the differences were small and were not found to be statistically significant.

Out of the 176 males who participated, 90 reported to be exclusively heterosexual (51.1%), 56 completely homosexual (31.8%), 12 mostly homosexual (6.8%), and 9 each mostly heterosexual or bisexual (5.1% each). Group sizes enabled comparisons between exclusively homosexual ($M=.49$, $SD=.24$) and exclusively heterosexual participants, in addition to the comparison between heterosexuals and non-heterosexuals. However, this comparison did not reach the threshold for statistical significance either.

3:3 Conscientiousness and Depression

An analysis of variance was conducted for differences in conscientiousness between heterosexual men ($M=.66$, $SD=.13$) and women ($M=.70$, $SD=.13$) and non-heterosexual men ($M=.65$, $SD=.13$) and women ($M=.64$, $SD=.13$), with significant results ($F(3,433)=5.12$, $p<.05$). Since the assumption of homogeneity of variances was met (*Levene Statistic* (3,433)=0.227, $p=.878$), the Ryan-Einot-Gabriel-Welsch post-hoc test was used for the pairwise comparison (Field, 2009). The results of heterosexual and non-heterosexual men were comparable to each other and to the non-heterosexual women's group, while the heterosexual women constituted a separate category.

An analysis of variance was also performed for differences in depression between

heterosexual men ($M=.33$, $SD=.19$) and women ($M=.36$, $SD=.21$) and non-heterosexual men ($M=.43$, $SD=.24$) and women ($M=.44$, $SD=.21$), with significant results ($F(3,433)=6.10$, $p<.05$). Since the assumption of homogeneity of variances was met (*Levene Statistic* (3,433)=2.05, $p=.106$), the Ryan-Einot-Gabriel-Welsch post-hoc test was used for the pairwise comparison (Field, 2009). Results distinguished two groups of levels of depression, heterosexual and non-heterosexual. Therefore, the non-heterosexual group had significantly higher levels of depression than the heterosexual group (Chakraborty, McManus, Brugha, Bebbington & King, 2011).

4:0 Discussion

This study looked at the relationship between sexual orientation and procrastination as well as examining the possible mediating factors of this relationship. Based 'loosely' on the sexual inversion hypothesis and prior studies demonstrating differences between men and women in procrastination (e.g. Pillard, 1991; Weisberg, DeYoung & Hirsh, 2011), this study hypothesized that homosexual men would procrastinate less than heterosexual men, and vice versa for women.

These hypotheses were partly supported by results where non-heterosexual women reported higher levels of procrastination than heterosexual women. However, there was no significant difference with levels of procrastination between homosexual and heterosexual men. To better understand these findings, this study looked at how conscientiousness would mediate this relationship between procrastination and sexual orientation, while depression was predicted to moderate the effect. This was partly supported by the results where this

relationship was mediated by levels of conscientiousness, which was found to be strongly negatively correlated with levels of procrastination. Similar to Steel (2007), we found conscientiousness to be a consistent predictor of procrastination.

However, contrary to the hypothesis, this effect was strongly mediated by conscientiousness, but not by depression, although depression did vary significantly between the groups. Lee; Kelly & Edwards (2006) examined procrastination and neuroticism in the context of conscientiousness and depression and found that depression had no direct link to procrastination but rather it was mediated by conscientiousness. Nevertheless, the relationship between sexuality, procrastination and depression cannot be completely discounted. Indeed, many studies (e.g. Lindsey et al, 1995; Steel, 2007; Uzun et al, 2014) have reported higher levels of depression among non- heterosexual groups and may in part explain the higher level of procrastination reported by lesbian women in this study.

However, contrary to the findings reported by Lippa, (2005), who did not find a significant difference between heterosexual and lesbian women, the current study found conscientiousness scores for non-heterosexual women were comparable to those of men, and distinguishable from those of heterosexual women. Lippa, (2005), had examined lesbian woman only, whereas this study grouped together non-heterosexual and heterosexual groups. Although the average procrastination score of the lesbian group in this study ($M=.49$, $SD=.21$) was nearly identical to the average of the non-heterosexual group ($M=.51$, $SD=.21$), in actuality differences may exist masked by sampling error (Field, 2009). The strong mediation by conscientiousness further

supports the use of this measure as a predictor of procrastination. The marginal p -value for mediation by depression (0.067) suggests that a larger sample, especially for the non-heterosexual group, may be required to more accurately characterise the mediating variables of the relationship between sexual orientation and procrastination in women.

The current study did not actively seek out non-heterosexual participants, and relied on chance exposure to these demographics. On the other hand, the majority of non-heterosexual participants included in Lippa's meta-analysis were scouted in gay and lesbian clubs and pride parade festivals, whereas the heterosexual ones were mainly from colleges (Lippa 2000 & Lippa 2003). The difference in the method of sampling of heterosexual and homosexual participants in Lippa's studies introduced bias that may have impacted the results. Research looking at procrastination and sexuality remains scarce and forming comparisons with non-heterosexual studies has proven challenging. Indeed, how these relationships are mediated by conscientiousness in the context of sexuality requires further examination.

Comparisons between the means of depression scores between subgroups of sexual orientation, as well as results from previous studies (Shearer et al., 2016), indicate a need to differentiate between the subgroups of sexual orientation in the analysis. In addition to a larger sample size, another option is quota sampling participants from each of the subgroups. If quota sampling is used, care should be taken that participant pools do not differ significantly (Field, 2009). Incentives may be offered to reduce the rate of refusal and support the generalizability of findings (Grady, 2005; Wendler, Rackoff, Emanuel, & Grady, 2002).

Further, these findings may not be representative of the general population. To expand, the majority of participants in this study were University students (mean age 26 years). Studies of student samples reveal higher rates of chronic procrastination than in the general population, and it has been estimated that 50% of university students engage in consistent and problematic procrastination (Day, Mensink & O'Sullivan, 2000; Chu & Choi, 2005). The outcomes in this study may mirror those reported by Day *et al.*, (2000), where procrastination mediated by meeting deadlines and examination stress are academic norms irrespective of sexuality. Indeed, this study was conducted during the summer examination period which has been shown to increase students' overall depression and stress-levels (Chernomas & Shapiro C., 2013). This may have resulted in an increased/varied baseline in levels of depression and/or stress among participants thus affecting study outcomes. Certainly, a more diverse sample is needed to improve the generalizability of findings.

Other facets of procrastination including anxiety, impulsivity (Steel, 2010), self-efficacy, perfectionism and coping responses may supplement our understanding of procrastination in the context of sexuality and gender and how 'these relationships' are mediated by conscientiousness and depression. Interestingly, research is now looking at the 'benefits' of procrastination within an academic context and suggest that by accepting procrastination may help modulate stress levels and increase motivational arousal (e.g. Chu, & Choi, 2005; Demeter & Davies, 2013). This research warrants further examination among non-heterosexual student groups in the development of sexuality-based attuned pedagogy.

In conclusion, this study revealed differences in procrastination between the genders and in part non-homosexual groups where it was found that lesbian women procrastinate more on average than heterosexual women. These relationships were mediated by levels of conscientiousness, which was found to be strongly negatively correlated with levels of procrastination. This may put lesbian women at greater vulnerability to the effects of procrastination where consideration of sexual orientation in future studies may serve to better characterize this relationship. For example, looking at the link between personality traits and coping strategies (e.g. daily hassles) may provide a better understanding on how conscientiousness may affect cognitive vigilance and/or avoidance in the context of sexuality. Studies wishing to examine personality differences as a function of sexual orientation should ensure adequate sampling to support generalizability of results while recruiting a sufficiently large sample to differentiate between homosexual and bisexual participants in the analysis. We hope that this study will provide a platform for future research in understanding how multifaceted mediating factors of procrastination may influence non-heterosexual groups coping strategies and in the development of sexuality-based well-being intervention programmes.

* Arbel Vigodny, Samantha Banbury and Joanne Lusher declare no conflict of interest.

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