SOCIAL BEHAVIOR AND PERSONALITY, 2018, *46*(3), 395–408

https://doi.org/10.2224/sbp.6680

PROCRASTINATION AND MULTIDIMENSIONAL PERFECTIONISM: A META-ANALYSIS OF MAIN, MEDIATING, AND MODERATING EFFECTS

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As results of researchers' examination of the relationship between perfectionism and procrastination have often been inconsistent, we conducted a meta-analysis of the relationship between procrastination and multidimensional perfectionism. Results indicated that perfectionistic strivings were negatively linked to procrastination, whereas perfectionistic concerns were positively linked to procrastination. Gender, and the measures of perfectionism and procrastination were found to moderate the relationship between procrastination and multidimensional perfectionism. We found that self-efficacy played a mediating role in the relationship between self-oriented perfectionism and procrastination. Our findings fill a gap in the literature and provide confirmatory evidence that the temporal motivational theory can be applied to gain further understanding of the perfectionism–procrastination relationship.

Keywords: multidimensional perfectionism, procrastination, self-efficacy, temporal motivational theory, meta-analysis.

Procrastination is a prototypical motivational phenomenon, and is defined as a functional delay or tendency to rush (Chu & Choi, 2005; Steel, 2007; Steel & König, 2006). Procrastination has become prevalent throughout the world

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in recent years (Ozer, O'Callaghan, Bokszczanin, Ederer, & Essau, 2014), and is a significant problem in academia, with findings in studies on procrastination showing that between 70% and 95% of students procrastinate (Klassen, Krawchuk, & Rajani, 2008), and 50% of students procrastinate problematically and consistently (Steel, 2007). In addition, procrastination is very prevalent among working adults, with findings showing that approximately 20% of adults procrastinate in their daily lives generally (Hammer & Ferrari, 2002).

Procrastination is harmful to the procrastinator and it occurs in behavioral and emotional dimensions (Fee & Tangney, 2000; Kiamarsi & Abolghasemi, 2014). Previous researchers have examined the correlation between procrastination and individual performance, and found that procrastinators have poorer performance than others (Steel, Brothen, & Wambach, 2001). For example, students who put off a task or assignment tend to obtain a low grade (Kim & Seo, 2015). Procrastination is also common in a variety of other fields such as medicine (e.g., delay in medical treatment) and commerce (e.g., postponement of tax declaration resulting in errors leading to overpayment of taxes; see, e.g., Holland, 2001). Previous researchers have linked procrastination to negative emotions such as depression, anxiety, and frustration (Wolters, 2003). For example, students who procrastinate are more likely than their peers to feel stressed and anxious at the end of a course (Assur, 2003).

Psychology researchers have explored the causes and correlations of procrastination, and have produced models to elucidate the potential influencing factors in procrastination (Dietz, Hofer, & Fries, 2007; Ozer et al., 2014; Seo, 2008). However, the researchers failed to present the full picture of procrastination in these models until Steel and König (2006) used expectancy theory (Vroom, 1964), need theory of motivation (Murray, 1938), cumulative prospect theory (Tversky & Kahneman, 1992), and picoeconomics to propose their *temporal motivational theory* (TMT), which is an integrative motivational model. In regard to TMT, Steel further enhanced understanding of procrastination when he established a nomological web of procrastination. Namely, although the causes of procrastination vary, personality traits play a considerable role in its occurrence, and Steel (2007) suggested in his meta-analysis that conscientiousness is a strong predictor of procrastination.

Perfectionism is broadly defined as a personality trait characterized by individuals having exceedingly high standards for themselves, with accompanying tendencies of extreme self-critical evaluation (Flett & Hewitt, 2002; Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991). Perfectionists have irrational beliefs about the need for them to be perfect, and they rarely feel satisfaction. Previous findings have shown that there is a close correlation between perfectionism and procrastination (e.g., Stöber & Joormann, 2001). However, empirical results have been contradictory in regard to the perfectionism–procrastination relationship.

Some findings show that perfectionism is negatively related to procrastination (Bong, Hwang, Noh, & Kim, 2014; Tian & Deng, 2011), whereas others show there is a positive correlation (Brownlow & Reasinger, 2000; Burns, Dittmann, Nguyen, & Mitchelson, 2000; Flett, Blankstein, Hewitt, & Koledin, 1992).

Meta-analyses could be performed to fill this gap in the literature through aggregation of the resulting values and estimation of the strength of correlations. However, previous meta-analysis results are inconsistent in terms of the correlation between perfectionism and procrastination. Van Eerde (2003) conducted a meta-analysis on procrastination and found that perfectionism was a major cause of procrastination, although the effect size was small. However, Steel's (2007) meta-analysis results indicated that the correlation between perfectionism and procrastination was nonsignificant, leading him to conclude that perfectionism does not contribute to procrastination. There are two possible reasons for the inconsistent results: The first of these is that Van Eerde did not differentiate between multidimensional constructs when he explored the relationship between perfectionism and procrastination; the second possibility is that Steel combined self-perfectionism and other perfectionism dimensions into one variable and combined social perfectionism, self-consciousness, evaluation anxiety, and fear of failure into another variable. Thus, Steel likely distorted the perfectionism–procrastination relationship.

Researchers have tended to subscribe to the belief that perfectionism has multiple dimensions. Since Frost and colleagues (1990) developed the Frost Multidimensional Perfectionism Scale (FMPS), a number of other measures have been proposed to assess multidimensional perfectionism. Stoeber and Otto (2006) classified perfectionism into two dimensions: *perfectionistic strivings*, defined as a form of positive perfectionism that includes high personal performance standards and a self-oriented striving for perfection, and *perfectionistic concerns*, defined as a form of negative perfectionism that includes feelings of discrepancy between expectations and results, doubts about actions, and concern over mistakes and conforming to socially prescribed perfectionism. The approach of differentiating these two dimensions of perfectionism has been supported by factor analysis (Bieling, Israeli, & Antony, 2004), and has been adopted by researchers to examine perfectionism. For example, Hill and Curran (2016) conducted a meta-analysis to explore the relationship between multidimensional perfectionism and burnout by adopting this approach to differentiate types of perfectionism.

Researchers have found that perfectionistic strivings and concerns are useful predictors of some psychological variables (Stoeber, 2011; Stoeber & Otto, 2006). For example, perfectionistic strivings are correlated with positive psychological outcomes, such as achievement motivation and positive affect (Hill, Stoeber, Brown, & Appleton, 2014; Stoeber & Otto, 2006). Perfectionistic

concerns play a significant role as a vulnerability factor for a number of negative psychological outcomes, such as negative affect, depression, and avoidant coping (Dunkley, Sanislow, Grilo, & McGlashan, 2006; Dunkley, Zuroff, & Blankstein, 2003; Stoeber & Childs, 2010). As procrastination is considered a motivational problem, we hypothesized that perfectionistic strivings would be negatively linked to procrastination, and perfectionistic concerns would be positively linked to procrastination. Thus, our first aim in the meta-analysis was to evaluate the strength of the correlation between procrastination and multidimensional perfectionism.

We reasoned that it would also be necessary to explore several potential moderating effects in the correlation between procrastination and multidimensional perfectionism. Therefore, this exploration was our second aim in the meta-analysis. Age might be a possible moderator as researchers have shown that age was negatively related to both perfectionism and procrastination (Landa & Bybee, 2007; Van Eerde, 2003), with younger people being more likely than those in older age groups to be perfectionistic and to procrastinate. Gender might also have an impact on perfectionism and procrastination. Stoeber and Stoeber (2009) found that although men were more often perfectionistic than women in some domains of perfectionism, in perfectionism overall, correlation scores were not significant in the relationship between perfectionism and gender. In addition, although Sepehrian and Lotf (2011) found a significant difference in procrastination according to gender, Steel (2007) reported a weak relationship between gender and procrastination. Van Eerde (2003) found that men were marginally more likely to procrastinate than women.

Our final aim in the meta-analysis was to test the mediating role of self-efficacy in the relationship between procrastination and self-oriented perfectionism. It has been found that self-efficacy has a significant impact on procrastination (Haycock, McCarthy, & Skay, 1998). *Self-efficacy* is individuals' belief that they can accomplish a particular task using their own skills (Bandura, 1997). High self-efficacy individuals tend to use more regulatory strategies than other people and display a greater capacity to persist, whereas low self-efficacy individuals are more likely than high self-efficacy individuals to avoid tasks (Bandura, 1997). Sirois (2004) found that low self-efficacy individuals reported more procrastination behavior than did high self-efficacy individuals. Flett, Hewitt, Blankstein, and Mosher (1995) suggested that perfectionism and procrastination reflected personal efficacy. Seo (2008) proposed a model to test the mediating role of self-efficacy in the correlation between perfectionism and procrastination. The test result indicated that self-efficacy fully mediated the relationship between academic procrastination and self-oriented perfectionism, which is an indicator of perfectionistic strivings.

Method

Literature Search

We conducted a literature search using the databases PsycINFO, PubMed, Academic Search Complete, Web of Science, and ProQuest Dissertations and Theses. We used the search terms "perfection," "perfectionist," "perfectionism," or "perfectionistic," combined with "procrastination," "procrastinate," "postpone," or "delay." We conducted the search on 14 September 2016. The publication years were limited to 1990 to 2016, because the first article in which the concept of multidimensional perfectionism was introduced was published in 1990. We located 126 articles in this search, and added three articles by reviewing the reference lists of these articles and existing meta-analyses. We also contacted the corresponding authors of the articles by email, and requested their unpublished data on the relationship between perfectionism and procrastination. However, after 4 weeks, we had received a response from only one author, who provided one additional data set that had been presented at a conference.

We selected only studies that met the following criteria: The studies must (a) be quantitative, (b) measure perfectionism using a multidimensional perfectionism scale, (c) use a measure of procrastination, (d) use a general or domain-specific self-efficacy scale where relevant, (e) be written in English, and (f) report a correlation coefficient between procrastination and multidimensional perfectionism or provide sufficient statistics to perform conversion into a correlation coefficient. Of the studies that met these criteria, 21 were included in a correlational meta-analysis and two were included in a mediation model in the meta-analysis.

Study Coding

We coded each study as follows: (a) authors and year; (b) number, (c) mean age, and (d) male/female percentage, for participants; (e) measurement of perfectionism, (f) measurement of procrastination, (g) measurement of self-efficacy, for measurements; (h) indicators of perfectionistic strivings, (i) indicators of perfectionistic concerns, for indicators; (j) bivariate correlations between perfectionism and procrastination, and (k) correlation matrices of self-oriented perfectionism, self-efficacy, and procrastination where relevant. Indicators of perfectionistic strivings and perfectionistic concerns were selected based on previous perfectionism studies (Stoeber, 2011; Stoeber & Otto, 2006). Specifically, we included the indicator labeled *personal standards* in the FMPS, *self-oriented perfectionism* from Hewitt and Flett's (1991) Multidimensional Perfectionism Scale (HMPS), and *high standards* from the Almost Perfect Scale-Revised (APS-R; Slaney, Rice, Mobley, Trippi, & Ashby, 2001), as indicators of perfectionistic strivings. We selected *concern over mistakes and doubts about actions* from the FMPS, *socially prescribed perfectionism* from

the HMPS, and *discrepancy* from the APS-R, as indicators of perfectionistic concerns. Two of the authors of this study independently coded the information from the selected studies. Any disagreement was resolved by consensus.

Data Analysis

We conducted meta-analyses using the metafor (Viechtbauer, 2010) and metaSEM (Cheung, 2015) packages with the R statistical computing environment. We used a Hedges/Olkin-type random effects model to compute the mean correlation between procrastination and multidimensional perfectionism (Hedges & Olkin, 1985; Lipsey & Wilson, 2001). In terms of heterogeneity, subgrouping and metaregression were conducted to explore moderators. We used a two-stage structural equation modeling (TSSEM) method to assess the mediation model (Cheung & Chan, 2005, 2009). The pooled correlation matrix and its asymptotic covariance matrix were estimated in Stage 1, and then the proposed model was fitted in Stage 2. To test the homogeneity of the correlation matrices, we calculated model fit statistics including chi square (χ^2), degrees of freedom (*df*), comparative fit index (CFI), and root mean square error of approximation (RMSEA). In regard to the mediation model, statistics concerning both the direct and indirect paths, as well as the Sobel, Aroian, and Goodman tests, were computed.

Results

Relationship Between Procrastination and Multidimensional Perfectionism

In the 21 studies included in the meta-analysis, there were 14,604 participants from 56 samples (sample size range = 77 to 524 participants, mean age range = 13.00 to 30.28 years, female percentage range = 47.90% to 78.41%). We calculated sample sizes (*k*), number of participants (*N*), mean weighted effect sizes (*r*), 95% confidence intervals (CI), heterogeneity statistics (*Q*), and Rosenthal's fail-safe *N*, using a random-effects model. A negatively significant mean-weighted correlation of $r = -.136$ ($z = -4.785$, $p < .001$, 95% CI [-0.192, -0.081], $Q = 92.329$; $p < .001$, fail-safe $N = 893$) was found for the correlation between procrastination and perfectionistic strivings, and a positively significant mean-weighted correlation of $r = .200$ ($z = 7.986$, $p < .001$, 95% CI [0.151, 0.249], $Q = 269.471$; $p < .001$, fail-safe $N = 5{,}016$) was found for the correlation between procrastination and perfectionistic concerns.

Moderation Analysis

Age. To examine age as a potential moderator, we performed metaregression. The results ($Q_{\text{Model}} = 3.651$, $p > .05$; $Q_{\text{Model}} = 2.467$, $p > .05$) suggested that the age of participants did not significantly affect the correlation between procrastination and multidimensional perfectionism.

Table 1. *The Effects of Moderators on the Relationship Between Perfectionism and Procrastination*

	Q_b	k	Mean r	95% confidence interval		Q_b	k	Mean r	95% confidence interval	
				Lower limit	Upper limit				Lower limit	Upper limit
Perfectionistic strivings	Perfectionistic concerns									
Perfectionism measures	23.966***					83.282***				
HMPS		12	-.232	-0.383	-0.080		3	0.199	0.128	0.270
FMPS		7	-.133	-0.229	-0.037		16	0.164	0.100	0.228
APS-R		3	-.112	-0.192	-0.033		15	0.387	0.243	0.530
Procrastination measures	23.074**					81.051***				
TPS		5	-.092	-0.210	0.025		12	0.278	0.203	0.353
PASS		10	-.174	-0.259	-0.089		14	0.135	0.065	0.206
GPS		4	-.122	-0.264	0.019		5	0.179	0.054	0.304
AIP		1	.010	-0.309	0.329		1	0.239	0.036	0.443
API		2	-.136	-0.340	0.069		2	0.140	-0.174	0.454

Note. HMPS = Multidimensional Perfectionism Scale, FMPS = Frost Multidimensional Perfectionism Scale, APS-R = Almost Perfect Scale-Revised, TPS = Tuckman Procrastination Scale, PASS = Procrastination Assessment Scale-Student, GPS = General Procrastination Scale, AIP = Adult Inventory of Procrastination, API = Aitken Procrastination Inventory. * $p < .05$, ** $p < .01$, *** $p < .001$.

Gender. We performed metaregression to evaluate gender as a moderator. The result ($Q_{\text{Model}} = 2.289$, $p > .05$) indicated that gender was not a significant moderator in the correlation between procrastination and perfectionistic strivings, but the result ($Q_{\text{Model}} = 4.964$, $p < .05$) indicated that gender was a significant moderator in the correlation between procrastination and perfectionistic concerns.

Perfectionism measures. We included the FMPS, HMPS, and APS-R scores in the meta-analysis. As shown in Table 1, subgrouping results ($Q_b = 23.966$, $df = 2$, $p < .001$; $Q_b = 83.282$, $df = 2$, $p < .001$) suggested that the three perfectionism measures yielded results showing a significant effect of the measure in the relationship between procrastination and multidimensional perfectionism. The correlation between procrastination and perfectionistic strivings as measured by the HMPS was significantly higher than when either of the other two measures was used, whereas the correlation between procrastination and perfectionistic concerns as measured by the APS-R was significantly higher than when either of the two other measures was used.

Procrastination measures. We included five procrastination measures in the meta-analysis: Adult Inventory of Procrastination (McCown & Johnson, 1989), Aitken Procrastination Inventory (API; Aitken, 1982), General Procrastination Scale (Lay, 1986), Procrastination Assessment Scale-Student (PASS; Solomon & Rothblum, 1984), and Tuckman Procrastination Scale (TPS; Tuckman, 1991). As shown in Table 1, subgrouping results ($Q_b = 23.966$, $df = 2$, $p < .001$; $Q_b = 83.282$, $df = 2$, $p < .001$) suggested that the actual procrastination measure used significantly affected the correlation between procrastination and multidimensional perfectionism. According to the 95% CI results, only one correlation with the PASS was significant in the group of indicators of perfectionistic strivings, whereas four measures resulted in significant correlations in the group of indicators of perfectionistic concerns, with only the correlation with the API being nonsignificant. In particular, when the TPS was used, the correlation between procrastination and perfectionistic concerns was significantly higher than when any of the other measures were used.

Mediation Analysis

A mediation model was proposed to examine self-efficacy as a mediator, using the pooled correlation matrices from every relevant study (see Figure 1). In Stage 1, we calculated model fit statistics to test the homogeneity of the correlation matrices. As the value of fit indices ($\chi^2 = 7.158$, $df = 3$, CFI = .984, RMSEA = .076) suggested a rejection of the heterogeneity hypothesis, we conducted the analysis with a fixed-effects TSSEM. In Stage 2, we compared a set of alternative models. The results indicated that the mediation model demonstrated the best fit ($\chi^2 = 0.00$, $df = 0$, CFI = 1.00, RMSEA = .00). Sobel, Aroian, and Goodman tests were conducted to test the significance of the indirect effect from self-oriented

perfectionism to procrastination through self-efficacy, and the results were statistically significant (Sobel test = -7.694, $p < .01$; Aroian test = -7.681, $p < .01$; Goodman test = -7.707, $p < .01$).

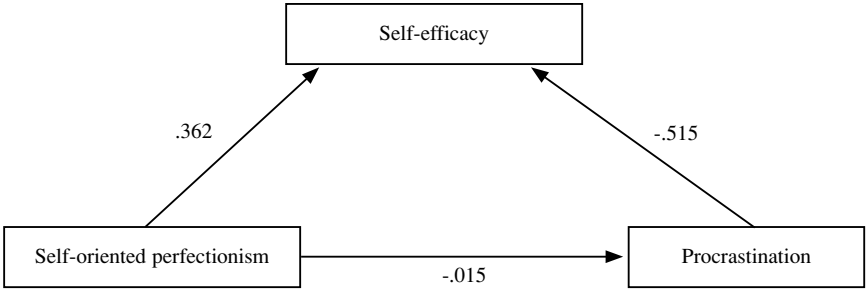

Figure 1. *Path model of the mediating role of self-efficacy in the relationship between procrastination and self-oriented perfectionism. N = 483.*

Discussion

Our findings about the relationship between procrastination and multidimensional perfectionism are not consistent with two previous meta-analyses (i.e., Steel, 2007; Van Eerde, 2003). The main reason for this is the application of the methodology. Namely, we assessed the strength of the correlation between perfectionism and procrastination from a multidimensional perspective. In contrast, Van Eerde (2003) regarded perfectionism as a unidimensional construct, and Steel (2007), by combining self-consciousness, evaluation anxiety, social perfectionism, and fear of failure into one variable, may have distorted the perfectionism–procrastination relationship. However, Ozer et al.'s (2014) findings that personal standards of perfectionism were negatively correlated with procrastination, whereas the perfectionistic concerns indicator of doubts about actions was positively correlated with procrastination, are consistent with our findings in the meta-analysis.

Despite the nonsignificant correlation that Steel (2007) reported between perfectionism and procrastination, the TMT (Steel & König, 2006) can provide an explanation for our findings. As individuals with high perfectionistic strivings set themselves high standards, put a high value on their tasks, and have expectations of great results, they tend to finish tasks on time (Bong et al., 2014). In contrast, individuals with high perfectionistic concerns worry about their mistakes, have doubts regarding their actions, have feelings of discrepancy between expectations and results, avoid disapproval by others, and excessively fear failure, may be more prone to delaying tasks. Our results provide

evidence that the TMT can account for the link between perfectionism and procrastination.

We found that gender was a significant moderator in the relationship between procrastination and perfectionistic concerns. Male participants with high perfectionistic concerns were more likely than women to procrastinate, although the influence of gender was very weak. Each measure of perfection and procrastination moderated the correlation between perfectionism and procrastination. Although the different measures were designed to evaluate the same variable, the conceptualizations were not same. For example, the APS-R does not conceptually map on to the HMPS or the FMPS. Therefore, each measure moderated the correlation between perfectionism and procrastination to a different degree.

Our results indicated that self-efficacy plays a mediating role in the relationship between procrastination and self-oriented perfectionism. Expectancy theory, which is a fundamental theory in TMT, is very similar to self-efficacy theory (Bandura & Locke, 2003; Steel & König, 2006; Vancouver, Thompson, & Williams, 2001). High self-oriented perfectionism individuals tend to set themselves high standards and expect a lot from themselves, which may result in them having the self-confidence to complete tasks on time (Seo, 2008). In other words, they have high self-efficacy, which is less likely to be found in procrastinators. Our findings augment the evidence supporting the theoretical framework for TMT.

Our results support the mediation model proposed by Seo (2008), who explored self-efficacy as a mediator in the relationship between academic procrastination and self-oriented perfectionism. In the mediation model in our meta-analysis, not only was self-oriented perfectionism an indicator of perfectionistic strivings, but also of other indicators such as high standards. We excluded Seo's study from our meta-analysis because there were insufficient data to calculate the correlation coefficient. As Seo separated self-oriented perfectionism into two parcels, academic procrastination into two areas, and self-efficacy into three dimensions, this would have led to a very large inflation of effect sizes. Specifically, Seo reported four correlations between self-oriented perfectionism and academic procrastination and 12 correlation matrices of perfectionism, procrastination, and self-efficacy. As we tested only two correlation matrices for mediation in our meta-analysis, such a large inflation could not have been accepted. We were unable to test indicators of perfectionistic strivings other than self-oriented perfectionism in the mediation model, because there were insufficient data according to the criteria for inclusion in our meta-analysis.

Previous researchers have identified explanatory factors other than the mediating role of self-efficacy. For example, in the education domain, several potential mediators of perfectionism and academic procrastination, such as psychological capital, test anxiety, and achievement motivation, have been

identified (Hashemi & Latifian, 2014; Hicks & Yao, 2015; Tian & Deng, 2011). Chen (2014) also found that coping has a significant mediating role in the perfectionism–procrastination relationship.

As, to our knowledge, ours was the first review of the relationship between procrastination and multidimensional perfectionism, our meta-analysis has played an important role in filling a gap in the literature. However, despite the mediators that we identified in our meta-analysis, we believe that there are still many factors that have not been identified. Therefore, more studies are needed in which researchers shed light on the mechanisms underlying the relationship between perfectionism and procrastination by identifying additional factors in this relationship.

There are two limitations in this study. First, we examined multidimensional perfectionism, in which perfectionistic strivings and perfectionistic concerns were higher-order dimensions. As we selected the indicators of these two dimensions, some other indicators of perfectionism were lost. We acknowledge that different measurements have been adopted in other studies. Second, only a relatively small number of studies have been conducted in which the mediation model has been tested. Specifically, correlations were reported among self-oriented perfectionism, procrastination, and self-efficacy in only two studies. Therefore, the results of our mediation model may be reversed in future findings.

In conclusion, we provided evidence in our meta-analysis to suggest that perfectionistic strivings are negatively linked to procrastination, and, in contrast, the link between perfectionistic concerns and procrastination is positive. In addition, gender, perfectionism measures, and procrastination measures are moderators in the relationship between perfectionism and procrastination. The results of our mediation model are consistent with previous ones, indicating that self-efficacy plays a mediating role in the relationship between procrastination and self-oriented perfectionism.

References

Aitken, M. E. (1982). *A personality profile of the college student procrastinator* (Unpublished doctoral dissertation). University of Pittsburgh, Pittsburgh, PA.

Assur, A. M. (2003). *The relationship of academic procrastination to affective and cognitive components of subjective well-being* (Unpublished doctoral dissertation). New School for Social Research, New York, NY.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bandura, A., & Locke, E. A. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, *88*, 87–99. **https://doi.org/fg8wgx**

Bieling, P. J., Israeli, A. L., & Antony, M. M. (2004). Is perfectionism good, bad, or both? Examining models of the perfectionism construct. *Personality and Individual Differences*, *36*, 1373–1385. **https://doi.org/cwz**

Bong, M., Hwang, A., Noh, A., & Kim, S. I. (2014). Perfectionism and motivation of adolescents in academic contexts. *Journal of Educational Psychology*, *106*, 711–729. **https://doi.org/b5rj**

Brownlow, S., & Reasinger, R. D. (2000). Putting off until tomorrow what is better done today: Academic procrastination as a function of motivation toward college work. *Journal of Social Behavior and Personality*, *15*, 15–34.

Burns, L. R., Dittmann, K., Nguyen, N.-L., & Mitchelson, J. K. (2000). Academic procrastination, perfectionism, and control: Associations with vigilant and avoidant coping. *Journal of Social Behavior and Personality*, *15*, 35–46.

Chen, S. (2014). *Procrastination and perfectionism: The mediating role of active coping* (Unpublished thesis). Bond University, Queensland, Australia.

Cheung, M. W.-L. (2015). MetaSEM: An R package for meta-analysis using structural equation modeling. *Frontiers in Psychology*, *5*, 1521. **https://doi.org/f6xb76**

Cheung, M. W.-L., & Chan, W. (2005). Meta-analytic structural equation modeling: A two-stage approach. *Psychological Methods*, *10*, 40–64. **https://doi.org/b38vh4**

Cheung, M. W.-L., & Chan, W. (2009). A two-stage approach to synthesizing covariance matrices in meta-analytic structural equation modeling. *Structural Equation Modeling*, *16*, 28–53. **https://doi.org/cq5hqn**

Chu, A. H. C., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination behavior on attitudes and performance. *The Journal of Social Psychology*, *145*, 245–264. **https://doi.org/dxcw6t**

Dietz, F., Hofer, M., & Fries, S. (2007). Individual values, learning routines and academic procrastination. *British Journal of Educational Psychology*, *77*, 893–906. **https://doi.org/dz5ftk**

Dunkley, D. M., Sanislow, C. A., Grilo, C. M., & McGlashan, T. H. (2006). Perfectionism and depressive symptoms 3 years later: Negative social interactions, avoidant coping, and perceived social support as mediators. *Comprehensive Psychiatry*, *47*, 106–115. **https://doi.org/fvp4p5**

Dunkley, D. M., Zuroff, D. C., & Blankstein, K. R. (2003). Self-critical perfectionism and daily affect: Dispositional and situational influences on stress and coping. *Journal of Personality and Social Psychology*, *84*, 234–252. **https://doi.org/fscr6w**

Fee, R. L., & Tangney, J. P. (2000). Procrastination: A means of avoiding shame or guilt? *Journal of Social Behavior and Personality*, *15*, 167–184.

Flett, G. L., Blankstein, K. R., Hewitt, P. L., & Koledin, S. (1992). Components of perfectionism and procrastination in college students. *Social Behavior and Personality: An international journal*, *20*, 85–94. **https://doi.org/d7q7pk**

Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment: An overview of theoretical, definitional, and treatment issues. In P. L. Hewitt & G. L. Flett (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 5–31). Washington, DC: American Psychological Association.

Flett, G. L., Hewitt, P. L., Blankstein, K. R., & Mosher, S. W. (1995). Perfectionism, life events, and depressive symptoms: A test of a diathesis-stress model. *Current Psychology*, *14*, 112–137. **https://doi.org/fs5nj9**

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, *14*, 449–468. **https://doi.org/cw8**

Hammer, C. A., & Ferrari, J. R. (2002). Differential incidence of procrastination between blue and white-collar workers. *Current Psychology*, *21*, 333–338. **https://doi.org/b6x2hn**

Hashemi, L., & Latifian, M. (2014). Test anxiety as a mediator between perfectionism and academic procrastination. *Journal of Teaching and Education*, *3*, 509–520.

Haycock, L. A., McCarthy, P., & Skay, C. L. (1998). Procrastination in college students: The role of self-efficacy and anxiety. *Journal of Counseling & Development*, *76*, 317–324. **https://doi.org/fxq9jn**

Hedges, L., & Olkin, I. (1985). *Statistical models for meta-analysis*. New York, NY: Academic Press.

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, *60*, 456–470. **https://doi.org/cw9**

Hicks, R. E., & Yao, F. M. (2015). Psychological capital as mediator between adaptive perfectionism and academic procrastination. *GSTF Journal of Psychology (JPsych)*, *2*, 34–40.

Hill, A. P., & Curran, T. (2016). Multidimensional perfectionism and burnout: A meta-analysis. *Personality and Social Psychology Review*, *20*, 269–288. **https://doi.org/f8xcvz**

Hill, A. P., Stoeber, J., Brown, A., & Appleton, P. R. (2014). Team perfectionism and team performance: A prospective study. *Journal of Sport and Exercise Psychology*, *36*, 303–315. **https://doi.org/f562rn**

Holland, T. (2001). The perils of procrastination. *Far Eastern Economic Review*, *164*, 66–72.

Kiamarsi, A., & Abolghasemi, A. (2014). The relationship of procrastination and self-efficacy with psychological vulnerability in students. *Procedia - Social and Behavioral Sciences*, *114*, 858–862. **https://doi.org/b5rk**

Kim, K. R., & Seo, E. H. (2015). The relationship between procrastination and academic performance: A meta-analysis. *Personality and Individual Differences*, *82*, 26–33. **https://doi.org/bjp9**

Klassen, R. M., Krawchuk, L. L., & Rajani, S. (2008). Academic procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology*, *33*, 915–931. **https://doi.org/dq2fmv**

Landa, C. E., & Bybee, J. A. (2007). Adaptive elements of aging: Self-image discrepancy, perfectionism, and eating problems. *Developmental Psychology*, *43*, 83–93. **https://doi.org/fkz7ct**

Lay, C. H. (1986). At last, my research article on procrastination. *Journal of Research in Personality*, *20*, 474–495. **https://doi.org/bpbd9b**

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.

McCown, W., & Johnson, J. (1989, August). *Validation of the Adult Inventory of Procrastination*. Paper presented at the 97th Annual Convention of the American Psychological Association, New Orleans, LA.

Murray, H. A., & Harvard University. (1938). *Explorations in personality: A clinical and experimental study of fifty men of college age*. New York, NY: Oxford University Press.

Ozer, B. U., O'Callaghan, J., Bokszczanin, A., Ederer, E., & Essau, C. (2014). Dynamic interplay of depression, perfectionism and self-regulation on procrastination. *British Journal of Guidance & Counselling*, *42*, 309–319. **https://doi.org/b5rm**

Seo, E. H. (2008). Self-efficacy as a mediator in the relationship between self-oriented perfectionism and academic procrastination. *Social Behavior and Personality: An international journal*, *36*, 753–764. **https://doi.org/bp6hwb**

Sepehrian, F., & Lotf, J. J. (2011). The effects of coping styles and gender on academic procrastination among university students. *Journal of Basic and Applied Scientific Research*, *1*, 2987–2993.

Sirois, F. M. (2004). Procrastination and intentions to perform health behaviors: The role of self-efficacy and the consideration of future consequences. *Personality and Individual Differences*, *37*, 115–128. **https://doi.org/dnrq37**

Slaney, R. B., Rice, K. G., Mobley, M., Trippi, J., & Ashby, J. S. (2001). The Revised Almost Perfect Scale. *Measurement and Evaluation in Counseling and Development*, *34*, 130–145.

Solomon, L. J., & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive–behavioral correlates. *Journal of Counseling Psychology*, *31*, 503–509. **https://doi.org/fhb69d**

Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, *133*, 65–94. **https://doi.org/dzkjn2**

Steel, P., Brothen, T., & Wambach, C. (2001). Procrastination and personality, performance, and mood. *Personality and Individual Differences*, *30*, 95–106. **https://doi.org/fpv7nk**

Steel, P., & König, C. J. (2006). Integrating theories of motivation. *Academy of Management Review*, *3*, 889–913. **https://doi.org/bsn6kw**

Stöber, J., & Joormann, J. (2001). Worry, procrastination, and perfectionism: Differentiating amount of worry, pathological worry, anxiety, and depression. *Cognitive Therapy and Research*, *25*, 49–60. **https://doi.org/b7d4w8**

Stoeber, J. (2011). The dual nature of perfectionism in sports: Relationships with emotion, motivation, and performance. *International Review of Sport and Exercise Psychology*, *4*, 128–145. **https://doi.org/cwfb7j**

Stoeber, J., & Childs, J. H. (2010). The assessment of self-oriented and socially prescribed perfectionism: Subscales make a difference. *Journal of Personality Assessment*, *92*, 577–585. **https://doi.org/bn6kmg**

Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review*, *10*, 295–319. **https://doi.org/bdkhzj**

Stoeber, J., & Stoeber, F. S. (2009). Domains of perfectionism: Prevalence and relationships with perfectionism, gender, age, and satisfaction with life. *Personality and Individual Differences*, *46*, 530–535. **https://doi.org/c2f5nv**

Tian, Q., & Deng, S. (2011). Mediating role of self-efficacy between positive perfectionism and procrastination [In Chinese]. *Chinese Journal of Clinical Psychology, 19*, 221–224.

Tuckman, B. W. (1991). The development and concurrent validity of the Procrastination Scale. *Educational and Psychological Measurement*, *51*, 473–480. **https://doi.org/frdtnr**

Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, *5*, 297–323. **https://doi.org.cb57hk**

Van Eerde, W. (2003). A meta-analytically derived nomological network of procrastination. *Personality and Individual Differences*, *35*, 1401–1418. **https://doi.org/fdkhhp**

Vancouver, J. B., Thompson, C. M., & Williams, A. A. (2001). The changing signs in the relationships among self-efficacy, personal goals, and performance. *Journal of Applied Psychology*, *86*, 605–620. **https://doi.org/cg8q9k**

Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software*, *36*, 1–48. Retrieved from **https://bit.ly/2E1tRFm**

Vroom, V. H. (1964). *Work and motivation*. New York, NY: Wiley.

Wolters, C. A. (2003). Understanding procrastination from a self-regulated learning perspective. *Journal of Educational Psychology*, *95*, 179–187. **https://doi.org/bzctm7**