Is perfectionism associated with academic burnout through repetitive negative thinking?

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Academic burnout is prevalent among university students, although understanding of what predicts burnout is limited. This study aimed to test the direct and indirect relationship between two dimensions of perfectionism (Perfectionistic Concerns and Perfectionistic Strivings) and the three elements of Academic Burnout (Exhaustion, Inadequacy, and Cynicism) through Repetitive Negative Thinking. In a cross-sectional survey, undergraduate students (n = 126, M_{age} = 23.64, 79% Female) completed well-validated measures of Perfectionism, Repetitive Negative Thinking, and Academic Burnout. Perfectionistic Concerns was directly associated with all elements of burnout, as well as indirectly associated with Exhaustion and Cynicism via Repetitive Negative Thinking. Perfectionistic Strivings was directly associated with less Inadequacy and Cynicism; however, there were no indirect associations between Perfectionistic Strivings and Academic Burnout operating through Repetitive Negative Thinking. Repetitive Negative Thinking was also directly related to more burnout Exhaustion and Inadequacy, but not Cynicism. It is concluded that future research should investigate whether interventions targeting Perfectionistic Concerns and Repetitive Negative Thinking can reduce Academic Burnout in university students.

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15   **Abstract**

17   Academic burnout is prevalent among university students, although understanding of what

18   predicts burnout is limited. This study aimed to test the direct and indirect relationship between

19   two dimensions of perfectionism (Perfectionistic Concerns and Perfectionistic Strivings) and the

20   three elements of Academic Burnout (Exhaustion, Inadequacy, and Cynicism) through Repetitive

21   Negative Thinking. In a cross-sectional survey, undergraduate students ($n = 126$, $M_{age} = 23.64$,

22   79% Female) completed well-validated measures of Perfectionism, Repetitive Negative

23   Thinking, and Academic Burnout. Perfectionistic Concerns was directly associated with all

24   elements of burnout, as well as indirectly associated with Exhaustion and Cynicism via

25   Repetitive Negative Thinking. Perfectionistic Strivings was directly associated with less

26   Inadequacy and Cynicism; however, there were no indirect associations between Perfectionistic

27   Strivings and Academic Burnout operating through Repetitive Negative Thinking. Repetitive

28   Negative Thinking was also directly related to more burnout Exhaustion and Inadequacy, but not

29   Cynicism. It is concluded that future research should investigate whether interventions targeting

30   Perfectionistic Concerns and Repetitive Negative Thinking can reduce Academic Burnout in

31   university students.

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34   Individuals experiencing burnout have difficulty committing to the task at hand, feel

35   detached and dissatisfied with their work, and are less productive (Leiter & Maslach, 2003).

36   Research has identified three main dimensions of burnout: Exhaustion; Cynicism; and

37   Inadequacy. Exhaustion refers to the stress that leaves an individual feeling unable to commit to

38   the task at hand (Maslach & Jackson, 1981). Cynicism refers to an individual's cynical attitude

39   toward work, which leads to negative, detached feelings towards their work (Leiter & Maslach,

40   2003). Inadequacy refers to the individual feeling incompetent at work, which is often

41   accompanied by reduced productivity and dissatisfaction with their work achievements (Leiter &

42   Maslach, 2003). Whilst much research has studied burnout in the workplace, recent research is

43   exploring how these aspects of burnout present in university students, which is important given

44   evidence that Academic Burnout is associated with poor educational outcomes (Mazurklewicz,

45   Korenstein, Fallar, & Ripp, 2011; Zhang, Gan, & Cham, 2007).

46   Similar to burnout in other contexts, Academic Burnout involves three elements:

47   *Exhaustion* due to study demands; feelings of *Inadequacy* as a student due to the long-term stress

48   of striving for academic achievement; and a *Cynical Attitude* toward study (Merino-Tejedor,

49   Sánchez-García, Prizmic-Kuzmica, & Vigil-Colet, 2014; Salmela-Aro, Kiuru, Leskinen, &

50   Nurmi, 2009). Academic burnout is associated with various negative consequences, including

51   poor academic outcomes, increased psychological distress, reduced life satisfaction, and sleep

52   deprivation (e.g., May, Bauer, & Fincham, 2015; Mazurklewicz et al., 2011; Salmela-Aro &

53   Upadyaya, 2014). Given that Academic Burnout is highly prevalent among university students

54   (e.g., Kristanto, Chen, & Thoo, 2016; Mazurklewicz et al., 2011), it is important to develop

55   methods of reducing Academic Burnout. A vital step towards this is to identify factors associated

56   with burnout. Perfectionism has been linked to numerous psychological symptoms (e.g.,

57   Limburg, Watson, Hagger, & Egan, 2017) and preliminary evidence also indicates that it predicts

58   Academic Burnout (Kljajic, Gaudreau, & Franche, 2017). Additionally, there is emerging

59   evidence that the relationship between perfectionism and various psychological symptoms is

60   mediated by Repetitive Negative Thinking (Egan, Hattaway, & Kane, 2014). Consequently, the

61   current study will investigate whether two forms of perfectionism (Perfectionistic Concerns and

62   Perfectionistic Strivings) predict the elements of Academic Burnout, and whether these

63   relationships are mediated by Repetitive Negative Thinking.

64   Perfectionism has been implicated in the development and maintenance of a variety of

65   psychopathologies (e.g., Limburg et al., 2017) and is also associated with Academic Burnout

66   (Kljajic et al., 2017). Across multiple perfectionism scales, there consists of two higher order

67   dimensions: Perfectionistic Concerns and Perfectionistic Strivings (Burgess, Frost, & DiBartolo,

68   2016; Limburg et al., 2017; Stoeber & Otto, 2006). Perfectionistic Concerns involves being

69   overly concerned about mistakes in performance as well as doubting one's actions, and is

70   consistently related to negative psychological outcomes (Bieling, Israeli, & Antony, 2004;

71   Limburg et al., 2017). Across two of the most popular perfectionism scales the Concern over

72   Mistakes, Doubts about Actions, Parental Expectations, and Parental Criticism Subscales from

73   the Frost Multidimensional Perfectionism Scale (FMPS; Frost, Marten, Lahart, & Rosenblate,

74   1990), and Socially Prescribed Perfectionism from the Hewitt and Flett Multidimensional

75   Perfectionism Scale (HMPS; Hewitt & Flett, 1991) consistently load onto Perfectionistic

76   Concerns factor (Bieling et al., 2004; Limburg et al., 2017). Perfectionistic Strivings involves the

77   setting of high personal standards, which has been associated with both positive and negative

78   psychological outcomes (Limburg et al., 2017; Smith, et al., 2016; Stoeber & Childs, 2010). The

79   Personal Standards and Organisation subscales of the FMPS, and the Self-Oriented

80   Perfectionism and Other-Oriented Perfectionism subscales of the HMPS consistently load onto

81   the Perfectionistic Strivings factor (Bieling et al., 2004; Limburg et al., 2017).

82   The relationship between perfectionism and burnout has been examined in various non-

83   academic contexts, with Perfectionistic Concerns reliably associated with higher burnout, and

84   aspects of burnout (Exhaustion, Inadequacy, and Cynicism), in many samples, including teachers

85   and junior athletes (e.g., Hill, 2013, Stoeber & Rennert, 2008). In contrast, Perfectionistic

86   Strivings has been associated with lower levels of burnout, although the relationship is somewhat

87   inconsistent across the various aspects of burnout (Hill, 2013; Stoeber & Rennert, 2008).

88   The few studies that have directly examined the relationship between perfectionism and

89   Academic Burnout have reported broadly consistent findings. Using the Chinese translation of

90   the Frost Multidimensional Perfectionism Scale, Zhang and colleagues (2007) demonstrated that

91   Perfectionistic Concerns (measured by Concern over Mistakes, Doubts about Actions, and

92   Parental Expectations subscales) and Perfectionistic Strivings (measured by Personal Standards

93   and Organisation subscales) predicted aspects of Academic Burnout in a sample of 482 Chinese

94   university students. Specifically higher levels of Perfectionistic Concerns predicted more

95   Exhaustion and Cynicism, and less engagement with university. Higher levels of Perfectionistic

96   Strivings predicted lower levels of Exhaustion and Cynicism, and more engagement. These

97   results suggest that individuals with higher levels of Perfectionistic Concerns are more likely to

98   experience higher levels of Academic Burnout, whilst individuals with higher levels of

99   Perfectionistic Strivings are likely to experience lower Academic Burnout and higher study

100 efficacy.

101   Kljajic and colleagues (2017) categorised students as either pure socially prescribed

102 perfectionists, pure self-oriented perfectionists, mixed perfectionists (involving high levels of

103 socially prescribed and self-oriented perfectionism), or non-perfectionistic. Socially prescribed

104 perfectionists (related to Perfectionistic Concerns) were more likely to experience Academic

105 Burnout, as measured separately by Exhaustion, Cynicism, and study efficacy, than non-

106 perfectionists or mixed perfectionists. Moreover, self-oriented perfectionists (related to

107 Perfectionistic Strivings) were less likely to experience Academic Burnout than non-

108   perfectionists and mixed perfectionists. Perfectionism also predicts Academic Burnout among

109   high school students (Shih, 2012). Despite the emerging evidence, few studies have considered

110   the possible role of variables that may mediate the association between perfectionism and

111   Academic Burnout. Repetitive Negative Thinking is one potential candidate that warrants

112   investigation.

113   Repetitive Negative Thinking is an unhelpful continual thought process about past and/or

114   future negative situations, leading to negative emotional states (McLaughlin & Nolen-Hoeksema,

115   2011). It appears to be a risk factor for the development of numerous types of psychopathology

116   (e.g., McEvoy, Watson, Watkins, & Nathan, 2013). Interestingly, Repetitive Negative Thinking

117   mediates the relationship between perfectionism and various psychological difficulties, including

118   depression (Flett, Coulter, Hewitt, & Nepon, 2011), post-traumatic stress disorder (Egan et al.,

119   2014), and psychological distress (Macedo et al., 2015; O'Connor, O'Connor, & Marshall,

120   2007). Macedo and colleagues (2015) found that Repetitive Negative Thinking partially

121   mediated the positive relationship between Perfectionistic Concerns and aspects of psychological

122   distress (anxiety, depression, anger-hostility, fatigue, and vigor). Interestingly, Repetitive

123   Negative Thinking fully mediated the relationship between Perfectionistic Strivings and

124   depression and fatigue, meaning that Perfectionistic Strivings only predicted higher distress

125   through its relationship with Repetitive Negative Thinking. However, it should be noted that

126   Perfectionistic Strivings did not predict the other aspects of distress in this study. Given the

127   associations between Repetitive Negative Thinking and both perfectionism and other

128   psychological outcomes, it is plausible that Repetitive Negative Thinking may mediate

129   associations between perfectionism and Academic Burnout.

130   The current study aimed to 1) replicate associations between perfectionism

131   (Perfectionistic Concerns and Perfectionistic Strivings) and Academic Burnout (Exhaustion,

132   Inadequacy, and Cynicism) and 2) investigate whether Repetitive Negative Thinking mediates

133   the relationships between perfectionism and the elements of Academic Burnout. The

134   hypothesised model is summarised in Figure 1. The model tested the direct pathways between

135   perfectionism and burnout, as well as the indirect relationships operating via Repetitive Negative

136   Thinking.

137   [Insert Figure 1 about here]

138   **Method**

Participants

The sample initially consisted of 215 Australian university students aged 18 and over. However, 89 individuals simply opened and closed the survey without indicating consent or responding to any items, leaving a final sample of 126. The final sample (100 females, 25 males, 1 transgender) ranged in age from 18-69 (M = 23.64, SD = 7.86), years at university from 1-8 years (M = 3.07, SD = 1.56), and studying predominantly full-time (104 full time, 22 part time). Of the 126 participants, 57 were recruited from a research participation pool from the School of Psychology at Curtin University and received course credit for participation, while 69 were recruited from other courses via social media, though specific courses were not recorded. There were no significant differences between the mean scores of these two sample groups on any measure used in the study.

Measures

Demographics. Demographic questions measured age, gender, study mode (i.e. full-time or part-time), and number of years completed at university.

Frost Multidimensional Perfectionism Scale - Brief (FMPS-Brief; Burgess et al., 2016). The FMPS-Brief (Burgess et al., 2016) is an 8-item scale measuring two aspects of perfectionism: Perfectionistic Concerns (four items, e.g., *If I fail at university, I am a failure as a person*) and Perfectionistic Strivings (four items, e.g., *I have extremely high goals*). Items are rated on a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). Scores are summed (ranging between 4 and 20), with higher scores indicative of higher levels of Perfectionistic Concerns or Strivings. The Perfectionistic Concerns subscale is strongly, positively correlated with measures of depression, anxiety, hoarding, and worry, indicating good convergent validity (Burgess et al., 2016; Limburg et al., 2017). The Perfectionistic Concerns and Strivings subscales have demonstrated good internal consistency in community samples previously (α = .83 and α = .81, respectively Burgess et al., 2016), as well as in the present study (α = .78 and α = .88, respectively).

Repetitive Negative Thinking - 10 (RNT-10; McEvoy, Mahoney, & Moulds, 2010). The RNT-10 was adapted from the Repetitive Negative Thinking Scale (McEvoy et al., 2010). It contains 10 items assessing engagement with Repetitive Negative Thinking (e.g., *Once you start thinking about the situation, you can't stop*). Items are rated on a 5-point Likert scale ranging from *not true at all* (1) to *very true* (5). Responses from all 10 items are summed (ranging

170   between 10 and 50), with higher scores indicate higher levels of engagement with Repetitive

171   Negative Thinking. The RNT-10 is positively correlated with measures of neuroticism,

172   depression, social anxiety, and worry, indicating convergent validity (Mahoney, McEvoy, &

173   Moulds, 2012). The RNT-10 demonstrated scale reliability in initial development (α = .89,

174   average inter-item correlation = .44; McEvoy et al., 2010) and subsequent research (α = .91,

175   average inter-item correlation = .49; Mahoney et al., 2012). In the present study the internal

176   consistency of the RNT-10 was high (α = .94).

177   *School Burnout Inventory (SBI; Salmela-Aro & Näätänen, 2005).* The SBI (Salmela-Aro

178   & Näätänen, 2005) is a 9-item questionnaire with 3 subscales: Exhaustion at School (four items,

179   e.g., *I feel overwhelmed by my university work*), Cynicism Toward Meaning of School (three

180   items, e.g., *I feel that I am losing interest in my schoolwork*), and Sense of Inadequacy at School

181   (two items, e.g., *I often have feelings of inadequacy in my university work*). Items are rated on a

182   6-point Likert-type scale ranging from *completely disagree* (1) to *strongly agree* (6), with

183   subscale scores calculated by summing the respective items. Scores range between 4 and 24 for

184   the Exhaustion subscale, 3 and 18 for Cynicism subscale, and 2 and 12 for the Inadequacy

185   subscale. Higher scores reflect higher levels of each construct (Salmela-Aro & Näätänen, 2005).

186   All items had references to '*school*' changed to '*university*' to reflect the university context in

187   this study. The SBI is correlated with academic achievement, and measures of depression and

188   engagement, demonstrating concurrent validity (Salmela-Aro et al., 2009). The SBI

189   demonstrated good internal consistency for subscales (α = .67 - .80; Salmela-Aro et al., 2009). In

190   the present study, the Exhaustion and Cynicism subscales demonstrated good internal

191   consistency (α = .81 and .85, respectively), but the internal consistency of the inadequacy

192   subscale was low (α = .54).

193   **Procedure**

194   This study was approved by the Curtin University Human Research Ethics Committee

195   (RDHS-91-16). Participants accessed the anonymous questionnaire online, whereby they viewed

196   a participant information document and provided informed consent before completing the

197   questionnaire, hosted through Qualtrics. Following questionnaire completion, participants were

198   presented with a debriefing document that outlined the purpose of the research and informed

199   them of where to find more information. Participants who required research participation for

200   their course were credited participation points for completing the survey.

Data analysis

The hypothesised model was tested using path analysis in Mplus. The significance values for both direct and indirect pathways were estimated with a 95% confidence interval using a bootstrapping procedure based on 1000 draws from the data. Modification Indices (MIs > 20, Hu & Bentler, 1999) were examined and theoretically defensible paths were freed. Goodness-of-fit was assessed using the chi-square statistic and degrees of freedom (Chi-square/df), Comparative Fit Index (CFI; values should be ≥0.95), Root Mean Square Error of Approximation (RMSEA; values should be ≤0.06), Tucker-Lewis Index (TLI; values should be ≥0.95), and Standardised Root Mean Square Residual (SRMR; values should be ≤0.08, Hu & Bentler, 1999). Although there was no significant correlation between age and gender and perfectionism, Repetitive Negative Thinking, and Academic Burnout, the model was run with and without the control variables of age and gender and the pattern of significant results did not change. Therefore results from the most parsimonious models without control variables are reported. The correlation between Perfectionistic Concerns and Strivings were controlled for, as were the correlations between burnout Exhaustion, Inadequacy, and Cynicism.

Results

Descriptive statistics and correlations between all variables of interest are summarised in Table 1. Correlations were generally in the expected directions and were small to moderate in magnitude. The present sample demonstrated scores that were consistent with the non-clinical samples in other studies for both perfectionism scales (Burgess et al., 2016), and Repetitive Negative Thinking (McEvoy et al., 2010). Scores were slightly higher for the School Burnout Inventory relative to the high school sample reported by Salmela-Aro and Näätänen (2005).

[Insert Table 1 about here]

Path Analysis Models

Initial Model. A test of the full model indicated a just-identified model, from which fit statistics were not produced (Supplementary Figure 1). In this model there were statistically significant direct positive effects of Perfectionistic Concerns on Repetitive Negative Thinking, Burnout Exhaustion, Burnout Inadequacy, and Burnout Cynicism. There was also a statistically significant direct effect of Repetitive Negative Thinking on Burnout Exhaustion and Burnout Inadequacy. Additionally, there were statistically significant direct positive effects of

233   Perfectionistic Strivings on Burnout Inadequacy and Burnout Cynicism. There was no direct

234   relationship between Perfectionistic Strivings and Repetitive Negative Thinking or Burnout

235   Exhaustion. There was also no direct relationship between Repetitive Negative Thinking and

236   Burnout Cynicism.

237   *Model 2*. A second model was run, without the non-significant pathways to test the most

238   parsimonious model. The path analysis revealed good model fit to the data $\chi^2/df = 1.07$, CFI =

239   .999, TLI = .995, RMSEA = .024 (90% CI = .000; .154), SRMR = .030 (see Figure 2).

240   *Direct pathways.* There were statistically significant direct positive effects of

241   Perfectionistic Concerns on Repetitive Negative Thinking, Burnout Exhaustion ($p < .001$),

242   Burnout Inadequacy ($p < .001$), and Burnout Cynicism ($p < .001$). There was also a statistically

243   significant direct effect of Repetitive Negative Thinking on Burnout Exhaustion ($p = .001$), and

244   Burnout Inadequacy ($p = .041$). Additionally, there were statistically significant direct positive

245   effects of Perfectionistic Strivings on Burnout Inadequacy ($p < .001$), and Burnout Cynicism ($p =$

246   .017).

247   *Indirect pathways.* There were significant indirect relationships between Perfectionistic

248   Concerns and Burnout Exhaustion ($\beta = .121$, $p = .003$, SE = 0.041, 95% CI = .055 - .190). No

249   other indirect pathways were observed. See Figure 2 for the final path analysis model with

250   standardised beta, standard error, and 95% confidence intervals for significant pathways.

251   [Insert figure 2 about here]

252   **Discussion**

253   The aim of the study was to investigate the relationship between perfectionism,

254   Repetitive Negative Thinking, and Academic Burnout. Consistent with previous research (e.g.,

255   Kljajic et al., 2017), Perfectionistic Concerns was independently associated with all three

256   elements of Academic Burnout among university students. These findings suggest that

257   Perfectionistic Concerns is an important predictor of Academic Burnout among university

258   students and represents a viable target for interventions aimed at reducing burnout in this

259   population. Previous research has demonstrated that cognitive-behavioural programs are

260   effective in reducing problematic Perfectionistic Concerns and that interventions specifically

261   targeting perfectionism can reduce various psychological symptoms, including eating disorder

262   symptoms, generalised anxiety, and depression (e.g., Rozental et al., 2017; Shafran et al., 2017;

263   also see Egan, Wade, & Shafran, 2011 for a review). Future studies should investigate whether

264 such interventions targeting Perfectionistic Concerns are similarly effective in reducing

265 Academic Burnout in university students. Not only would the results of such studies have

266 considerable practical utility, they would also further understanding of the causal nature of the

267 relationship between Perfectionistic Concerns and Academic Burnout.

268 Additionally, Repetitive Negative Thinking partially mediated the association between

269 Perfectionistic Concerns and Exhaustion. The indirect relationship between Perfectionistic

270 Concerns and Exhaustion via Repetitive Negative Thinking is broadly consistent with recent

271 research demonstrating that the relationship between perfectionism and various psychological

272 constructs, including burnout, is partially mediated by other variables such as motivation, self-

273 esteem, and coping styles (e.g., Chang, Lee, Byeon, & Lee, 2015; Luo, Wang, Zhang, Chen, &

274 Quan, 2016; Macedo et al., 2015). It is also consistent with findings that Repetitive Negative

275 Thinking is a risk factor for multiple psychological symptoms (McEvoy et al., 2013) and that it

276 mediates the relationship between perfectionism and various psychological outcomes (e.g., Flett

277 et al., 2011).

278 Furthermore, Repetitive Negative Thinking was also directly associated with burnout

279 Exhaustion and burnout Inadequacy. This highlights the importance of investigating the efficacy

280 of therapeutic programs targeting Repetitive Negative Thinking for students who have high

281 levels of Academic Burnout (particularly that characterised by Exhaustion) and high levels of

282 Perfectionistic Concerns. Repetitive Negative Thinking can be reduced through targeted

283 interventions (Watkins 2018), or through metacognitive therapy, and this is associated with

284 improvements in several measures of psychological distress (Johnson, Hoffart, Nordahl, &

285 Wampold, 2017; McEvoy, Erceg-Hurn, Anderson, Campbell, & Nathan, 2015) or through. The

286 importance of Repetitive Negative Thinking as a treatment for burnout would critically depend

287 upon whether any modification of a student's Repetitive Negative Thinking is also associated

288 with changes in their experiences of burnout. Future research should investigate the efficacy of

289 such programs in reducing burnout Exhaustion in university students. It is also important to

290 recognise the potential overlap between Repetitive Negative Thinking and depressive disorders

291 (Nolen–Hoeksema, 2000) and anxiety disorders (McEvoy et al., 2013). Although Repetitive

292 Negative Thinking can be considered a transdiagnostic process (Harvey, Watkins, Mensell, &

293 Shafran, 2004) and is related to burnout, it is unclear whether Repetitive Negative Thinking

294 better explains burnout relative to specific symptoms of depression and anxiety. As such, it

295 would be informative for future research to measure all of these constructs and investigate

296 whether they are independently associated with burnout.

297   Perfectionistic Strivings was associated with lower levels of Academic Burnout,

298 specifically Inadequacy and Cynicism. This is consistent with previous findings linking

299 constructs closely related to Perfectionistic Strivings (adaptive perfectionism and self-oriented

300 perfectionism) with lower burnout (Klajic et al., 2017; Zhang et al., 2007). This finding is also

301 consistent with the notion that Perfectionistic Strivings can be a beneficial form of perfectionism

302 (e.g., Stoeber & Childs, 2010). However, given evidence that Perfectionistic Strivings might

303 predict negative psychological outcomes in longitudinal studies (Smith et al., 2016), this

304 interpretation requires caution. Finally, Perfectionistic Strivings was not indirectly associated

305 with any aspect of Academic Burnout via Repetitive Negative Thinking. Somewhat surprisingly,

306 Perfectionistic Strivings was not associated with Repetitive Negative Thinking. This is

307 inconsistent with the results of Macedo and colleagues (2015), who demonstrated that

308 Perfectionistic Strivings predicts depression and fatigue through Repetitive Negative Thinking.

309 Consequently, the relationship between Perfectionistic Strivings and Repetitive Negative

310 Thinking requires further investigation.

311   Based on the current findings, it is plausible that reducing a students' concern regarding

312 mistakes (e.g., Perfectionistic Concerns), may help to reduce Academic Burnout. In many

313 interventions for perfectionism, it is not about reducing an individual's own standards, but rather

314 about promoting a healthy striving for excellence without the individual then basing their self-

315 worth on the striving for or achievement of their high goals (Egan, van Noort, et al., 2014;

316 Handley, Egan, Kane, & Rees, 2015; Egan, Wade et al., 2014). Nehmy and Wade (2015) have

317 also tested an intervention for perfectionism within schools that demonstrated improvements in

318 perfectionism, self-criticism, and negative affect at 6-months post intervention, with

319 improvements in perfectionism and self-criticism maintained at 12-months post intervention. As

320 Nehmy and Wade demonstrated some preventative effects through their school based

321 intervention, it may also be of use to evaluate whether such a program also provides some

322 preventative effects for academic burnout.

323   The findings of the present study should be interpreted within the context of the

324 limitations. First, the cross-sectional nature of the data precludes any conclusions regarding the

325 temporal order of the associations. Longitudinal research is clearly needed to address this.

326 Additionally, longitudinal data is required to address the possibility that the relationship between

327 Perfectionistic Concerns, Repetitive Negative Thinking, and Academic Burnout varies

328 depending upon the stage of a student's academic career. It is plausible that the relationship is

329 more pronounced at various time points in semester (e.g., before assignments or exams are due

330 versus after assessment deadlines) and future research should therefore further examine these

331 factors in future academic burnout research. Second, the sample was one of convenience and this

332 may limit the generalisability of the findings to the broader student population. Third, the

333 reliability of the Inadequacy subscale was low. Further psychometric assessment of this scale in

334 university samples is needed and findings in the current study related to burnout Inadequacy

335 should be interpreted with caution. Finally, Repetitive Negative Thinking is a theoretically

336 plausible mediator between perfectionism and Academic Burnout because it is a pathway

337 between perfectionism and depression (Flett, Coulter, Hewitt, & Nepon, 2011), post-traumatic

338 stress disorder (Egan et al., 2014), and psychological distress (Macedo et al., 2015). However,

339 Repetitive Negative Thinking is only one of many potential factors that might mediate the

340 relationship between perfectionism and Academic Burnout. Future research should examine

341 other potential mediators or moderators. For example, one potential possibility is academic

342 procrastination, which is positively related to Perfectionistic Concerns and negatively related to

343 wellbeing (Jadidi, Mohammadkhani, & Tajrishi, 2001; Steel, 2007). Additionally, individual

344 differences in factors such as imagery, emotion regulation, and coping can exert a strong

345 influence on psychological outcomes (Holmes, Geddes, Colom, & Goodwin, 2008). These

346 variables may be important to consider in the context of Academic Burnout in order to best

347 improve student outcomes.

348 **Conclusions**

349 Bearing the limitations in mind, the current study demonstrates that higher levels of

350 Perfectionistic Concerns are associated with greater experiences of Academic Burnout, both

351 directly and indirectly through increased Repetitive Negative Thinking in the case of burnout

352 Exhaustion. Repetitive Negative Thinking was also directly associated with burnout Exhaustion

353 and burnout Inadequacy. In contrast, higher levels of Perfectionistic Strivings are associated with

354 less Academic Burnout. Given that there are treatment programs which can effectively reduce

355 both Perfectionistic Concerns and Repetitive Negative Thinking (McEvoy et al., 2015; Rozental

356   et al., 2017), future research should focus on understanding the extent to which these programs

357   can alleviate Academic Burnout in university students.

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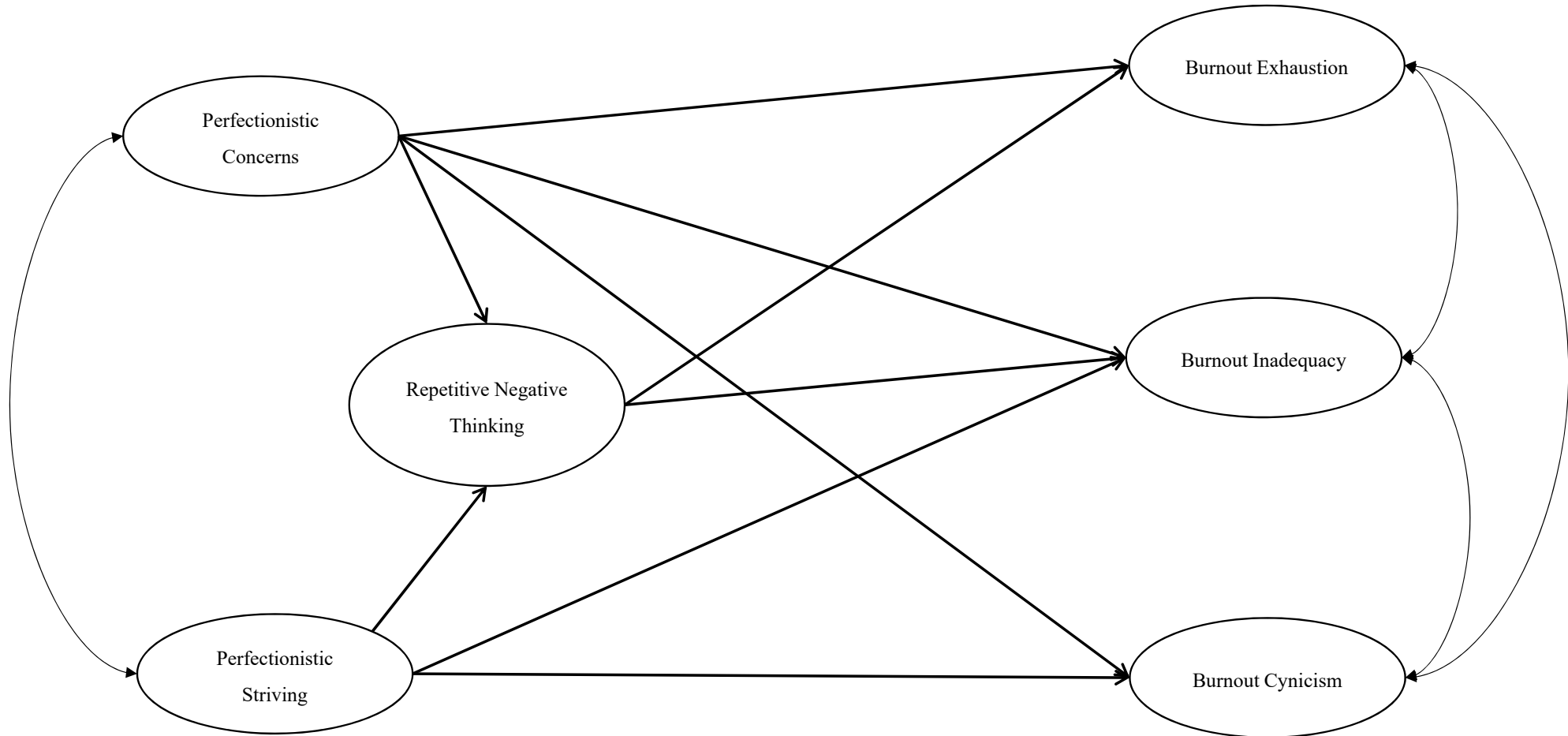
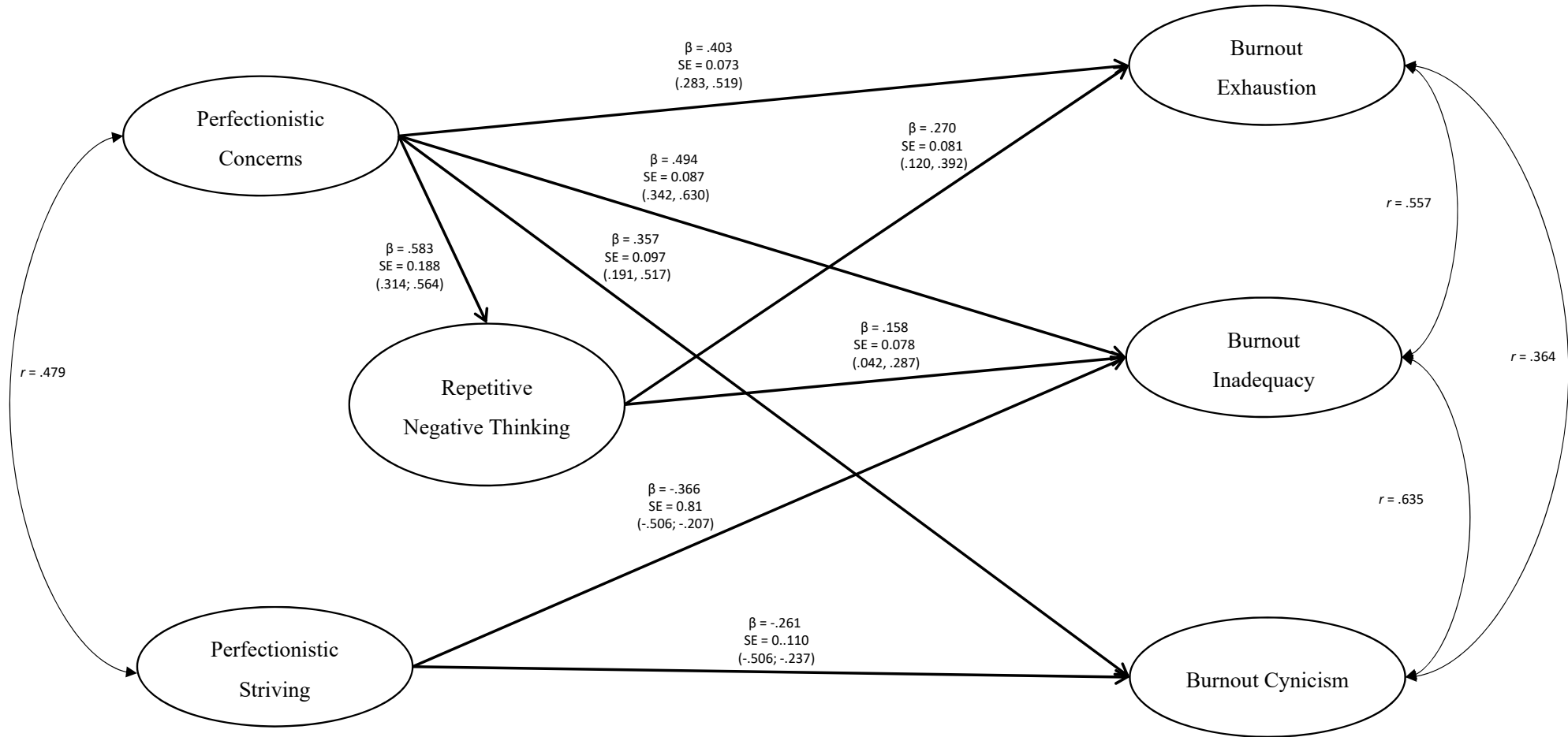
Hypothesised model

Complete hypothesised model of direct pathways between perfectionism, burnout, and indirect effects through repetitive negative thinking

Final tested model

Final tested model with only significant pathways between perfectionism, burnout, and repetitive negative thinking considered. Only significant pathways coefficients represented. All coefficients are standardized with 95% confidence intervals in brackets

β = .403
SE = 0.073
(.283, .519)

β = .270
SE = 0.081
(.120, .392)

β = .494
SE = 0.087
(.342, .630)

Perfectionistic
Concerns

Burnout
Exhaustion

β = .583
SE = 0.188
(.314; .564)

β = .357
SE = 0.097
(.191, .517)

r = .557

β = .158
SE = 0.078
(.042, .287)

Repetitive
Negative Thinking

Burnout
Inadequacy

r = .364

r = .479

β = -.366
SE = 0.81
(-.506; -.207)

r = .635

β = -.261
SE = 0..110
(-.506; -.237)

Perfectionistic
Striving

Burnout Cynicism

Descriptive Statistics and Correlation matrix of Perfectionism, Repetitive Negative Thinking, and Burnout Measures (N=126)

1   Table 1. *Descriptive Statistics and Correlation matrix of Perfectionism, Repetitive Negative Thinking, and Burnout Measures (N=126)*

Measure	Mean(SD)	α	1	2	3	4	5	6	7	8
1. Perfectionistic Concerns	11.25 (3.61)	.78	1	.48**	.45**	.52**	.23**	.38**	.01	.16
2. Perfectionistic Strivings	13.68 (3.76)	.88		1	.25**	.22**	-.10	-.11	.12	-.01
3. Repetitive Negative Thinking	34.94 (8.89)	.94			1	.48**	.22*	.35**	-.11	.06
4. Burnout Exhaustion	14.98 (4.60)	.81				1	.40**	.58**	-.01	.17
5. Burnout Cynicism	10.56 (4.11)	.85					1	.65**	-.06	.11
6. Burnout Inadequacy	7.54 (2.45)	.54						1	-.01	.12
7. Age	23.64 (7.86)	-							1	-.01
8. Gender	-	-								1

2   *p<.05; **p<.01