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Perfectionism, School Burnout, and School Engagement in Gifted Students:

The Role of Stress

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Abstract:

1
2 There is evidence that many gifted students set unrealistically high personal standards and that
3 such perfectionistic tendencies may lead to higher stress. To build on this evidence, we examined
4 whether performance perfectionism and school stress influence school burnout and school
5 engagement in gifted students. A sample of 342 gifted students ($M_{\text{age}} = 16.27$, $SD = 0.49$)
6 completed the study measures. Using structural equation modelling, we found that dimensions of
7 performance perfectionism indirectly predicted school burnout and engagement via school stress.
8 When gifted students reported that they expected themselves to perform perfectly at school, or
9 that others expected them to perform perfectly at school, they reported more school stress. In
10 turn, higher levels of school stress were related to increased school burnout and decreased school
11 engagement. The management of performance perfectionism and school stress is therefore
12 important when it comes to supporting and safeguarding gifted students.

13 *Keywords:* perfectionism; gifted; burnout; engagement

Introduction

1
2 Some students display exceptional ability to reason and learn and attain extremely high
3 levels of performance in their schoolwork. These students are labelled in various ways such as
4 ‘gifted’, ‘talented’, and ‘more able’ (Loft & Danechi, 2020). Here, we adopt the term ‘gifted’ and
5 refer to students: (a) whose potential for progress and attainment significantly exceed age-related
6 expectations; (b) have the potential to discover and develop their talents when provided with the
7 right opportunities; (c) require opportunities for enrichment and extension that go beyond those
8 provided in the standard national curriculum; and (d) are gifted in one or more subject area across
9 the curriculum (Subotnik et al., 2011; Pfeiffer, 2015). While intellectual ability plays a key role in
10 the development of gifted students, factors such as motivation, self-confidence, and coping skills
11 are important to consider (Rinn, 2024). One additional factor relevant to the development,
12 achievement, and overall school experience of gifted students is *perfectionism* (Grugan et al.,
13 2021; Hill & Madigan, 2022; Rice & Ray, 2018). In the present study, our aim is to better
14 understand the role that perfectionism in gifted students plays in influencing school stress and
15 two contrasting educational experiences – school burnout and school engagement.

Perfectionism and Gifted Students

17 Hewitt and Flett (1991) define perfectionism as a complex multidimensional personality
18 trait characterised by irrational and extreme requirements for perfection (Hewitt & Flett, 1991).
19 To capture the extent to which gifted students are perfectionistic towards their schoolwork, we
20 adopt an extension to Hewitt and Flett’s (1991) multidimensional model that focuses specifically
21 on *performance* (Hill et al., 2016). This model includes three distinct dimensions. *Self-oriented*
22 *performance perfectionism* refers to internally motivated beliefs that achieving perfect
23 performance is essential. *Socially prescribed performance perfectionism* refers to externally
24 motivated beliefs that achieving perfect performance is essential to be valued by others. Finally,
25 *other-oriented performance perfectionism* refers to internally motivated beliefs that it is essential
26 for others to achieve perfect performance. In context of the school environment, the

1 perfectionistic beliefs captured in this model relate to general academic performance and school
2 grades (e.g., “*I put pressure on myself to perfect my schoolwork and achieve perfect grades*”).
3 This specificity is important given that researchers have identified that schoolwork and
4 performance are central to the beliefs and behaviours of highly perfectionistic gifted students
5 (Speirs Neumeister et al. 2007; Speirs Neumeister, 2004).

6 There are two major reasons why the study of perfectionism has the potential to offer
7 insight into the experiences of gifted students. The first reason is the notion that many gifted
8 students are highly perfectionistic and often place unrealistically high personal standards on
9 themselves and their schoolwork (Margot & Rinn, 2016). Of note, in this regard, is Stricker et
10 al.’s (2020) meta-analytical review of 10 studies ($N = 4,340$) of perfectionism in gifted students.
11 Stricker and colleagues found evidence of higher levels of self-oriented perfectionism (and other
12 similar perfectionism dimensions such as personal standards) in gifted versus typically
13 developing students. Interestingly, Stricker and colleagues found no differences in socially
14 prescribed perfectionism (and other similar perfectionism dimensions such as concern over
15 mistakes) in gifted versus typically developing students. This pattern of results closely resembles
16 the meta-analytical findings of Ogurlu (2020) who also examined perfectionism levels across
17 these groups. When this evidence is considered, it is the tendency to strive for unrealistically high
18 standards that appears to be a common feature among many gifted students.

19 The second reason is that perfectionism is influential in relation to the motivation,
20 performance, and wellbeing of gifted students (Neihart & See Yeo, 2018). This influence is
21 evident from a recent systematic review by Grugan et al. (2021) of 36 studies ($N = 10,737$)
22 examining perfectionism in gifted students. The review found that dimensions of perfectionism
23 such as self-oriented perfectionism displayed a mixed pattern of relationships. This included
24 positive relationships with academic achievement and performance approach goals, for instance,
25 but also negative relationships with happiness and creativity. By contrast, dimensions of
26 perfectionism such as socially prescribed perfectionism were found to be problematic. This was

1 evident in a positive relationship with depressive symptoms and a negative relationship with self-
2 esteem. The evidence from this review shows the varied ways perfectionism dimensions might
3 influence the school experience of gifted students.

4 **Perfectionism and School Stress in Gifted Students**

5 One outcome that is highly relevant to perfectionism and experienced by many gifted
6 students is school stress (Henderson, 2011). In a longitudinal study tracking the stressors of gifted
7 students over an 11-year period, Peterson et al. (2009) found that school related stress was the
8 most frequently reported type of stress. The stressors in this category included worries over
9 college admission, academic competition with peers, and difficult classes (e.g., accelerated
10 learning classes). In addition to these worries, some gifted students also report concerns relating
11 to self-doubt, concerns over being different, and a preoccupation with proving their giftedness
12 (Henderson, 2011). While it is not clear if gifted students are more (or less) vulnerable to stress
13 than typically developing student groups, they do get stressed and there is potential for stress to
14 have destructive effects on their school experience (Haberlin, 2015).

15 One factor that might help to explain why some gifted students experience higher levels
16 of stress than others is perfectionism. According to Hewitt and Flett (2002), perfectionism can
17 lead to higher stress via several mechanisms. Applied to a school context, highly perfectionistic
18 students will *generate* stress via their unrealistic expectations (“*I expect to get the highest marks*
19 *in the class all of the time and for every subject.*”). This level of expectation inevitably creates a
20 discrepancy between the ideal self and the actual self, ultimately fuelling a profound sense of
21 failure (Hewitt et al., 2022). Highly perfectionistic students will also *anticipate* stress before any
22 failure has even occurred (“*If I fail this exam, I won’t get into any university.*”) and *perpetuate*
23 stress through rumination (“*No matter how hard I revise, I never achieve the marks that I want*”).
24 This means that stress is generated in advance of any potentially stressful event and prolonged
25 even after the event has passed. The final stress mechanism focuses on how the underlying
26 meaning and appraisals that perfectionism instils in failure *enhances* stress (“*If I don’t make the*

1 *grade, I am worthless.”*). That is, in attaching the attainment of perfection to self-worth and
2 belonging, highly perfectionistic students will have a greater sensitivity and reactivity to
3 perceived failure (Hewitt et al., 2022).

4 In support of Hewitt and Flett’s (2002) stress generation mechanisms, Einstein and
5 Lovibond (2000) found that self-oriented perfectionism and socially prescribed perfectionism
6 were positively correlated with school stress among students in general. In a study of gifted
7 students, Hill and Madigan (2022) also found evidence for the stress-generating potential of
8 specific perfectionism dimensions. Hill and Madigan found that both striving for perfection (a
9 dimension of perfectionism characterised by perfectionistic personal standards and self-oriented
10 striving for perfection) and negative reactions to imperfection (a dimension of perfectionism
11 characterised by negative affect in situations involving imperfection) were related to school
12 stress. However, after controlling for the overlap between the two perfectionism dimensions, it
13 was negative reactions to imperfection that uniquely predicted school stress. This dimension of
14 perfectionism is interesting in that it captures a style of responding to failure relevant across
15 different dimensions of perfectionism – including self-oriented performance perfectionism and
16 socially prescribed performance perfectionism (Hill et al., 2024). We might therefore expect
17 similar relationships when examining these dimensions of performance perfectionism.

18 **Beyond Stress: School Burnout and School Engagement in Gifted Students**

19 To move beyond Hill and Madigan’s (2022) study, it is important to consider outcomes
20 that may be associated with perfectionism and stress in gifted students. One outcome that has
21 been studied extensively in research on perfectionism and stress in other settings is *burnout* (Hill
22 & Curran, 2016). Burnout is evident in people who come to experience a previously enjoyable
23 activity as an aversive source of stress. In this regard, burnout has been described in some
24 contexts as “*motivation gone awry*” (Gould, 1996). In the school context (Salmela-Aro et al.,
25 2009), burnout is characterised by *exhaustion* (school-related feelings of chronic strain and
26 fatigue resulting from overtaxing schoolwork), *personal inadequacy* (diminished feelings of

1 competence and a lack of personal accomplishment in one's schoolwork), and *cynicism* (an
2 indifferent attitude toward schoolwork and its associated meaningfulness).

3 Researchers have found that perfectionism is related to burnout. However, there are very
4 few studies of perfectionism and school burnout. In Hill and Curran's (2016) meta-analysis of
5 perfectionism and burnout, only two of 43 studies examined the relationship in education, both of
6 which were in university students. Indicative of wider findings, these studies found that self-
7 oriented perfectionism (and high personal standards) were negatively related or unrelated to
8 school burnout, whereas socially prescribed perfectionism (and concerns over mistakes) were
9 positively related to school burnout (Shih, 2012; Y. Zhang et al., 2007). However, to date, no
10 study has examined the perfectionism-burnout relationship in gifted students. This is surprising
11 given that perfectionism has long been identified as a potential antecedent of burnout among
12 gifted students (e.g., Kaplan & Geoffroy, 1993). In addition, with more attention being given to
13 the phenomenon of "*gifted kid burnout*" (e.g., Small, 2022), it is important to identify which
14 dimensions of perfectionism may be risk factors for burnout among gifted students.

15 In addition to studying school burnout, it is important to study the conceptual opposite of
16 school burnout – *school engagement*. School engagement captures an altogether more positive
17 experience of school – one characterised as both positive and fulfilling. Based on Schaufeli's
18 conceptualisation (Schaufeli & Bakker, 2004; Schaufeli et al., 2002), school engagement is
19 defined as a state of mind characterised by *vigour* (a sense of energy and mental resilience while
20 studying and a willingness to invest effort in one's schoolwork), *dedication* (a sense of
21 significance, enthusiasm, inspiration, pride, and challenge in one's schoolwork), and *absorption*
22 (a sense of being fully concentrated and happily engrossed in one's schoolwork; Schaufeli &
23 Bakker, 2004). There is evidence in school and other contexts that stress is inversely related to
24 school engagement (e.g., Serrano et al., 2019). In this regard, stress may undermine the
25 perseverance, determination, will power, and positive energy that we often associate with gifted
26 students (Renzulli, 2012).

1 There is also evidence that perfectionism has relevance to school engagement (e.g.,
2 Damian et al., 2017; Kljajic et al., 2017; Shih, 2012). The evidence shows that self-oriented
3 perfectionism and other similar dimensions are consistently positively related to school
4 engagement, while socially prescribed perfectionism and other similar dimensions are typically
5 unrelated to school engagement. This evidence suggests that self-oriented perfectionism may
6 have the potential to energise school engagement, whereas socially prescribed perfectionism has
7 little to no impact on the engagement experiences of students. As with burnout, though,
8 researchers have not yet examined this potential in gifted students. By examining school
9 engagement, we can investigate whether dimensions of perfectionism that are risk factors for
10 more negative experiences in school (viz., burnout) also undermine the potential for more
11 positive experiences in school (viz., engagement).

12 **The Present Study**

13 For the first time in a study of gifted students, we examined whether dimensions of
14 performance perfectionism predict school burnout and engagement via school stress. Our first
15 hypotheses were that self-oriented performance perfectionism would positively predict school
16 stress and engagement, but negatively predict (or fail to predict) school burnout. By contrast,
17 socially prescribed performance perfectionism would positively predict school stress and burnout,
18 but negatively predict (or fail to predict) school engagement. We did not make any specific
19 hypotheses regarding other-oriented performance perfectionism as this dimension has previously
20 been ignored in research on stress, burnout, and engagement.

21 **Method**

22 **Participants**

23 A sample of 342 gifted students (117 males, 196 females, 29 gender not reported; $M_{\text{age}} =$
24 16.27, $SD = 0.49$, age range = 14 to 18) were recruited from a national conference for gifted
25 students hosted in Wales. On average, students had achieved 12.54 GCSE qualifications ($SD =$
26 1.44). Out of the GCSE qualifications attained, students reported an average of 5.68 ($SD = 2.18$)

1 top A* grades (now superseded by a numerical ‘grade 9’). For context, in 2023 the average
2 number of GCSE qualifications taken by students in England was 7.81 and only 0.1% took more
3 than 12 GCSE qualifications (Ofqual, 2023). In terms of achievement, an A* (or ‘grade 9’) is
4 awarded to students who have performed exceptionally well – usually in the top 5% (Christian,
5 2022). Thus, the current sample of students are some of the highest performing students in Wales
6 and the UK more broadly.¹

7 **Procedure**

8 Following institutional ethical approval, we recruited participants to complete our study
9 questionnaire. The participants were recruited at a national conference for gifted students and
10 those involved in their educational experience (e.g., teachers and academic support staff). Paper-
11 and-pencil questionnaires were distributed to students between sessions. Our aim was to recruit
12 the largest possible sample within the constraints of the conference event and achieve a total
13 sample size that satisfies (or at least closely approximates) minimum participant-to-parameter
14 ratio guidelines for structural equation modelling (SEM) analysis (5:1; Bentler & Chou, 1987).
15 Based on our hypothesised models (see Figure 1), the final total sample size ($N = 342$) was
16 considered acceptable for the planned analyses (6.72 participants for each distinct parameter to be
17 estimated per model). All participants who volunteered to take part provided informed consent.

18 **Measures**

19 **School performance perfectionism.** The Performance Perfectionism Scale (PPS; Hill et
20 al., 2016) was used to assess performance perfectionism. This 12-item scale assesses self-oriented
21 performance perfectionism (4-items, e.g., “*I put pressure on myself to perform perfectly*”),

¹ For more information on GCSE qualifications and the assessment and marking process, please see Ofqual’s (2022) guide for schools and colleges.

1 socially prescribed performance perfectionism (4-items, e.g., “*People view even my best*
2 *performances negatively*”), and other-oriented performance perfectionism (4-items, e.g., “*I am*
3 *never satisfied with the performances of others*”). We revised the instructions by asking
4 participants to think about their attitudes towards *school performance* (as opposed to sport
5 performance). When responding to items referring to others (e.g., “*People always expect my*
6 *performances to be perfect*”), participants were instructed to think about those involved in their
7 studies whose opinion they value highly (e.g., teachers, parents, and peers). The participants were
8 asked to rate how much they agree or disagree with each statement using a 7-point Likert scale (1
9 = *strongly disagree* to 7 = *strongly agree*). There is evidence to support the validity and reliability
10 of the PPS (e.g., Cronbach’s $\alpha \geq .70$; Hill et al., 2016).

11 **School Stress.** The short version of the Perceived Stress Scale (PSS-10; Cohen et al.,
12 1983) was used to assess levels of school stress. The scale includes 10-items that capture the
13 degree to which life has been unpredictable, uncontrollable, and overloaded during the previous
14 month (e.g., “*In the last month, how often have you felt difficulties were piling up so high that you*
15 *could not overcome them?*”). Participants were instructed to think about their experiences in
16 school and rate how often they experienced the feelings identified in each statement using a 5-
17 point Likert scale (0 = *never* to 4 = *very often*). There is evidence to support the validity and
18 reliability of the PSS-10 (e.g., Cronbach’s $\alpha \geq .74$; Lee, 2012).

19 **School burnout.** The School Burnout Inventory (SBI; Salmela-Aro et al., 2009) was used
20 to assess school burnout. This 9-item scale assesses exhaustion (4-items, e.g., “*I feel*
21 *overwhelmed by my schoolwork*”), cynicism (3-items, e.g., “*I feel a lack motivation in*
22 *schoolwork and often think of giving up*”), and inadequacy (2-items, e.g., “*I often have feelings of*
23 *inadequacy in my schoolwork*”). Participants were instructed to think about the last month and
24 rate how much they agree or disagree with each statement using a 6-point Likert scale (1 =
25 *completely disagree* to 6 = *completely agree*). There is evidence to support the validity and
26 reliability of the SBI (e.g., Cronbach’s $\alpha \geq .78$; Salmela-Aro & Upadyaya, 2020).

1 **School engagement.** The short Utrecht Work Engagement Scale - Student Version
2 (UWES-S; Schaufeli & Bakker, 2004) was used to assess school engagement. This 9-item scale
3 assesses vigour (3-items, e.g., “*When I’m doing my work as a student, I feel bursting with*
4 *energy*”), dedication (3-items, e.g., “*I am proud of my studies*”), and absorption (3-items, e.g., “*I*
5 *am immersed in my studies*”). Participants were instructed to think about the last month and rate
6 how often they experienced the feelings identified in each statement using a 7-point Likert scale
7 (0 = *never* to 6 = *always*). There is evidence to support the validity and reliability of the UWES-S
8 (e.g., Cronbach’s $\alpha \geq .70$; Schaufeli & Bakker, 2004).

9 **Data analysis**

10 The first stage of data analysis involved running a series of preliminary analyses
11 (evaluating missing data, screening for outliers, and computing descriptive statistics, bivariate
12 correlations, and reliability estimates). These analyses were conducted in IBM Statistics SPSS
13 28.0. The second stage of data analysis involved using SEM to examine whether performance
14 perfectionism predicts school burnout and engagement via school stress. These analyses were
15 conducted in *Mplus* 8.1 (Muthén & Muthén, 1998-2017).

16 **Hypothesised models**

17 We tested two models to examine whether dimensions of performance perfectionism
18 (exogenous variables) predict school burnout (endogenous variable in model one) and school
19 engagement (endogenous variable in model two) via perceived school stress (mediating
20 endogenous variable). In these models, the exogenous variables were measured using single item
21 indicators from the PPS (four self-oriented performance perfectionism items; four socially
22 prescribed performance perfectionism items, and four other-oriented performance perfectionism
23 items), the mediating endogenous variable was measured using paired and averaged item-parcel
24 indicators from the PSS-10 (five item-parcels for school stress), and the endogenous variables
25 were measured using subscale-level indicators from the SBI (three subscales for school burnout

1 in model one) or UWES-S (three subscales for school engagement in model two).² See Figure 1
2 for the primary relationships under investigation.

3 We followed Anderson and Gerbing's (1988) two-step approach to SEM. The first step
4 involved testing measurement models in which latent constructs were specified to covary. The
5 second step involved testing structural models in which theory-based relationships were specified
6 between the latent constructs. We also made a post-hoc decision to add gender (dummy-coded
7 male [0] *versus* female [1]) and age (years) as control variables.

8 To evaluate model fit we used multiple fit indices (*chi-square statistic* [χ^2], *comparative*
9 *fit index* [CFI], *root mean square error of approximation* [RMSEA], and *standardised root-*
10 *mean-square residual* [SRMR]). However, as χ^2 is oversensitive to sample size and minor model
11 misspecifications, we focused on the alternative fit indices specified. We considered whether the
12 models met criteria for acceptable (CFI > .90, RMSEA, SRMR < .08) or excellent (CFI > .95,
13 RMSEA, SRMR < .06) model fit (Marsh et al., 2004).

14 To evaluate the significance of the theory-based direct effects between the latent
15 constructs of interest in each structural model we used both a conventional alpha level ($\alpha = .05$)
16 and model-specific adjusted alpha levels. We adjusted alpha based on the number of direct
17 pathways specified between latent variables in each model ($k = 7$) and the average absolute
18 correlation for each latent variable with other latent variables in the model (r_j). An adjusted alpha
19 level was computed for each direct relationship across the two structural models. See Smith and
20 Cribbie (2013) for the Adjusted Bonferroni (AB2) correction formula for SEM.

21 To evaluate the significance of indirect effects we employed bias-corrected bootstrapping
22 with 5000 iterations (Hayes, 2009). In each model, we estimated the effect of the exogenous
23 variables (self-oriented, socially prescribed, and other-oriented performance perfectionism) on

² Item parcels for school stress (PSS-10 items 1 & 10, 2 & 7, 3 & 5, 4 & 9, and 6 & 8).

1 the endogenous variable (school burnout or school engagement) via the mediating endogenous
2 variable (school stress). In total, six indirect effects were estimated (three indirect effects per
3 model). Indirect effects were deemed significant if their bootstrapped 95% confidence interval
4 excluded the value of zero (Hayes, 2009).

5 **Results**

6 **Data Screening**

7 The missing value analysis identified 318 complete cases and 24 cases with at least one
8 item non-response. Cases with item non-response that exceeded 5% (3 or more items, $N = 1$) or
9 were missing multiple items from a specific subscale were removed ($N = 1$). The remaining
10 missing data was missing completely at random ($\chi^2 = 542.32$, $df = 543$, $p = .50$) and replaced
11 using the mean of non-missing items from relevant subscales. Subscales were then computed and
12 screened for univariate and multivariate outliers. Standardised z-scores greater than ± 3.29 ($p <$
13 $.001$, two-tailed) served as the indicator for univariate outliers, whereas a Mahalanobis distance
14 greater than $\chi^2(10) = 29.59$ ($p < .001$) was used as the criteria to identify multivariate outliers.
15 These evaluations resulted in a further four cases being removed from the study (final $N = 336$;
16 $M_{age} = 16.27$; $SD = 0.49$). Mardia's normalised coefficient for multivariate kurtosis was 4.02,
17 indicating that the data also satisfied the assumption of multivariate normality.

18 **Preliminary analyses**

19 The bivariate correlations show that self-oriented and socially prescribed performance
20 perfectionism shared small positive correlations with school stress, and small-to-moderate
21 positive correlations with measures of school burnout. Self-oriented perfectionism shared small
22 positive correlations with measures of school engagement. The only exception to this was a non-
23 significant relationship between self-oriented performance perfectionism and vigour. Socially
24 prescribed and other-oriented performance perfectionism were unrelated to all measures of school
25 engagement. School stress shared moderate-to-large positive correlations with measures of school

1 burnout and small-to-moderate negative correlations with measures of school engagement. See
 2 Table 1 for descriptive statistics and bivariate correlations.

3 We measured and reported reliability of all variables with greater than two items using
 4 Cronbach alpha (α) and McDonald omega (ω) estimates. The α and ω estimates are reported in
 5 Table 1 (α and $\omega = .67$ to $.85$). However, as the primary analyses involved the examination of
 6 latent variables, we also measured and reported composite reliability (ρ_c) estimates. All latent
 7 variables demonstrated acceptable levels of composite reliability ($\rho_c \geq .71$; Hair et al., 2020).

8 **Model one: Performance perfectionism, school stress, and school burnout**

9 **Measurement model.** The measurement component of model one provided acceptable fit
 10 to the data ($\chi^2 = 423.88$, $df = 160$, CFI = .90, RMSEA = .07 [.06, .08], SRMR = .06). The
 11 standardised factor loadings from indicator variables to corresponding latent variables were all
 12 significant ($p < .001$) and ranged from .30 to .87.

13 **Structural model.** The structural component of model one also satisfied the criterion for
 14 acceptable model fit ($\chi^2 = 451.83$, $df = 190$, CFI = .90, RMSEA = .06 [.06, .07], SRMR = .05).
 15 The findings show that the performance perfectionism variables in combination with the age and
 16 gender variables accounted for 35% variance in school stress, while the performance
 17 perfectionism variables in combination with the age, gender, and school stress variables
 18 accounted for 69% variance in school burnout.

19 **Direct effects.** The direct effects from the structural model are reported below and
 20 depicted in Figure 2. Self-oriented performance perfectionism ($a^1 = .25$, $SE = .08$, $p = .003$
 21 [adjusted $\alpha = .023$]) and socially prescribed performance perfectionism ($a^2 = .24$, $SE = .09$, $p =$
 22 $.008$ [adjusted $\alpha = .024$]), but not other-oriented performance perfectionism ($a^3 = .01$, $SE = .07$, $p =$
 23 $.929$ [adjusted $\alpha = .014$]), positively predicted school stress. In turn, school stress positively
 24 predicted school burnout ($b = .76$, $SE = .07$, $p < .001$ [adjusted $\alpha = .024$]). The direct pathways
 25 from each performance perfectionism dimension to school burnout (c^1 , c^2 , and c^3) were non-

1 significant. The interpretation of significance was consistent for each direct effect irrespective of
 2 the alpha value (conventional *versus* adjusted) used.

3 **Indirect effects.** The assessment of indirect effects in the structural model indicated that
 4 self-oriented performance perfectionism ($ab^1 = .19$, 95% CI = .07 to .34, $SE = .07$, $p = .005$) and
 5 socially prescribed performance perfectionism ($ab^2 = .18$, 95% CI = .05 to .31, $SE = .07$, $p =$
 6 .008) positively predicted school burnout via school stress. The indirect effect for other-oriented
 7 performance perfectionism on school burnout via school stress ($ab^3 = .00$, 95% CI = -.18 to .03,
 8 $SE = .05$, $p = .929$) was non-significant.

9 **Control variables.** We found that gender (but not age) was a significant predictor of
 10 stress ($\beta = .39$, $SE = .06$, $p < .001$). We investigated this difference using an independent samples
 11 t-test and found that the mean score for school stress ($M = 2.21$, $SD = 0.67$) reported by students
 12 who self-identified as female ($N = 195$) was higher than the mean score ($M = 1.66$, $SD = 0.64$)
 13 reported by students who self-identified as male ($N = 113$). The difference in means ($\Delta M = 0.54$)
 14 was statistically significant ($t_{(306)} = 6.99$, $p < .001$, 95% CI [0.39, 0.70]) and large (Hedges' $g =$
 15 0.83 [0.58, 1.06]). Neither gender nor age significantly predicted school engagement.

16 **Model two: Performance perfectionism, school stress, and school engagement**

17 **Measurement model.** The measurement component of model two provided acceptable fit
 18 to the data ($\chi^2 = 385.49$, $df = 160$, CFI = .91, RMSEA = .07 [.06, .07], SRMR = .06). The
 19 standardised factor loadings from indicator variables to corresponding latent variables were all
 20 significant ($p < .001$) and ranged from .29 to .87.

21 **Structural model.** The structural component of model two also satisfied the criterion for
 22 acceptable model fit ($\chi^2 = 409.38$, $df = 190$, CFI = .91, RMSEA = .06 [.05, .07], SRMR = .06).
 23 The findings show that the performance perfectionism variables in combination with the age and
 24 gender control variables accounted for 35% variance in school stress, while the performance
 25 perfectionism variables in combination with the age, gender, and school stress variables

1 burnout via school stress. No direct effects from the dimensions of perfectionism to school
2 burnout were evident. In the second model, we found that dimensions of perfectionism – self-
3 oriented performance perfectionism and socially prescribed perfectionism – negatively predicted
4 school engagement via school stress. The only direct effect evident was the positive effect of self-
5 oriented performance perfectionism on school engagement. No relationships involving other-
6 oriented perfectionism were statistically significant in either model.

7 **Performance Perfectionism, School Stress, and School Burnout**

8 In line with previous research on perfectionism in gifted students, we found that self-
9 oriented performance perfectionism and socially prescribed performance perfectionism positively
10 predicted school stress (Hill & Madigan, 2022). These findings suggest that gifted students with
11 higher levels of either of these two perfectionism dimensions may frequently perceive problems
12 in school as being overwhelming, outside their control, and difficult to overcome. Based on
13 previous research, problems that are relevant to gifted students involve worries over college
14 admission, academic competition with peers, and difficult classes (Peterson et al., 2009). While
15 these stressors are part of school life for all gifted students, the resultant stress is likely intensified
16 among those who are more perfectionistic in the demands they set for themselves or perceive
17 from others. This may be because they view learning as something that should (for them, at least)
18 be ‘fast and easy’ (Rimm, 2008). When this is not the case, perfectionistic tendencies such as
19 stringent self-evaluation and mistake rumination may exacerbate stress (Hewitt & Flett, 2002).

20 To build on this evidence, we examined the relationships between performance
21 perfectionism, school stress, and school burnout. In line with previous research in education, and
22 as expected, we found a non-significant direct relationship between self-oriented performance
23 perfectionism and school burnout (Shih, 2012; Y. Zhang et al., 2007). We did however find that
24 self-oriented performance perfectionism positively predicted school burnout via school stress.
25 This pattern of results is in-keeping with evidence suggesting that the debilitating potential of
26 self-oriented perfectionism is indirect. For example, in sport, Hill et al. (2008) found that self-

1 oriented perfectionism positively predicted athlete burnout via a lower sense of unconditional
2 self-acceptance. In context of the present study, the evidence suggests that this susceptibility to
3 burnout may apply to gifted students via more frequent experiences of school stress.

4 In line with previous research, we found evidence that socially prescribed performance
5 perfectionism positively predicted school burnout via school stress. Gifted students with higher
6 levels of socially prescribed perfectionism are likely to feel under intense pressure to meet
7 impossible expectations perceived from others (Hewitt & Flett, 1991). This pressure may come
8 from parents or teachers who are viewed as being hypervigilant to mistakes in schoolwork, quick
9 to criticise 'poor' grades, and insistent on gaining admission to only the most prestigious
10 universities (Webb et al., 2007). When gifted and highly perfectionistic students are unable to
11 meet unrealistic expectations from others, stress and symptoms of burnout are inevitable
12 (Henderson, 2011). In keeping with this idea, researchers have found that socially prescribed
13 perfectionism shares robust relationships with stress and burnout in students more broadly (e.g.,
14 Hill & Curran, 2016). This relationship makes sense given that burnout involves feelings of being
15 overworked, trapped, and incompetent, all of which are relevant to socially prescribed
16 perfectionism (Flett et al., 2022). Here, we extend this line of research by showing that socially
17 prescribed performance perfectionism is a key predictor of stress and burnout in gifted students.

18 We also examined the relationships between other-oriented performance perfectionism,
19 school stress, and school burnout. While researchers often omit other-oriented perfectionism from
20 their research, we feel that its inclusion is required to provide a complete test of perfectionism in
21 gifted students. In line with evidence from research with gifted students that suggests other-
22 oriented perfectionism has fewer personal consequences than the other perfectionism dimensions
23 (Speirs Neumeister et al., 2007), we found that other-oriented performance perfectionism was
24 unrelated to school stress and school burnout. To further evaluate the role that other-oriented
25 performance perfectionism plays in the burnout experiences of gifted students, it may be
26 important to examine *interpersonal stress*. In the school context, gifted students who are

1 extremely demanding of others are likely to experience impatience and frustration with peers and
2 teachers, especially if they are seen as interfering with learning and school performance
3 (Callahan, 2018). The interpersonal stress arising from making unrealistic demands of others may
4 better predict school burnout. Indeed, research in students more broadly shows that interpersonal
5 stress predicts school burnout (X. Zhang & Li, 2023).

6 **Performance Perfectionism, School Stress, and School Engagement**

7 In line with the view that self-oriented perfectionism might be energising for students, we
8 found evidence for a direct positive relationship between self-oriented performance perfectionism
9 and school engagement. This evidence aligns with previous research showing that self-oriented
10 perfectionism may come with some inadvertent academic benefits including increased
11 achievement, cognitive engagement, and satisfaction in school (e.g., Damian et al., 2017;
12 Gaudreau et al., 2016; Madigan, 2019). Such benefits are likely the result of the effort and
13 dedication that follows a strong need to maintain self-worth by avoiding appearing incompetent
14 relevant to others (Speirs Neumeister et al., 2015). While this may be the case, it is important to
15 note that we found that self-oriented perfectionism shared a negative indirect relationship with
16 school engagement via stress. This finding provides an important reminder that self-oriented
17 performance perfectionism includes a self-critical component that tends to (somewhat
18 paradoxically) undermine potential benefits that come with this dimension of perfectionism. In
19 this case, gifted students higher in self-oriented performance perfectionism may be highly
20 engaged in school but also vulnerable to stressful episodes that weaken engagement experiences.

21 The relationship between socially prescribed performance perfectionism and school
22 engagement was less complex. We found that socially prescribed performance perfectionism
23 shared a negative indirect relationship with school engagement via stress. The evidence shows
24 that higher levels of socially prescribed performance perfectionism may confer risk to heightened
25 school stress and subsequent diminished school engagement. Gifted students sometimes feel
26 stressed by the weight of expectation thrust on them by others (Pfeiffer & Stocking, 2000). This

1 pressure is likely to be further compounded when gifted students also have higher levels of
2 socially prescribed performance perfectionism. What may be key to the vulnerability in such
3 students is difficulties in coping with stress effectively. There is evidence in gifted students that
4 dimensions of perfectionism characterised by evaluative concerns (e.g., socially prescribed
5 perfectionism) are more strongly related to avoidance-oriented coping (internalising and
6 externalising) than they are to approach-oriented coping (problem solving and support seeking;
7 Mofield et al., 2016). It is possible that this heightened vulnerability to stress and inability to cope
8 effectively with difficulties is a combination that undermines the positive energy, will power, and
9 determination that characterises school engagement.

10 We also examined the relationships between other-oriented performance perfectionism,
11 school stress, and school engagement. In doing so, we found that other-oriented performance
12 perfectionism was unrelated to school stress and school engagement. This finding is difficult to
13 locate in the literature given the lack of evidence on relationships between other-oriented
14 perfectionism and engagement-related outcomes, especially within an educational context. Even
15 in the studies that do include other-oriented perfectionism, the evidence is inconsistent. For
16 example, in a workplace context, Childs and Stoeber (2010) found that other-oriented
17 perfectionism positively predicted work-based vigour but shared no meaningful relationships
18 with work-based dedication or absorption. There is also evidence supporting the potential for
19 other-oriented perfectionism to undermine engagement. For example, Stricker et al. (2019) found
20 that people higher in other-oriented perfectionism perceive daily life situations as low in
21 positivity (not fun, enjoyable, or pleasant) and duty (not requiring work, energy, or effort;
22 Stricker et al., 2019). Based on this mixed pattern of results, our findings, and the exclusion of
23 other-oriented perfectionism in research on young people more broadly, further research is
24 clearly required. While other-oriented performance perfectionism may play a more subdued role
25 in experiences of stress and engagement among gifted students, it may have an important role to
26 play in influencing other school experiences (e.g., anger and argumentative behaviour).

1 **Implications**

2 The findings suggest that vulnerability to stress may provide a basis for both increased
3 burnout and decreased school engagement among highly perfectionistic gifted students. This is a
4 significant problem given the performance, motivation, and wellbeing issues associated with
5 these outcomes (see Madigan & Curran, 2021; Martins et al., 2022; Walburg, 2014). With these
6 risks in mind, it will be important to increase knowledge about the features, causes, and
7 consequences of perfectionism among gifted students and those supporting their development.
8 This includes how to manage perfectionism related stress and when and how to seek help, if
9 needed. Schools should also consider the integration of psychoeducational interventions for
10 perfectionism as part of routine practice and curricula (e.g., Hill et al., 2021). These types of
11 support will help teachers, counsellors, and parents to facilitate open communications about
12 perfectionism and may better equip gifted students with the skills they need to handle school
13 stress. One important framework to help guide such efforts is the Peterson Proactive
14 Developmental Attention (PPDA) model (Peterson & Jen, 2018). One focus within PPDA-based
15 group discussions is to help gifted students make sense of the stressors they experience and
16 enhance communication regarding related concerns. We encourage consideration of this approach
17 and others (e.g., Olton-Weber et al., 2020) when seeking to improve preventative measures
18 within schools to support gifted students and manage perfectionism and stress.

19 **Limitations and Future Research Directions**

20 The present study has a few limitations that are important to consider. The first limitation
21 relates to using cross-sectional data to test for indirect relationships. The theories that underpin
22 our models are dynamic in nature – they describe processes that unfold over time (e.g.,
23 perfectionism underpinning experiences of chronic stress and subsequent burnout). This means
24 that cross-sectional data is unable to determine the extent to which relationships between study
25 variables reflect the influence one construct is likely to have on another *over time* (Maxwell &
26 Cole, 2007). Researchers should therefore build on our findings using longitudinal data. In

1 previous research of this kind, perfectionism has been found to predict longitudinal increases in
2 both stress and burnout (Childs & Stoeber, 2017).

3 The second limitation relates to the generalisability of our findings among gifted students.
4 Because we recruited participants from a national conference for gifted students, it is likely that
5 the sample is highly heterogenous. The school leaders who identified gifted students to invite to
6 this conference likely used a range of identification strategies (e.g., GCSE qualifications, teacher
7 assessment, and potential for achievement) and criteria (e.g., minimum three top A* grades
8 versus five top A* grades). While the sample all achieved high levels of success in their GCSEs,
9 we did not collect data on their specific interests, achievements, or personal backgrounds. This
10 means that future research is needed to identify variables that may impact or alter the
11 relationships identified in the present study. One key question that is relevant in this regard is
12 whether the results are applicable to gifted underachievers. The final limitation to note relates to
13 our decision to model total school burnout and total school engagement. Future research is
14 required to determine potential differences in how perfectionism and stress influence individual
15 symptoms of each school experience.

16 **Conclusion**

17 We examined whether dimensions of performance perfectionism predicted school burnout
18 and engagement via school stress in a sample of gifted students. We found that stress was a key
19 factor in the relationships from dimensions of performance perfectionism (self-oriented
20 performance perfectionism and socially prescribed performance perfectionism) to school burnout
21 and school engagement. The findings suggest that pressure for perfection in school performance
22 (self-imposed or perceived from others) is a potential risk factor for heightened stress and, in
23 turn, heightened stress is a potential risk factor for heightened school burnout and diminished
24 school engagement. The results are important as they highlight that managing perfectionism and
25 stress may be especially important when it comes to safeguarding positive motivation and
26 emotion toward schoolwork in gifted students.

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Table 1*Descriptive statistics, bivariate correlations, and reliability estimates*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|------------------------------------|--------|--------|------|---------|---------|---------|---------|---------|--------|--------|--------|-------|
| 1. SOPP | | | | | | | | | | | | |
| 2. SPPP | .43*** | | | | | | | | | | | |
| 3. OOPP | .11* | .28*** | | | | | | | | | | |
| 4. School Stress | .31*** | .29*** | -.02 | | | | | | | | | |
| 5. School Burnout | .26*** | .30*** | .05 | .64*** | | | | | | | | |
| 6. Exhaustion | .36*** | .28*** | -.02 | .64*** | .77*** | | | | | | | |
| 7. Cynicism | .11* | .19*** | .09 | .45*** | .86*** | .48*** | | | | | | |
| 8. Inadequacy | .20*** | .30*** | .04 | .51*** | .85*** | .48*** | .62*** | | | | | |
| 9. School Engagement | .13* | -.05 | .03 | -.32*** | -.48*** | -.22*** | -.55*** | -.40*** | | | | |
| 10. Vigour | -.02 | -.04 | .10 | -.37*** | -.48*** | -.30*** | -.50*** | -.37*** | .82*** | | | |
| 11. Dedication | .14* | -.07 | -.01 | -.26*** | -.40*** | -.17** | -.48*** | -.32*** | .86*** | .57*** | | |
| 12. Absorption | .19*** | -.01 | -.02 | -.19*** | -.35*** | -.10 | -.42*** | -.32*** | .85*** | .50*** | .63*** | |
| <i>M</i> | 5.12 | 3.82 | 2.02 | 1.99 | 3.24 | 3.36 | 3.01 | 3.35 | 3.26 | 2.63 | 3.91 | 3.22 |
| <i>SD</i> | 0.97 | 1.18 | 0.97 | 0.70 | 0.97 | 1.07 | 1.27 | 1.17 | 0.85 | 1.00 | 0.94 | 1.08 |
| Cronbach's Alpha (α) | .67 | .77 | .82 | .84 | .84 | .75 | .82 | ----- | .85 | .69 | .74 | .72 |
| McDonald's Omega (ω) | .68 | .77 | .82 | .84 | .83 | .76 | .82 | ----- | .84 | .70 | .75 | .73 |
| Composite Reliability (ρ_c) | .71 | .77 | .83 | .85 | .76 | ----- | ----- | ----- | .80 | ----- | ----- | ----- |

Note. SOPP = Self-oriented performance perfectionism; SPPP = Socially prescribed performance perfectionism; OOPP = Other-oriented performance perfectionism; Alpha (α) and omega (ω) for the inadequacy subscale of the School Burnout Inventory (SBI; Salmela-Aro et al., 2009) were not estimated because the number of items is less than three; The composite reliability for each latent factor under examination was calculated using factor loadings from the measurement models; $N = 336$; * $p < .05$. ** $p < .01$. *** $p < .001$.

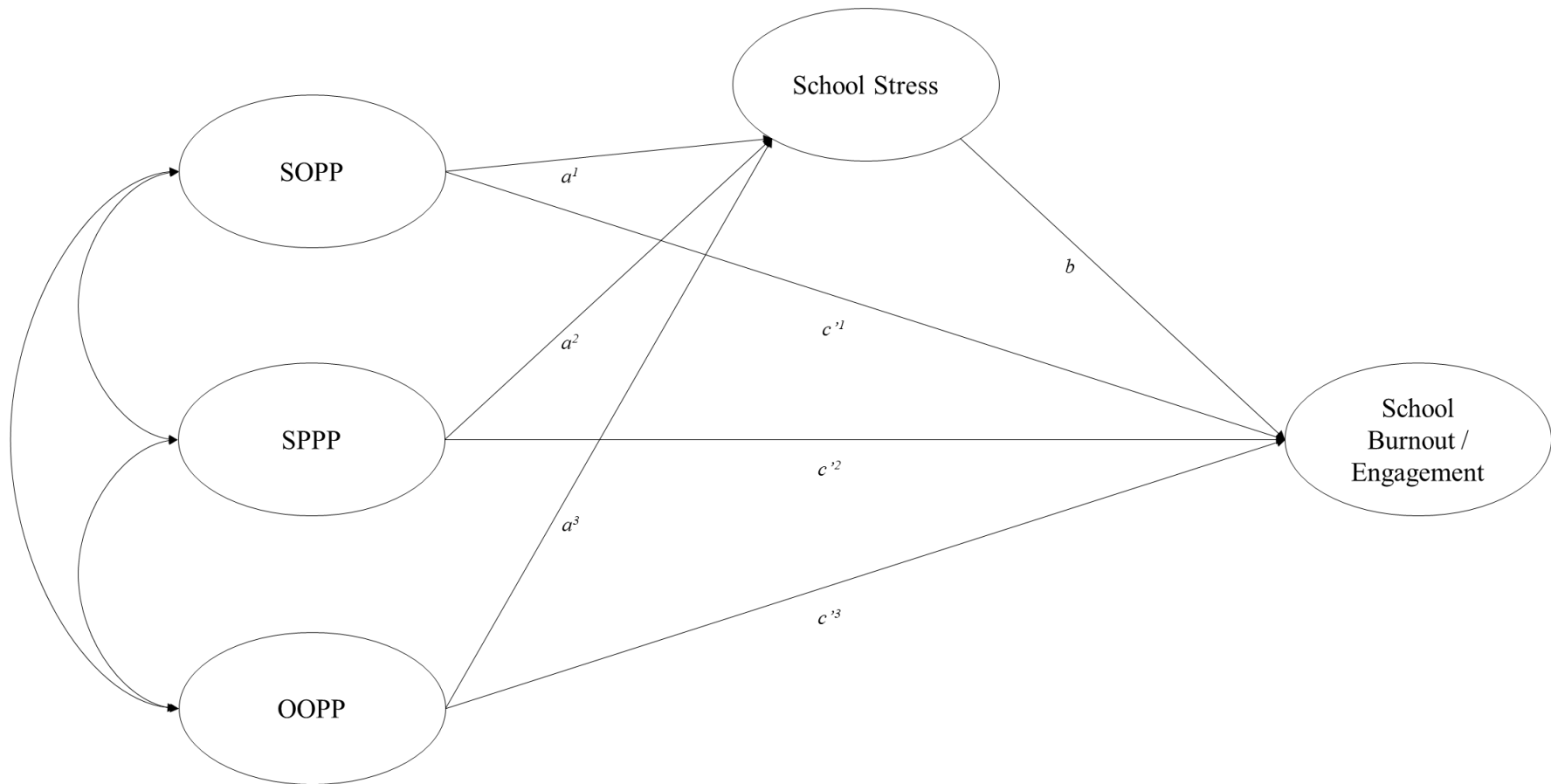


Fig. 1. Model 1 (M1) and Model 2 (M2): The relationships between performance perfectionism, school stress, and school burnout (M1) / school engagement (M2). *Note.* SOPP = Self-oriented performance perfectionism; SPPP = Socially prescribed performance perfectionism; OOPP = Other-oriented performance perfectionism.

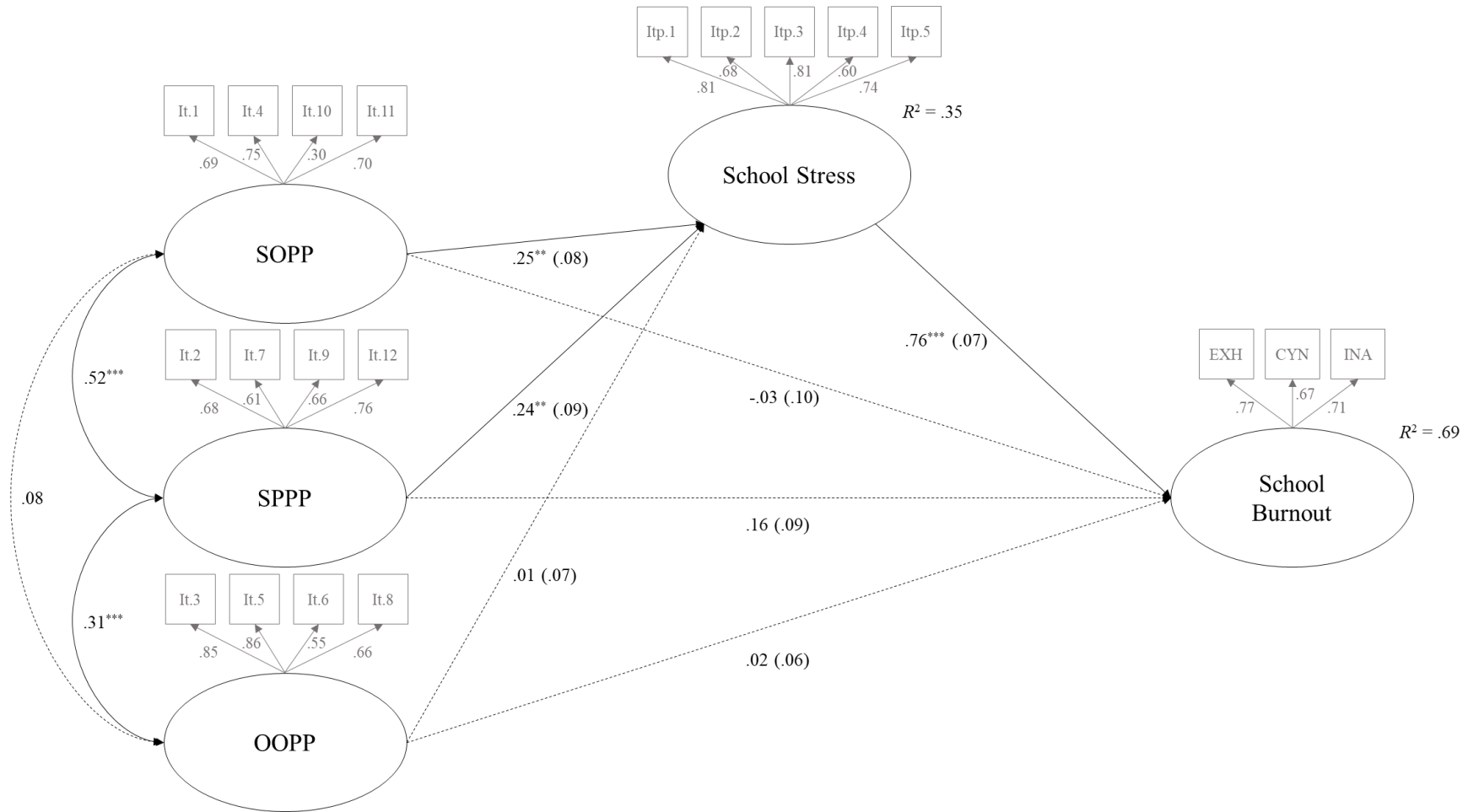


Fig. 2. Standardised direct effects from model (M1): The relationships between performance perfectionism and school burnout (via school stress). *Note.* SOPP = Self-oriented performance perfectionism; SPPP = Socially prescribed performance perfectionism; OOPP = Other-oriented performance perfectionism. It. = Item; Itp. = Item parcel. EXH = Exhaustion; CYN = Cynicism; INA = Inadequacy; All standardised factor loadings are significant ($p < .001$). The dummy-coded gender (0 = male; 1 = female) and age (years) control variables are not displayed. Standard errors are reported in parentheses; $N = 336$; * $p < .05$. ** $p < .01$. *** $p < .001$.

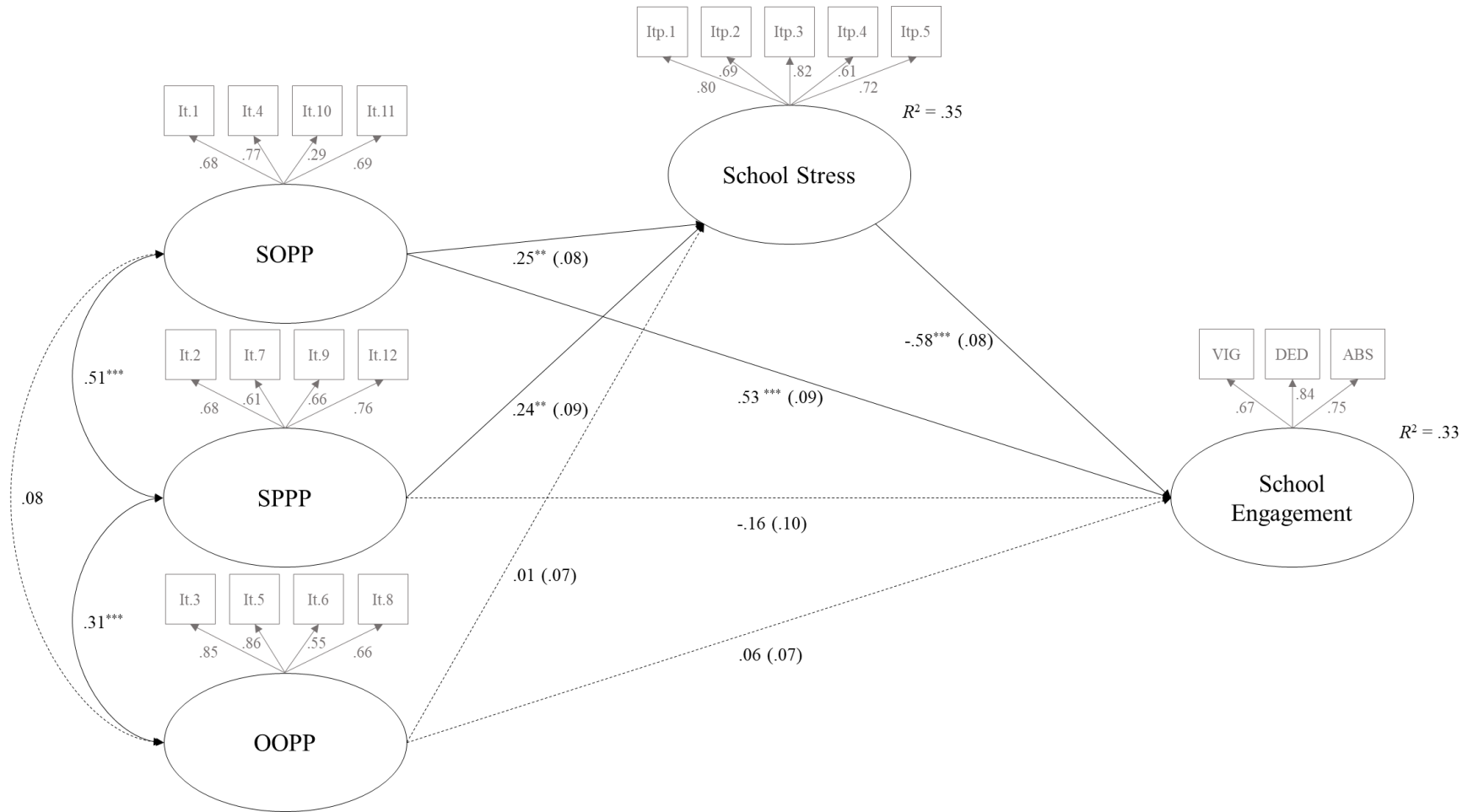


Fig. 3. Standardised direct effects from model (M2): The relationships between performance perfectionism and school engagement (via school stress). *Note.* SOPP = Self-oriented performance perfectionism; SPPP = Socially prescribed performance perfectionism; OOPP = Other-oriented performance perfectionism. It. = Item; Itp. = Item parcel. VIG = Vigour; DED = Dedication; ABS = Absorption; All standardised factor loadings are significant ($p < .001$). The dummy-coded gender (0 = male; 1 = female) and age (years) control variables are not displayed. Standard errors are reported in parentheses; $N = 336$; * $p < .05$. ** $p < .01$. *** $p < .001$.