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Perfectionism and Pre-Competition Emotions in Youth Footballers:

A Three-Wave Longitudinal Test of the Mediating Role of Perfectionistic Cognitions

Tracy C. Donachie, Andrew P. Hill, and Daniel J. Madigan

York St John University

Author Note

Tracy C. Donachie, Andrew P. Hill, and Daniel J. Madigan, School of Sport, York St John University, York, UK. This research is based on data collected for, and material contained in, the corresponding author's doctoral dissertation.

Correspondence concerning this article should be addressed to: Tracy C. Donachie, School of Sport, York St John University, York, UK. Email: t.donachie@yorksj.ac.uk.

Abstract

Perfectionism is related to pre-competition emotions in athletes. However, it is unclear why this is the case. In the present study, we sought to determine whether perfectionistic cognitions explain this relationship and mediate the relationships between self-oriented perfectionism (SOP), socially prescribed perfectionism (SPP), and general pre-competition emotions and multidimensional anxiety and anger. We adopted a three-wave longitudinal design and examined between- and within-person effects in a sample of 352 youth footballers (M_{age} = 14.03 years, *SD* = 2.30). At the between-person level, perfectionistic cognitions mediated the relationships between SOP, SPP and all general pre-competition emotions plus multidimensional anxiety and anger. At the within-person level, perfectionistic cognitions mediated the relationships between SOP, SPP, and general anxiety and anger plus multidimensional anxiety and anger. Our findings imply that athletes higher in SOP and SPP experience more anxiety and anger when the frequency of perfectionistic cognitions increases in the lead up to competition.

Keywords: adolescents, junior athletes, anxiety, anger, multi-level modelling

Introduction

Pre-competition emotions can result in better or worse performance (Beedie, Terry, & Lane, 2000). They are also part of an overall sporting experience for athletes that will influence their motivation and wellbeing (Nicholls, Polman, & Levy, 2012). It is therefore unsurprising that sport psychologists have sought to determine factors that result in more positive or negative pre-competition emotions. To advance knowledge on this topic, the present study examined the role of perfectionism in determining pre-competition emotions. In particular, we sought to establish whether perfectionism predicted pre-competition emotions in junior footballers and whether perfectionistic cognitions mediated this relationship over time.

Pre-Competition Emotions

Emotions are a complex combination of psychological, physiological, and behavioural reactions to personally meaningful events (Lazarus, 1991). According to cognitive-motivational-relational theory (Lazarus, 1991, 2000), emotions arise from the interdependent effects of primary and secondary appraisal processes. Primary appraisal is the assessment of whether a situation or an event is personally meaningful and salient to an athlete's goals and core values. Secondary appraisal is the assessment of the availability of coping resources and coping options. Different emotions are thought to arise due to different appraisal patterns and distinct underlying relational themes (Lazarus, 2000). Positive emotions occur when an individual feels he or she can cope with a personally meaningful situation and this assessment is accompanied by a relational theme of benefit (e.g., goal progress or ego enhancement). In contrast, negative emotions occur when an individual feels unable to cope with a personally meaningful situation and this assessment is accompanied by a relational theme of harm (e.g., a sense of threat, being demeaned or loss).

Pre-competition emotions refer to emotions that are experienced in the lead-up to, and immediately before, competition. Athletes can experience positive emotions such as excitement and happiness pre-competition. When an athlete experiences positive emotions prior to competition he/she is more likely to feel energized and prepared for competition (e.g., Cerin & Barnett, 2006). Athletes can also experience negative emotions such as anxiety, anger and dejection pre-competition. In contrast to when an athlete experiences positive emotion, when an athlete experiences negative emotions prior to competition he/she is more likely to feel distracted and ill-prepared for competition (e.g., Vast, Young, & Thomas, 2010).

Some pre-competition emotions have been more extensively studied than others. Anxiety is perhaps the most studied. Anxiety is defined as the subjective feeling of apprehension, worry, and tension caused by the appraisal of a situation as psychologically or physically threatening (Spielberger, 1972). It is typically studied from a multidimensional perspective with a distinction made between cognitive anxiety and somatic anxiety. Cognitive anxiety is the mental manifestation of anxiety involving worrying about upcoming performances and concerns about possible failure. By contrast, somatic anxiety is the bodily sensations and negative arousal that characterize anxiety such as “butterflies” in the stomach or an elevated heart rate (Morris, Davis, & Hutchings, 1981).

Anger is also a well-studied emotion in sport. Anger is defined as a strong feeling of annoyance, irritation, or hostility caused by the appraisal of a situation as harmful to self, unfair, or undeserved, or when highly desired goals are blocked (Lazarus, 1991). Like anxiety, anger is also typically studied as multidimensional. In this regard, anger can be measured via three dimensions: feelings of anger, verbal anger, and physical anger (Spielberger, 1991). Feelings of anger is the intensity of the emotional experience of anger. Verbal anger is the intensity of feelings related to the expression of anger verbally such as

shouting and swearing. Finally, physical anger is the intensity of feelings related to the expression of anger physically such as lashing out at others.

The influence of pre-competition emotions is complex. Very few pre-competition emotions will be problematic or beneficial for everyone in all circumstances. This is evident for anxiety, for example, in that the effects of pre-competition anxiety will depend on whether the level of anxiety experienced sits within an athlete's preferred optimal zone (see Hanin, 2000). Similarly, it is evident for anger in that the effects of pre-competition anger depends on whether the amount of anger aligns with the demands of the performance task (e.g., requires maximal force; Lane & Chappell, 2001). However, it is also clear that if anxiety and anger are experienced at high levels over time, or are not regulated effectively, they are likely to have negative implications for an athlete's performance and wellbeing. This is evident in research that suggests, for example, anxiety may co-occur with depression and substance abuse disorders (Brown & Barlow, 1992). Similarly, in the long-term anger has been linked to high blood pressure and coronary heart disease (e.g., Kitayama et al., 2015). As such, athletes need to be able to control their pre-competition emotions, especially negative pre-competition emotions, otherwise risk poorer performance and health.

Perfectionism and Pre-Competition Emotions

Researchers have sought to determine factors that may predispose athletes to the experience of certain emotions. One such factor is perfectionism. Perfectionism is a personality trait that is defined as a combination of exceedingly high standards and a preoccupation with harsh critical evaluations (Hewitt & Flett, 1991). While there are numerous models of perfectionism, there is consensus that it is best conceptualized as a multidimensional construct. Accordingly, the present study adopts Hewitt and Flett's (1991) multidimensional model of perfectionism so to focus on two dimensions of perfectionism and their relationship with pre-competition emotions: self-oriented perfectionism (SOP) and

socially prescribed perfectionism (SPP).[1] SOP is the setting of exacting standards for oneself and evaluating one's own behavior stringently and is a personal dimension of perfectionism. In contrast, SPP is the perception that unrealistically high standards are imposed on the self by others and is an interpersonal dimension of perfectionism. In this current study we focused on these dimensions as they manifest more locally, at domain-level, in sport.

SOP and SPP are important in the cognitive appraisal process and have clear theoretical links to emotions of athletes (see Hall & Hill, 2012). In this regard, SOP is complex. SOP includes a sense of control and agency over achievement and meaningful goals. It therefore has the potential to contribute to more positive pre-competition emotions (e.g., excitement; Donachie et al., 2018). However, SOP is also a vulnerability factor for more negative emotions (Flett & Hewitt, 2006). This is because SOP imbues competition with an irrational sense of importance that heightens a sense of threat and places strain on coping resources. In support of these assertions, SOP has been found to be positively related to general pre-competition anxiety (e.g., Donachie et al., 2018) and somatic anxiety in sport (e.g., Carter & Weissbrod, 2011). Direct evidence for its relationship with pre-competition anger has yet to be found but is possible as anger is triggered when important goals are thwarted (Lazarus, 1991).

SPP will also contribute to cognitive appraisal processes in a manner that competition is personally meaningful and highly important. However, because the goals associated with

[1]The model also includes a third dimension, other oriented perfectionism, which is the setting of exceedingly high standards for other people and is typically linked to interpersonal rather than personal consequences (Flett & Hewitt, 2002). It is not included here as this dimension is thought to be relevant mainly to interpersonal adjustment, rather than personal adjustment.

SPP are perceived to be externally imposed and referenced (the approval of others), those higher in SPP are more likely to perceive expectations to be uncontrollable and unjust, and less likely to feel able to cope with demands. In accord, research in sport has found SPP to be positively related to negative general pre-competition emotions (e.g. anger and dejection; Donachie et al., 2018). In regard to dimensions of anxiety, in some studies, SPP has been found to be positively related to both cognitive and somatic anxiety (e.g., Martinent & Ferrand, 2007), whereas other studies have found that SPP is positively related only to cognitive anxiety (e.g., Carter & Weissbrod, 2011). Unlike SOP, SPP has also displayed a positive relationship with pre-competition anger (Donachie et al., 2018).

The Mediating Role of Perfectionistic Cognitions

To extend research in this area we focus on perfectionistic cognitions as an explanatory mechanism for the relationships observed in previous research. Perfectionistic cognitions are automatic thoughts reflecting the need to be perfect (Flett, Hewitt, Blankstein, & Gray, 1998). They are a more state-like manifestation of perfectionism that capture a mental experience characterized by ruminative self-statements about the necessity for perfection (e.g., “Why can’t I be perfect?”; Flett et al., 1998). As a form of rumination, perfectionistic cognitions are activated by failure to reach important goals and an attentional shift towards the self and personal discrepancies as such their frequency depends on real-life demands (Prestele, & Altstötter-Gleich, 2018) and situation cues regarding perceived successes and failures (Martin & Tesser, 1989). Although these thoughts might be considered to have a motivational element, perfectionistic cognitions primarily serve the purpose of self-punishment, self-belittlement, and self-criticism (Flett, Hewitt, Nepon, & Besser, 2018). In accord, rather than energizing action, perfectionistic cognitions impede perceptions of coping resources and contribute to negative emotions (Flett et al., 2018).

Of interest to the current study, studies have found a positive relationship between perfectionistic cognitions and anxiety and anger, and that perfectionistic cognitions predict unique variance in anxiety and anger when controlling for SOP and SPP (e.g., Flett et al., 1998). Similar evidence exists in sport in relation to pre-competition emotions in athletes. Specifically, Donachie et al. (2018) recently found a positive relationship between perfectionistic cognitions and pre-competition anxiety, anger, and dejection. Furthermore, like outside of sport, perfectionistic cognitions predicted unique variance in the three emotions when controlling for SOP and SPP (Donachie et al., 2018). The latter finding alludes to the possibility that perfectionistic cognitions is one mechanism by which SOP and SPP contribute to the experience of more negative emotions (i.e., a mediator). There is also some evidence from research outside sport that suggests that perfectionistic cognitions mediate the relationship between perfectionism and general emotions (e.g., tension-anxiety and depression-dejection; Wimberley & Stasio, 2013). However, as yet, no studies have tested this possibility in sport or for pre-competition emotions.

As well as providing the first test of whether perfectionistic cognitions mediate the relationship between SOP, SPP and pre-competition emotions in athletes, we also sought to address two notable weaknesses in how mediation is typically examined in this area. Mediation consists of causal processes that unfold over time. However, most empirical tests of mediation use cross-sectional data that lacks the temporal component required to establish mediation. Furthermore, according to Curran and Bauer (2011), many theories articulate and claim to examine within-person processes—the responses of an individual in X (e.g., perfectionistic cognitions) over the course of several competitions and corresponding changes in Y (e.g., emotions)—but are largely studied using between-person analyses (i.e., position of an individual relative to other participants in the study, both at a given time point and over time; see Keijsers, 2016). This is the case for research that has examined the mediating

effects of perfectionistic cognitions between perfectionism and emotions so far (Wimberley & Stasio, 2013). To avoid these pitfalls, in the present study we adopted a three-wave longitudinal design and employed multi-level analytic techniques that allow for tests of mediation at both the between- and within-person levels (Selig & Preacher, 2009). We also, in doing so, acknowledge work highlighting fluctuations in the expression of personality characteristics, generally (e.g., Fleeson, 2001), and perfectionism specifically (e.g., Boone et al., 2012).

The Present Study

The present study had two aims: (i) to examine whether perfectionistic cognitions mediate the relationship between SOP, SPP and positive and negative general pre-competition emotions by examining between and within-person effects and (ii) to examine whether perfectionistic cognitions mediate the relationship between SOP, SPP and multidimensional anxiety and anger by examining between and within-person effects. Based on theory and previous research, we expected that perfectionistic cognitions would mediate the relationship between SOP and anxiety, excitement and multidimensional anxiety (cognitive and somatic) at both the within- and between-person levels, and that perfectionistic cognitions would mediate the relationship between SPP and anger, dejection and multidimensional anger (feel, verbal, and physical) at both the between- and within-person levels.

Method

Participants and procedure

A sample of 352 youth footballers was recruited from football academies, national squads, and clubs across Scotland and England. The mean age was 14.03 (SD = 2.30, range 9 to 19 years old) and the average length of sport participation was 8.34 (SD = 2.73). Following institutional ethical approval, parent/guardian consent and child assent was gained.

Participants completed the same multi-section questionnaire before competition at three different time points; Time 1 (T1; February/March 2017; *N* = 352), Time 2 (T2; 21 days later; *N* = 285) and Time 3 (T3; 21 days later, *N* = 262). The total length of the study was 6 weeks. The times at which questionnaires were completed coincide with mid-season to end of the season. It should be noted that across this period football academies have a degree of turnover of players due to releasing them from the academy and evaluating trialists. This partly explains the attrition across time points.[2]

Measures

The Child and Adolescent Perfectionism Scale (CAPS; Flett, Hewitt, Boucher, Davidson, & Munro, 1997). The CAPS is a measure of multidimensional perfectionism for use with children and adolescents and contains 22 items measuring self-oriented perfectionism (SOP; 12 items, e.g., "I try to be perfect in everything I do") and socially prescribed perfectionism (SPP; 10 items, e.g., "there are people in my life who expect me to be perfect"). Participants responded to each item on a 5-point scale (1 = *not at all true of me*, 5 = *very true of me*). The stem of the instrument was adapted to focus athletes on their participation in sport (i.e., "When practicing/playing football..."). Evidence for the validity and reliability of the scale has been provided by Hewitt, Caelian, Flett, Collins, and Flynn (2002). Researchers suggested that this scale has adequate psychometric properties when used to measure perfectionism dimensions in athletes (e.g., Appleton, Hall, & Hill, 2009).

[2]We conducted a Box's *M* tests to examine if the variance–covariance matrices showed any differences between those that completed measures on one occasion versus those that completed measures on multiple occasions. Because Box's *M* is highly sensitive to even minor differences, it is tested against a $p < .001$ significance level (Tabachnick & Fidell, 2007). This test was nonsignificant ($F = 1.38$, $p = .03$).

Perfectionistic Cognitions Inventory (PCI-10; Flett et al., 1998; Donachie et al., 2018). The PCI-10 is a short version of the original 25-item Perfectionistic Cognitions Inventory. Participants indicated how frequently they experienced different perfectionistic thoughts (e.g., "Why can't I be perfect?") over the last week on a 5-point scale (0 = *not at all*, 4 = *all of the time*). Evidence to support the validity and reliability of the initial scale was provided by Flett et al. (1998). Subsequently, the PCI-10 was developed and has been found to have a more discernably unidimensional structure (as intended by Flett et al., 1998) than the original version (see Donachie et al., 2018).

Sport Emotion Questionnaire (SEQ; Jones, Lane, Bray, Uphill, & Catlin, 2005). The SEQ is a 22-item measure of the emotions athletes commonly experience prior to competition. The SEQ examines five emotions which can be grouped into two higher-order dimensions: negative emotions (anxiety, anger, and dejection), and positive emotions (happiness and excitement). The participants were asked to indicate "how they feel right now, at this moment" in relation to their upcoming sports competition on a 5-point scale (0 = *not at all*, 4 = *extremely*). Evidence of the reliability and validity of the SEQ has been provided by Jones et al. (2005).

Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990). The CSAI-2 is a 27-item measure of pre-competitive state anxiety. The CSAI-2 examines three dimensions (i.e., cognitive anxiety, somatic anxiety, and self-confidence). The current study focused on anxiety, thus only the 18 items measuring anxiety were included, specifically: cognitive anxiety (9-items; e.g., "I am concerned I may not do as well in this competition as I could") and somatic anxiety (e.g., 9-items; "I feel tense in my stomach"). For each subscale, intensity level responses were scored on a 4-point scale (1 = *not at all* to 4 = *very much so*). Evidence for the reliability and validity of the CSAI-2 has been provided by Smith, Smoll, and Weichman (1998).

Reactions-to-Mistakes Anger Scale (RTM-Anger scale; Dunn et al., 2006). The RTM-Anger scale is a 15-item scale used to measure multidimensional pre-competition anger. The measure examines three dimensions of anger (5-items per dimension): Feeling Angry (e.g., "I feel angry"), Feel like Expressing Anger Verbally (e.g., "I feel like swearing"), and Feel like Expressing Anger Physically (e.g., "I feel like hitting someone"). Participants were asked how they felt right at that moment when thinking about making a mistake or playing poorly in the next game (see Dunn et al., 2006). Participants responded to each item on a 4-point scale (1 = *not at all* to 4 = *very much so*). Evidence for the reliability and validity of the RTM-Anger scale has been provided by Dunn et al. (2006).

Data Analyses

To examine whether perfectionistic cognitions mediated the perfectionism-emotions relationships, multilevel path analysis was employed with the measurement occasions (T1–T3) representing the within-person level, nested within participants (between-person level; Preacher, Zyphur, & Zhang, 2010; see also Madigan, Stoeber, & Passfield, 2016 for a recent example of this approach). Multilevel path analysis differentiates between the within- and between-person effects while testing mediation. The defining feature of multilevel modelling is the capacity to provide quantification and prediction of random variance due to multiple sampling dimensions (e.g., across competitions, across persons; Hoffman & Stawski, 2009). Robust Maximum Likelihood in Mplus 7.0 was used (Muthén & Muthén, 2012) to test the models accompanied by the mean-adjusted chi-squared test statistic. As recommended by Byrne (2013), the model fit was assessed using a combination of absolute and incremental fit indices as benchmarks for acceptable model fit: comparative fit index (CFI) > .90, Tucker-Lewis Index (TLI) > .90, root mean square error of approximation (RMSEA) < .10, and the standardized root mean square residual (SRMR) <.10, and for good model fit: CFI > .95, TLI > .95, RMSEA < .08; SRMR < .08. These cut-off values were used to deem the models as

acceptable. Additionally, a Monte Carlo method was used to test the indirect effects (Preacher & Selig, 2012). If the 95% confidence interval (CI) does not contain zero, the test can be considered significant at the $p < .05$ level (Hayes & Scharkow, 2013).

We tested two models. Model 1 examined whether perfectionistic cognitions mediated the relationship between perfectionism and pre-competition emotions (anxiety, anger, dejection, happiness, and excitement). Model 2 examined whether perfectionistic cognitions mediated the relationship between perfectionism and multidimensional anxiety (cognitive anxiety and somatic anxiety) and anger (feeling angry, verbal anger, and physical anger).

Results

Preliminary Analyses

Data were screened for inputting errors, outliers, and normality before the main analysis (see Tabachnick & Fidell, 2007). From an overall sample of 352 participants, 262 participants completed questionnaires at all three time points. Across the three time points, where questionnaire non-response accounted for missing data, the full information maximum likelihood (FIML) method for model estimation was used (Enders & Bandalos, 2001). Standardized z-scores ± 3.29 ($p < .001$) were used as criterion for univariate outliers. This procedure led to the removal of 11 participants' data. Next, we examined multivariate outliers, four participants with a Mahalanobis distance larger than the critical value of χ^2 (39) = 72.06 ($p < .001$) were removed. Thereafter, data were normally distributed. The final sample was 337 participants. Participants' mean age was 14.03 years old (SD = 2.27 years, range 10 to 19 years) and their average length of sport participation was 8.31 years (SD = 2.75, range 0 to 16 years). Descriptive statistics, measures of internal consistency, and bivariate correlations are reported in Table 1, 2 and 3. All scales demonstrated acceptable internal consistency ($\alpha > 0.70$; Nunnally & Berstein, 1994).

Multilevel Path Analysis

Interclass Correlations. To determine the amount of variance attributable to the between person effects, the intraclass correlations for each variable were calculated: SOP = .62, SPP = .67, PCI = .70, anxiety = .58, dejection .64, excitement = .57, anger = .60, happiness = .58, cognitive anxiety = .58, somatic anxiety = .61, feeling angry = .52, verbal anger = .65, and physical anger = .57. As a rule, data are suitable for multilevel path analysis when intraclass correlation coefficients are above .05 (Preacher et al., 2010).

General Pre-Competition Emotions (Model 1). We tested the model in Figure 1 using multilevel path analysis. The model provided acceptable model fit (χ^2 [20] = 102.86, scaling factor = 1.03, CFI = .96, TLI = .89, SRMRwithin = .05, SRMRbetween = .06, RMSEA = .07). In the between-person model, SOP and SPP positively predicted perfectionistic cognitions (medium-to-large effect sizes; Cohen, 1992). Perfectionistic cognitions positively predicted all emotions (small-to-large effect sizes). At within-person level, SOP and SPP significantly predicted perfectionistic cognitions and perfectionistic cognitions predicted anxiety and anger (small-to-medium effect sizes).

Multidimensional Anxiety and Anger (Model 2). We tested the model in Figure 2 using multilevel path analysis. The model provided acceptable fit (χ^2 [20] = 105.98, scaling factor = 1.02, CFI = .96, TLI = .88, SRMRwithin = .05, SRMRbetween = .06, RMSEA = .07). At between-person level, perfectionistic cognitions positively predicted both forms of anxiety and all three dimensions of anger (medium-to-large effect sizes). At within-person level, SOP and SPP predicted perfectionistic cognitions and perfectionistic cognitions predicted both forms of anxiety and all three dimensions of anger (small–to-medium effect sizes).

Indirect Effects

General Pre-Competition Emotions (Model 1). The between-person model showed that SOP had a positive and significant indirect effect on all emotions: anxiety (indirect effect

= .23, 95% CI = .13, .24); dejection (indirect effect = .22, 95% CI = .13, .24); excitement (indirect effect = .12, 95% CI = .04, .12; anger (indirect effect = .23, 95% CI = .12, .24); and happiness (indirect effect = .11, 95% CI = .03, .12). At the within-person level, SOP had a positive indirect effect on anxiety (indirect effect = .04, 95% CI = .01, .06) and anger (indirect effect = .03, 95% CI = .01, .03). The between-person model showed that both SPP had positive indirect effects on all variables: anxiety (indirect effect = .25, 95% CI = .11, .26), dejection (indirect effect = .25, 95% CI = .13, .28), excitement (indirect effect = .13, 95% CI =.06, .15), anger (indirect effect = .25, 95% CI = .17, .26) and happiness (indirect effect = .12, 95% CI = .09, .15). At the within-person level, SPP had a positive indirect effect on anxiety (indirect effect = .03, 95% CI = .01, .05) and anger (indirect effect = .02, 95% CI = .01, .03).

Multidimensional Anxiety and Anger (Model 2). In the between-person model, SOP had a positive indirect effect (via perfectionistic cognitions) on all dimensions of anxiety and anger: cognitive anxiety (indirect effect = .29, 95% CI = .17, .33); somatic anxiety (indirect effect = .22, 95% CI = .12, .25); feeling angry (indirect effect = .15, 95% CI = .04, .17); verbal anger (indirect effect = .15, 95% CI = .06, .16); and physical anger (indirect effect = .18, 95% CI = .010, .21). The within-person model showed that SOP had a positive and significant indirect effect (via perfectionistic cognitions) on all dimensions of anxiety and anger: cognitive anxiety (indirect effect = .06, 95% CI = .03, .08), somatic anxiety (indirect effect = .05, 95% CI = .02, .06), feeling angry (indirect effect = .04, 95% CI = .01, .06), verbal anger (indirect effect = .05, 95% CI = .01, .06) and physical anger (indirect effect = .05, 95% CI = .01, .05). The between-person model showed that both SPP had positive indirect effects on all variables: cognitive anxiety (indirect effect = .32, 95% CI = .19, .34); somatic anxiety (indirect effect = .24, 95% CI = .12, .25); feeling angry (indirect effect = .16, 95% CI = .06, .18); verbal anger (indirect effect = .16, 95% CI = .06, .17); and physical anger

(indirect effect = .20, 95% CI = .09, .21). The within-person model showed that SPP had a positive and significant indirect effect (via perfectionistic cognitions) on all dimensions of anxiety and anger: cognitive anxiety (indirect effect = .04, 95% CI = .01, .07), somatic anxiety (indirect effect = .03, 95% CI = .01, .05), feeling angry (indirect effect = .04, 95% CI = .01, .04), verbal anger (indirect effect = .05, 95% CI = .02, .06) and physical anger (indirect effect = .05, 95% CI = .01, .06).

Discussion

The aim of the current study was (i) to examine whether perfectionistic cognitions mediated the relationship between SOP, SPP and positive and negative general pre-competition emotions by examining between and within-person effects and (ii) to examine whether perfectionistic cognitions mediated the relationship between SOP, SPP and multidimensional anxiety and anger by examining between and within-person effects. It was hypothesized that perfectionistic cognitions would mediate the relationship between SOP and anxiety, excitement and multidimensional anxiety (cognitive and somatic) at both the within- and between-person levels, and that perfectionistic cognitions would mediate the relationship between SPP and anger, dejection and multidimensional anger (feel, verbal, and physical) at both the between- and within-person levels. In support of the hypotheses, the findings revealed that perfectionistic cognitions mediated the perfectionism–emotions relationship. However, a different pattern of relationships was found at the between- and within-person levels of analysis. At the between-person level, perfectionistic cognitions mediated the relationships between SOP, SPP and all general pre-competition emotions plus multidimensional anxiety and anger. At the within-person level, perfectionistic cognitions mediated the relationships between SOP, SPP and general anxiety and anger plus multidimensional anxiety and anger.

Perfectionism and pre-competition emotions

The current study provides the first clear evidence that perfectionistic cognitions mediate the relationship between perfectionism and general pre-competition emotions in sport. The same pattern was evident for both SOP and SPP where mediation was found at between-person level (all general pre-competition emotions) and within-person level (anger and anxiety). One striking element of these findings is how, via perfectionistic cognitions, a relationship can be observed between SOP and SPP and a wide array of pre-competition emotions at between-person level. These associations extend beyond those observed elsewhere with SOP previously linked to a limited mix of positive (excitement) and negative (anxiety) emotions and SPP previously linked to a limited set of just negative emotions (dejection and anger) (Donachie et al., 2018). Notably, then, the current findings suggest that the experience of greater perfectionistic cognitions implicate both SOP and SPP in the experience of other pre-competition emotions (relative to other people). However, importantly, it is only the within-person level that evidences the psychological processes presumed to be at work. In this case, only negative general pre-competition emotions (anger and anxiety) increase as SOP, SPP and perfectionistic cognitions increases over time (relative to one's own typical level). As such, this latter model provides the clearest picture of how SOP and SPP influence pre-competition emotions of junior athletes and signals that increases in anxiety and anger best characterize this relationship.

In terms of the multidimensional emotions of anxiety, again, a similar pattern of findings was evident for both SOP and SPP. However, unlike for general pre-competition emotions, perfectionistic cognitions mediated the relationship between SOP and SPP and cognitive and somatic anxiety at both between- and within-person levels. Previous research has evidenced relationships between these dimensions of perfectionism and anxiety to varying degrees inside of sport (e.g., Martinent & Ferrand, 2007). The extension provided here pertains to evidencing mediation for multidimensional pre-competitive anxiety and

doing so at within-person level. When paired with findings for general pre-competition anxiety, the findings support the proposal that perfectionistic cognitions are intertwined with appraisal processes in a manner that triggers heighten threat and subsequent anxiety. Again extending existing research, it also appears that the influence of perfectionistic cognitions is the same regardless of whether cognitive or somatic anxiety are considered as both increase prior to performance.

Perhaps the most novel finding pertains to multidimensional anger. Perfectionistic cognitions mediated the relationship between both SOP, SPP and multidimensional anger in the same way as observed for multidimensional anxiety, at both between- and within-person levels. Previous studies have found a positive relationship between SPP and pre-competition anger but little or no relationship between SOP and pre-competition anger (Donachie et al., 2018). Building on this research, then, we provide the first indication that perfectionistic cognitions mediate the relationship between SPP and anger, and that SOP (not just SPP) may also indirectly contribute to increased feelings of anger among junior athletes prior to competition. This is an important finding in regard to better understanding the emotions associated with SOP and illustrates how these associations would be overlooked if the experience of perfectionistic cognitions were not taken in to account. Like with multidimensional anxiety, we also provide the first evidence that no distinction is evident between the dimensions of anger experienced prior to competition suggesting that feelings of anger manifest broadly for both SOP and SPP.

Limitations and Future Research

The present study has several limitations. First, the study was observational. Although observational research can suggest causal relationships it cannot provide definitive evidence. Therefore, future research may benefit from employing experimental designs (e.g., manipulate performance contexts to evoke perfectionistic cognitions) in order to provide

stronger evidence for causality (Belli, 2009). Second, there was a large amount of attrition across the time points. This is expected to a degree given both the difficulty associated with longitudinal data collection and because football academies can have high turnover in players. This means that some groups may be overrepresented (e.g., players with the highest levels of ability) and others underrepresented in the study (e.g., players with lower levels of ability). This needs to be considered in regard to generalizability. Third, similarly, the present findings are restricted to junior athletes and may not generalize to adult athletes. This may be especially important as there is likely to be a larger within-person component in perfectionism during adolescence in comparison to adulthood where it would be expected to be more stable (e.g., Damian, Stoeber, Negru, & Băban, 2013). Fourth, the length of the study was short in regard to detecting within-person change in perfectionism. Here, we consider the changes meaningful in that variability in personality characteristics can be expected even over shorter periods of time (see Fleeson, 2002) and that changes in the degree to which characteristics such as perfectionism are endorsed are more likely to occur when measured at domain level (as opposed to global level). Plus, there is some evidence that some aspects of perfectionism do vary on a day-to-day basis (e.g., Boone et al., 2012) and that perfectionism can be induced experimentally/situationally (e.g., Boone, Soenens, Vansteenkiste, & Braet, 2012). Finally, we used self-report measures which may be subject to response bias (Althubaiti, 2016). It would be interesting for future studies to use additional measurement approaches such as physiological data (e.g., heart rate) to further explore these relationships.

Conclusion

This is the first study to examine whether perfectionistic cognitions act as a mediator between perfectionism and pre-competition emotions in sport at the between- and within-person levels. Perfectionistic cognitions were indeed found to mediate the relationship with differences evident at between- and within-person levels of analysis. Importantly, at a within-

person level, evidence was found to support the notion that as SOP and SPP increases so do perfectionistic cognitions and subsequent anxiety and anger (relative to a person's typical levels). Perfectionistic cognitions appear central to the emotions experienced by young footballers prior to competition.

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Table 1 Means, standard deviations and internal reliability for self-oriented perfectionism, socially prescribed perfectionism, perfectionistic cognitions, general pre-competition emotions and dimensions of anxiety and anger

	Time 1			Time 2			Time 3		
	M	*SD*	α	*M*	*SD*	α	*M*	*SD*	α
SOP	3.61	0.51	.75	3.48	0.54	.76	3.46	0.57	.78
SPP	2.41	0.66	.82	2.37	0.69	.87	2.38	0.69	.86
PCI-10	1.59	0.84	.87	1.57	0.91	.89	1.51	0.85	.88
Anxiety	1.28	0.91	.85	1.21	0.91	.86	1.16	0.94	.88
Dejection	0.38	0.63	.85	0.34	0.61	.88	0.39	0.64	.89
Excitement	2.58	0.81	.72	2.40	0.90	.78	2.35	0.94	.80
Anger	0.54	0.79	.84	0.49	0.75	.84	0.49	0.70	.81
Happiness	2.56	0.88	.80	2.50	0.95	.89	2.42	1.07	.90
Cognitive Anxiety	1.93	0.58	.84	1.97	0.65	.88	1.90	0.62	.87
Somatic Anxiety	1.71	0.53	.76	1.79	0.58	.82	1.77	0.59	.82
Feel Anger	2.10	0.84	.90	2.05	0.84	.90	2.05	0.80	.90
Verbal Anger	1.73	0.80	.89	1.73	0.82	.91	1.72	0.79	.91
Physical Anger	1.31	0.55	.87	1.31	0.58	.91	1.33	0.55	.90

Note. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism, PCI-10 = perfectionistic cognitions. Time 1 $N = 352$, Time 2 $N = 285$, Time 3 $N = 262$.

Table 2 Bivariate correlations for perfectionism, perfectionistic cognitions and general pre-competition emotions

	Time 1							Time 2							Time 3								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Time 1																							
1. SOP																							
2. SPP	.32**																						
3. PCI-10	.49**	.51**																					
4. Anxiety	.20**	.30**	.30**																				
5. Dejection	.04	.24**	.24**	.42**																			
6. Excitement	.19**	-.01	-.01	.14**	-.12*																		
7. Anger	.03	.27**	.27**	.37**	.83**	-.04																	
8. Happiness	.07	-.02	.10	.03	-.12*	.75**	-.08																
Time 2																							
9. SOP	.64**	.23**	.47**	.28**	.19**	.26**	.12	.16**															
10. SPP	.27**	.64**	.52**	.19**	.23**	-.01	.26**	-.03	.41**														
11. PCI-10	.41**	.43**	.73**	.27**	.29**	.10	.33**	.10	.52**	.55**													
12. Anxiety	.19**	.29**	.37**	.55**	.34**	.05	.26**	.03	.25**	.33**	.44**												
13. Dejection	.08	.23**	.34**	.22**	.61**	-.19	.50**	-.03	.13*	.35**	.39**	.50**											
14. Excitement	.14*	.07	.16**	.05	-.04	.55**	-.03	.54**	.24**	.02	.13*	.19**	.04										
15. Anger	.10	.28**	.32**	.20**	.54**	-.03	.58**	-.01	.14*	.37**	.39**	.47**	.86**	.04									
16. Happiness	.07	.09	.16**	-.02	-.04	.51**	-.04	.60**	.18**	.03	.13*	.11	.03	.77**	-.03								
Time 3																							
17. SOP	.59**	.23**	.47**	.27**	.15*	.20**	.07	.08	.68**	.26**	.47**	.24**	.07	.32**	.05	.19**							
18. SPP	.18**	.60**	.41**	.18**	.23**	-.05	.25**	-.09	.21**	.74**	.44**	.17**	.29**	.01	.29**	-.03	.29**						
19. PCI-10	.35**	.40**	.64**	.32**	.38**	.16*	.37**	.08	.43**	.49**	.72**	.35**	.32**	.19**	.30**	.18**	.55**	.52**					
20. Anxiety	.18**	.25**	.33**	.53**	.37**	-.10	.22**	-.10	.20**	.23**	.34**	.66**	.34**	.05	.25**	-.03	.29**	.30**	.41**				
21. Dejection	.02	.27**	.30**	.26**	.53**	-.23**	.42**	-.16*	.05	.29**	.30**	.33**	.69**	-.06	.56**	-.09	.02	.36**	.35**	.43**			
22. Excitement	.14*	.07	.25**	.05	.00	.51**	-.01	.49**	.28**	-.00	.26**	.15	.03	.66**	.04	.58**	.30**	-.03	.33**	.12	-.05		
23. Anger	-.02	.25**	.27**	.26**	.50**	-	.50**	-.14*	.05	.31**	.31**	.32**	.65**	-.05	.65**	-.08	.05	.37**	.39**	.41**	.87**	-.05	
24. Happiness	.15**	.13*	.25**	-.02	-.07	.46**	-.01	.56**	.23**	.05	.26**	.10	.02	.54**	.02	.64**	.23**	-.03	.22**	.05	.00	.77**	-.02

Note. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism, PCI-10 = perfectionistic cognitions, $^{*}p < .05$, $^{**}p < .01$, two-tailed. Time 1 N = 352, Time 2 N = 285, Time 3 N = 262.

Table 3 Bivariate correlations for perfectionism, perfectionistic cognitions and multidimensional anxiety

	Time 1					Time 2					Time 3			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Time 1														
1. SOP														
2. SPP	.32**													
3. PCI-10	.49**	.51**												
4. Cognitive Anxiety	.32**	.32**	.46**											
5. Somatic Anxiety	.16**	.30**	.37**	.66**										
Time 2														
6. SOP	.64**	.23**	.47**	.32**	.21**									
7. SPP	.27**	.64**	.52**	.22**	.18**	.41**								
8. PCI-10	.41**	.43**	.73**	.37**	.30**	.52**	.55**							
9. Cognitive Anxiety	.24**	.36**	.45**	.60**	.48**	.34**	.37**	.49**						
10. Somatic Anxiety	.17**	.30**	.35**	.40**	.62**	.21**	.29**	.39**	.67**					
Time 3														
11. SOP	.59**	.23**	.47**	.28**	.15*	.68**	.26**	.47**	.26**	.14*				
12. SPP	.18**	.60**	.41**	.22**	.19**	.21**	.73**	.44**	.30**	.22**	.29**			
13. PCI-10	.35**	.40**	.64**	.33**	.29**	.43**	.49**	.72**	.38**	.31**	.55**	.52**		
14. Cognitive Anxiety	.22**	.34**	.42**	.49**	.46**	.23**	.31**	.41**	.61**	.44**	.34**	.44**	.53**	
15. Somatic Anxiety	.14*	.28**	.36**	.33**	.57**	.16*	.27**	.37**	.48**	.65**	.18**	.34**	.41**	.69**

Note. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism, PCI-10 = perfectionistic cognitions, $^{*}p < .05$, $^{**}p < .01$, two-tailed. Time 1 $N = 352$, Time 2 $N = 285$, Time 3 $N = 262$.

Table 4 Bivariate correlations for trait perfectionism, perfectionistic cognitions and multidimensional anger

	Time 1						Time 2						Time 3					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Time 1																		
1. SOP																		
2. SPP	.32**																	
3. PCI-10	.49**	.51**																
4. Feel Anger	.28**	.15**	.25**															
5. Verbal Anger	.28**	.24**	.31**	.67**														
6. Physical Anger	.17**	.29**	.32**	.55**	.73**													
Time 2																		
7. SOP	.64**	.23**	.47**	.29**	.23**	.20**												
8. SPP	.27**	.64**	.52**	.13*	.23**	.26**	.41**											
9. PCI-10	.41**	.43**	.73**	.23**	.25**	.26**	.52**	.55**										
10. Feel Anger	.25**	.09	.21**	.51**	.37**	.28**	.36**	.15**	.29**									
11. Verbal Anger	.24**	.15*	.24**	.41**	.65**	.47**	.26**	.19**	.30**	.62**								
12. Physical Anger	.13*	.20**	.25**	.28**	.47**	.57**	.20**	.27**	.33**	.51**	.70**							
Time 3																		
13. SOP	.59**	.23**	.47**	.27**	.24**	.18**	.68**	.26**	.47**	.30**	.20**	.14*						
14. SPP	.18**	.60**	.41**	.08	.17**	.21**	.21**	.73**	.44**	.02	.10	.18**	.29**					
15. PCI-10	.35**	.40**	.64**	.19**	.22**	.24**	.43**	.49**	.72**	.19**	.20**	.21**	.55**	.52**				
16. Feel Anger	.23**	-.02	.14*	.46**	.35**	.21**	.30**	.04	.17**	.61**	.45**	.26**	.37**	.01	.24**			
17. Verbal Anger	.17**	.12	.15*	.35**	.56**	.39**	.18**	.15*	.20**	.41**	.71**	.48**	.26**	.12*	.24**	.65**		
18. Physical Anger	.13*	.20**	.23**	.30**	.51**	.55**	.24**	.25**	.28**	.33**	.55**	.57**	.17**	.22**	.33**	.48**	.74**	

Note. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism, PCI-10 = perfectionistic cognitions, * $p < .05$, ** $p < .01$, two-tailed. Time 1 $N = 352$, Time 2 $N = 285$, Time 3 $N = 262$.

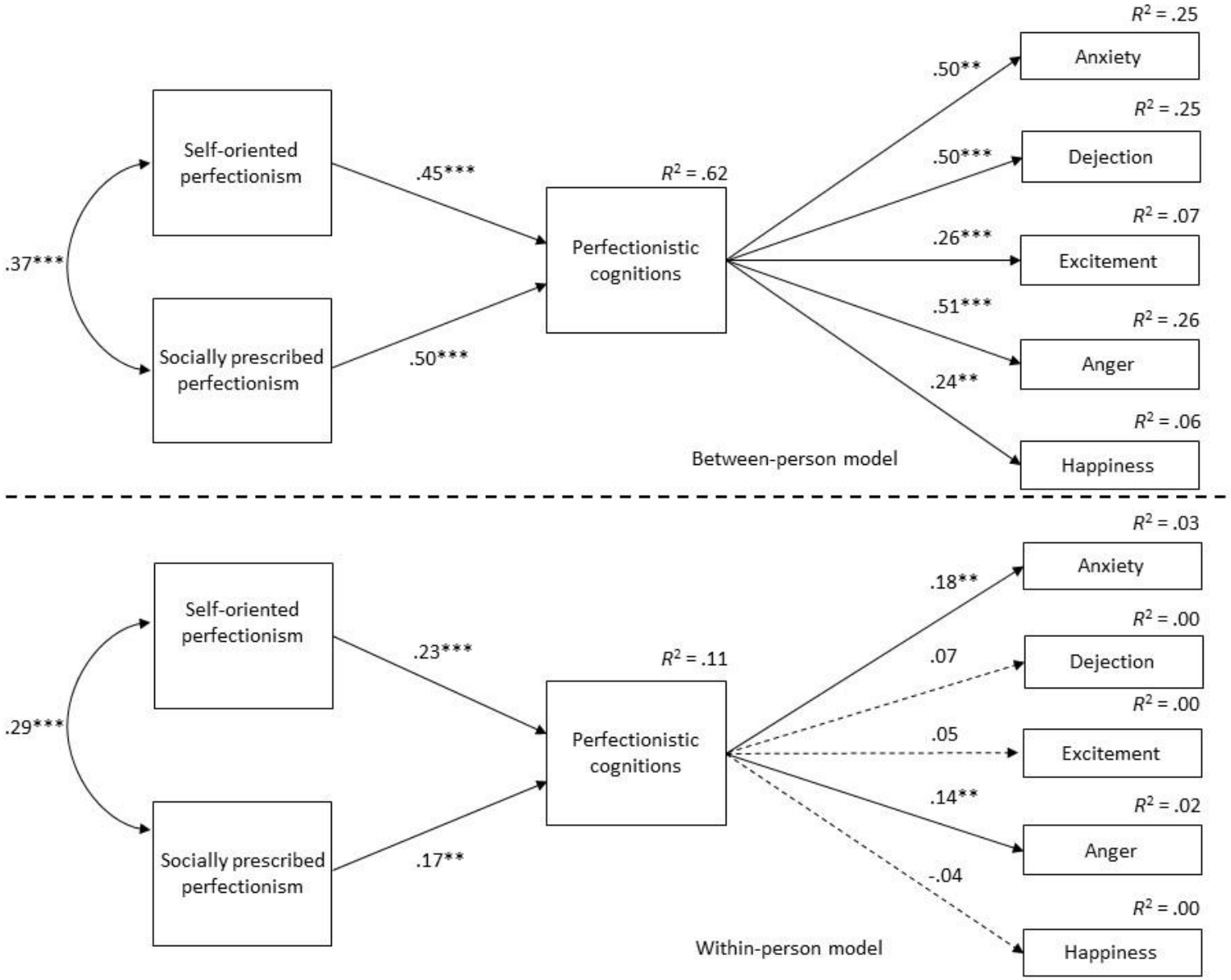

Figure 1. Perfectionism, perfectionistic cognitions, and general pre-competition emotions (Model 1). Multilevel structural equation model (N = 2 337; sample size differs depending on which wave is examined). Path coefficients are standardized. Dashed paths are non-significant ($p > .05$). 3 *$p <$ .05. **$p < .01$. ***$p < .001$.

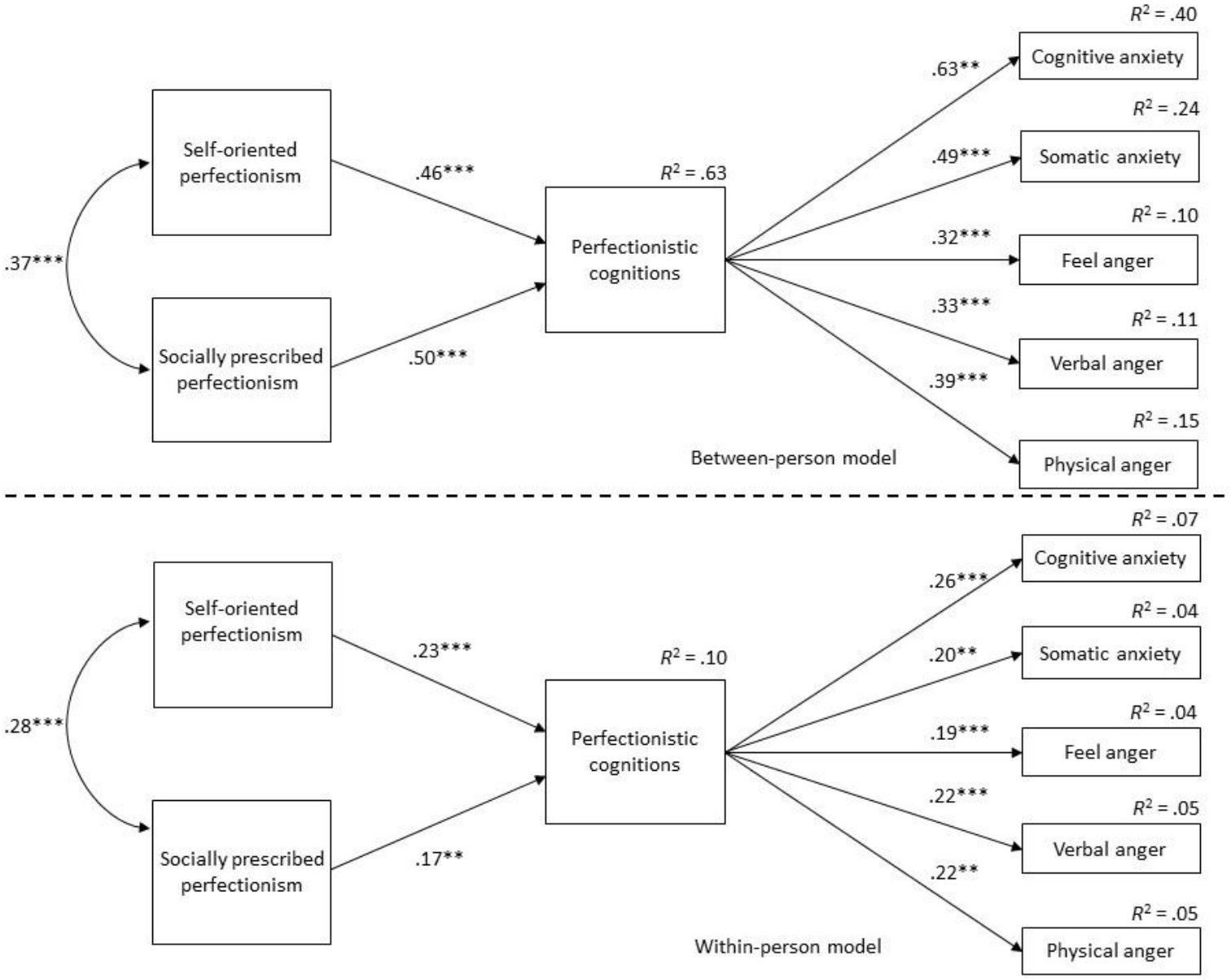

Figure 2 Perfectionism, perfectionistic cognitions, and multidimensional anxiety and anger (Model 1). Multilevel structural equation model (N = 2 337; sample size differs depending on which wave is examined). Path coefficients are standardized. Dashed paths are non-significant (p > .05). 3 *p < .05. **p < .01. ***p < .001.