Development of Perfectionism in Junior Athletes:

A Three-Sample Study of Coach and Parental Pressure

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Abstract

Perfectionism predicts cognitions, emotions, and behaviors in sport. Nonetheless, our understanding of the factors that influence its development is limited. We sought to address this issue by examining the role of coach and parental pressure in the development of perfectionism in sport. Using three samples of junior athletes (16-19 years; cross-sectional: $N = 212$; 3-month longitudinal: $N = 101$; 6-month longitudinal: $N = 110$), we examined relations between coach pressure to be perfect, parental pressure to be perfect, perfectionistic strivings, and perfectionistic concerns. Mini meta-analysis of the combined cross-sectional data ($N = 423$) showed that both coach pressure and parental pressure were positively correlated with perfectionistic strivings and perfectionistic concerns. In contrast, longitudinal analyses showed that only coach pressure predicted increased perfectionistic strivings and perfectionistic concerns over time. Overall, our findings provide preliminary evidence that coaches may play a more important role in the development of junior athletes' perfectionism than parents.

Keywords: perfectionism; longitudinal; development; coach; parents; junior athletes

Introduction

Research has found that perfectionism is related to numerous motivational, performance, and wellbeing-related outcomes in sport (see Hill, Mallinson-Howard, & Jowett, 2018). This includes important outcomes such as behavioral regulation, performance, and athlete burnout. The origins of perfectionism in sport, however, are less clear. Theoretical accounts of the development of perfectionism identify parental pressure to be perfect as one origin of perfectionism (Flett, Hewitt, Oliver, & Macdonald, 2002). More recently, in the domain of sport, these accounts have been extended to include coach pressure (Appleton & Curran, 2016). Against this backdrop, the aim of the present study was to examine the extent to which pressure to be perfect from parents and coaches showed cross-sectional and longitudinal relationships with perfectionism in junior athletes.

Perfectionism

Perfectionism is defined as a personality characteristic that involves setting exceedingly high standards of performance which are accompanied by tendencies for overly critical evaluations of behavior (Frost, Marten, Lahart, & Rosenblate, 1990). Like broad personality characteristics, perfectionism is considered trait-like and develops in childhood and adolescence but also shows changes over the life span (e.g., Landa & Bybee, 2007). The current consensus is that perfectionism is comprised of two higher-order dimensions. The first, *perfectionistic strivings,* encompass perfectionist personal standards and a self-oriented striving for perfection. The second, *perfectionistic concerns,* reflect concerns about making mistakes, feelings of discrepancy between one's standards and performance, and negative reactions to imperfection (Stoeber & Otto, 2006). These two higher-order dimensions have been studied extensively using various models and measures (Stoeber, 2018).

As well as manifesting as a general personality characteristic, perfectionism also manifests in multiple specific domains such as sport. Here, perfectionism can manifest more

in one domain of life than in other domains or life in general (e.g., McArdle, 2010).

Reflecting this feature of perfectionism, athletes have been found to report higher levels of

perfectionism in sport than in other domains of their life (Dunn, Gotwals, & Causgrove Dunn,

2005). Adopting sport specific models and measures also show greater explanatory utility for

sports outcomes than general measures (Dunn et al., 2005). Such domain-specific models

make it possible that perfectionism in sport may have different origins and consequences in

comparison to perfectionism in other domains (Appleton & Curran, 2016).

Perfectionistic strivings and perfectionistic concerns are associated with various positive

and negative outcomes in sport (see Hill et al., 2018, for a review). This research shows that

perfectionistic strivings are the most complex of the two dimensions. On the one hand,

perfectionistic strivings are associated with problem-focused coping, higher subjective well-

being, and higher athlete engagement (e.g., Gaudreau & Verner-Filion, 2012; Jowett, Hill,

Hall, & Curran, 2016; Madigan, Hill, Anstiss, Mallinson-Howard, & Kumar, 2018). On the

other hand, under conditions of failure, perfectionistic strivings predict decrements in

performance and negative cognitions and emotions towards the task and self (e.g., Anshel &

Mansouri, 2005; Curran & Hill, 2018; Hill et al., 2011). Perfectionistic concerns, by contrast,

show a more straightforward pattern of relationships. They are associated with numerous

debilitating outcomes which include (among others) avoidant coping, lower subjective well-

being, and higher athlete burnout (e.g., Gaudreau & Verner-Filion, 2012; Jowett et al., 2016;

Hill, Hall, & Appleton, 2010).

Development of General Perfectionism

Given the importance of perfectionism in sport, it is surprising that very little research

has examined its development (Appleton & Curran, 2016). Theories of the development of

perfectionism center on early childhood experiences and, in particular, parental socialization

(i.e., the role of parental behaviors in the development of children's behaviors). According to

Hewitt, Flett, and Mikail (2017), when child attachment needs for belonging and self-esteem are only intermittently met by parents, children may come to view others as critical and develop an insecure sense of self-worth. Subsequently, children develop relational dependencies involving feelings of unworthiness and shame. From this perspective, perfectionism is adopted to eschew the psychological pain of rejection and bolster conditional self-worth for achievement and to gain the approval of others.

A specific form of parental socialization purported to increase perfectionism is excessive achievement expectations. This pathway of perfectionism development follows a social expectations model whereby perfectionism develops in response to perceived or actual pressure from parents and approval that is conditional on attainment (Flett et al., 2002). The model thus posits that considerable pressures from parents have a significant role in the development of an individuals' general perfectionism. In this regard, perfectionism develops when individuals internalize and act to mitigate these pressures from their parents. Within this pathway, parental pressure is a key antecedent of both perfectionistic strivings and perfectionistic concerns.

The social expectations pathway has received some support from research. Notably, this includes a small number of longitudinal studies. Damian, Stoeber, Negru, and Baban (2013), for example, found that excessive parental expectations predicted increased general perfectionistic concerns in adolescents over a nine-month period. Similarly, Soenens et al. (2008) found that parental psychological control (the tendency to pressure children into meeting lofty goals by withdrawing love and expressing disappointment) predicted yearlong increases in adolescents' general perfectionistic concerns. These findings implicate parental pressure as an antecedent of, at least, the perfectionistic concerns dimension of individuals' general perfectionism.

Support for the social expectations pathway is also evident in sport. Numerous cross-

sectional studies have shown that parental expectations (or parental pressure) correlate

positively with athletes' sport-specific perfectionism (e.g., Gotwals, Dunn, Causgrove Dunn,

& Gamache, 2010). In addition, two studies (McArdle & Duda. 2004; Sapieja, Dunn, & Holt,

2011) found that high parental expectations positively correlated with perfectionistic strivings

and perfectionistic concerns in adolescent athletes. Similarly, Curran and colleagues (Curran,

2018; Curran, Hill, & Williams, 2017) reported that parental conditional regard positively

predicted both perfectionistic strivings and perfectionistic concerns in junior athletes.

Collectively, these studies provide support for the theoretical propositions of the social

expectations pathway as it pertains specifically to the influence of parents.

Development of Sport-Specific Perfectionism

Appleton and Curran (2016) recently extended the social expectations model of

perfectionism to include coach influences when considering the development of sport-specific

perfectionism. Just as excessive parental expectations are thought to contribute to athletes'

general perfectionism, coach expectations are likely to influence athletes' sport-specific

perfectionism. This is because coaches are an important social agent in athletes' relational

networks, and they are people with whom athletes will interact with on a regular basis

(Mageau & Vallerand, 2003). Like parental pressures, then, coach expectations may increase

perfectionistic strivings and perfectionistic concerns.

Several studies have provided support for the possibility that coaches may be especially

important in the development of sport-specific perfectionism. For example, psychologically

controlling coach behaviors, such as punishment and conditional regard, show positive

correlations with athletes' perfectionistic strivings and perfectionistic concerns (e.g., Appleton

Hall, & Hill, 2011; Barcza-Renner, Eklund, Morin, & Habeeb, 2016; Lemyre, Hall, &

Roberts, 2008). More direct evidence is also provided by studies that have found coach

pressure predicts higher perfectionistic strivings and perfectionistic concerns among

adolescent athletes (e.g., Sapieja et al., 2011). Notably, Gotwals et al. (2010) also found coach pressure to predict perfectionistic strivings and perfectionistic concerns in a sample of late-adolescent athletes.

Although current findings are suggestive of a link between coach pressure and athlete perfectionism, several issues remain unresolved. First, findings from previous cross-sectional studies examining the relations between coach pressure and perfectionism are mixed. For example, Madigan, Stoeber, and Passfield (2016) found that coach pressure predicted higher perfectionistic strivings and concerns whereas Chen, Chen, Kee, and Tsai (2008) found nonsignificant relationships. These relationships are therefore currently unclear at a cross-sectional level. To address this issue, we will utilize mini meta-analysis (Goh, Hall, & Rosenthal, 2016). This analysis provides more accurate estimations of effect sizes by combining effects from multiple samples. Although commonly used in personality and social psychology (see Goh et al., 2016), this will represent the first application of this analysis to sport psychology. Second, research to date has employed only cross-sectional designs, which cannot test for temporal precedence (Gollob & Reichardt, 1987). The lack of temporal precedence is at odds with the aim of testing developmental relationships between coach pressure and athlete perfectionism. Third, no test of the social expectations pathway has compared the influence of parents and coaches in the development of sport-specific perfectionism. It may be that only parents are important (formulation based on general perfectionism), only coaches are important (formulation based on domain-specific perfectionism), or that both parents and coaches are important (a combination of both).

The Present Study

Against this background, the present study had two aims. First, we aimed to re-examine the cross-sectional relationships between coach and parental pressure to be perfect and perfectionism in sport across three samples of junior athletes. Second, we aimed to examine

whether coach and parental pressure to be perfect would predict changes in perfectionism in sport over time. Guided by theory and research, we expected that—across the three samples— coach pressure and parental pressure to be perfect would positively predict perfectionistic strivings and perfectionistic concerns at both the cross-sectional and the longitudinal level.

Method

Participants

Sample 1. Participants from Sample 1 were 212 junior athletes (158 male, 54 female) recruited from sports academies. Participants' mean age was 17.2 years ($SD = 0.9$; range = 16-19 years). Participants were involved in different sports (111 in soccer, 36 in rugby, 28 in basketball, 17 in athletics, and 20 in other sports [e.g., cycling, tennis]) and trained on average 10.2 hours per week ($SD = 4.1$). In combination with the first time point data from Sample 2 and 3, and because of the similar demographic profiles, we used Sample 1 to ascertain the cross-sectional relationships between coach pressure, parental pressure, perfectionistic strivings, and perfectionistic concerns.

Sample 2. Participants from Sample 2 were 103 junior athletes (82 male, 21 female) from Madigan et al. (2015). Participants' mean age was 17.7 years ($SD = 0.8$; range = 16-19 years). Participants were involved in different sports (47 in soccer, 26 in rugby, 13 in basketball, 8 in athletics, and 9 in other sports [e.g., cycling, squash]) and trained on average 10.6 hours per week ($SD = 5.2$). We used Sample 2 to ascertain the extent to which coach pressure and parental pressure predict change in perfectionistic strivings and perfectionistic concerns over a relatively short period of three months.

Sample 3. Participants from Sample 3 were 141 junior athletes (124 male, 17 female) from Madigan et al. (2016). Participants' mean age was 17.3 years ($SD = 0.8$; range = 16-19 years). Participants were involved in a range of sports (60 in soccer, 36 in rugby, 18 in basketball, 14 in athletics, and 13 in other sports [e.g., cycling, squash]) and trained on

average 9.6 hours per week (*SD* = 5.6). We used Sample 3 to also ascertain the extent to

which coach pressure and parental pressure predict change in perfectionistic strivings and

perfectionistic concerns over time but, in this case, over a longer period of six months.

Procedure

The study was approved by the relevant university ethics committee. Informed consent

was obtained from all participants. In addition, parental consent was obtained from

participants below the age of 18 years. Measures were distributed during training in the

presence of the first author, or participants completed an online version of the questionnaire

(Sample 3). Participants from Sample 2 completed all measures twice separated by three

months: once in January 2014 (Time 1) and then again in April 2014 (Time 2). During this

period, all participants were in regular seasonal training and competition with the exception of

those involved in athletics who were in pre-seasonal training. We opted for a three-month

interval given evidence that this has shown to allow researchers to observe changes in

perfectionism over and above normal variability (e.g., Pleva & Wade, 2007). Participants

from Sample 3 were administered all measures at two time points separated by six months:

once in October 2014 (Time 1) and then again in April 2015 (Time 2). These time points were

chosen to enable us to monitor changes over (approximately) a season, capturing the start and

end of the season (for as many sports as possible).

Measures

We measured perfectionism, coach pressure, and parental pressure with the

Multidimensional Inventory of Perfectionism in Sport (MIPS; Stoeber, Otto, Pescheck,

Becker, & Stoll, 2007). The MIPS comprises four subscales: Striving for Perfection capturing

perfectionistic strivings (5-items; e.g., "I strive to be as perfect as possible"), Negative

Reactions to Imperfection capturing perfectionistic concerns (5-items; e.g., "I feel extremely

stressed if everything does not go perfectly"), Coach Pressure to be Perfect capturing

perceived pressure to be perfect coming from the coach (8-items; e.g., "My coach expects my

performance to be perfect"), and Parental Pressure to be Perfect capturing perceived pressure

to be perfect coming from the parents (8 items; e.g., "My parents expect my performance to

be perfect"). Parental pressure to be perfect reflects athletes' perceptions that their parents

expect them to be perfect and criticize them if they fail to achieve. Coach pressure to be

perfect is the same as parental pressure, except that it is the coach who is perceived as

expecting perfection and being critical. Participants responded to items using a scale from 1

(*strongly disagree*) to 5 (*strongly agree*). Evidence suggests that scores on the MIPS are

reliable and valid (e.g., Madigan, 2016; Stoeber et al., 2009; see also Dunn et al., 2016;

Madigan et al., 2016; Stoll, Lau, & Stoeber, 2008; Zarghmi, Ghamary, Shabani, & Varzaneh,

2010). Moreover, evidence implies that Striving for Perfection and Negative Reactions to

Imperfection scores are reliable and valid indicators of perfectionistic strivings and

perfectionistic concerns (e.g., Gotwals, Stoeber, Dunn, & Stoll, 2012; Stoeber & Madigan,

2016).

Analytic Strategy

To ascertain the strength and direction of the cross-sectional associations between

pressure and perfectionism, a mini meta-analysis was performed using Time 1 data from all

three samples (Goh et al., 2016). To do so, we followed Goh et al.'s recommendations and

used fixed-effects models in the R metaphor package (Viechtbauer, 2010). This analysis

computes the inverse variance weighted mean correlation coefficients across our samples. We

also calculated Cochran's Q and I^2 values to quantify the degree of between study

heterogeneity in correlation coefficients. The former is a chi-square statistic that quantifies the

total variance in the meta-analysis whereas the latter is the percentage of variance in the meta-

analysis that is explained by between study differences (Richardson, Abraham & Bond,

2012). A statistically significant Q is understood to reflect substantial heterogeneity in effect

sizes and I^2 proportions of 25%, 50% and 75% represent low, moderate, and high

heterogeneity, respectively (Higgins, Thompson, Deeks & Altman, 2003).

Next, a two-step multiple regression analysis was employed to examine the effect of

coach pressure and parental pressure on changes in athletes' perfectionistic strivings and

concerns using Samples 2 and 3. In Step 1, athlete's perfectionistic strivings and concerns at

Time 2 were regressed on their perfectionistic strivings and concerns at Time 1. This

autocorrelation yeilds a residual for athletes Time 2 perfectionistc strivings and concerns that

captures change variance across the time points. In Step 2, the Time 1 coach pressure and

parent pressure variables were added to the regression model in Step 1 to ascertain whether

these variables explain significant portions of variance in the residuals of perfectionistc

strivings and concerns at Time 2. Delta F-test was used to compare the goodness of fit of the

nested models, and standardised beta coeffcients were inspected to ascertain whether coach

pressure and parent pressure are significant predictors of change in perfectionistic strivings

and concerns. Multiple regreession analyses were conducted in R (R Core Team, 2014).

Results

Preliminary Analyses

We first inspected data for missing values. Given that only few item responses were

missing ($< 5\%$), missing responses were replaced with the mean of the item responses of the

corresponding scale (ipsatized item replacement; Graham, Cumsille, & Elek-Fisk, 2003).

Next, we computed Cronbach's alphas for all variables (see Tables 1-3) which were all

satisfactory ($> .70$; Nunnally, 1970). Then, we screened each sample for multivariate outliers

(Tabachnick & Fiddell, 2007). In all samples, no participant showed a Mahalanobis distance

larger than the critical value at the $p < .001$ level. Two participants from Sample 2 did not

complete the measures on both occasions and were excluded from the longitudinal analyses,

resulting in a final sample size of $N = 101$ for Sample 2. Finally, 31 participants from Sample

3 did not complete measures on both occasions, resulting in a final sample size of $N = 110$ for Sample 3. (Descriptive statistics and bivariate correlations are presented in Tables 1-3.)

Mini Meta-Analysis

Results of the mini meta-analysis of the correlations between perfectionism dimensions and pressure dimensions are presented in Table 4. All inverse variance weighted mean correlation coefficients were positive, significant, and small-to-medium sized, lending initial support to the idea that both parents and coaches are important in the development of athletes' perfectionism. The between-sample correlation coefficient variance was relatively small (i.e., $Q < 5$), however, this is likely due to the small number of studies in the meta-analysis (Higgins et al., 2003). More informative is the proportion of this this variance that was not due to chance, and an inspection of the I^2 values indicates that this was quite large (where I^2 could be calculated, it ranged from 40-56%). This alludes to substantial variability in correlation coefficients that should be considered when interpreting the size of the inverse variance weighted mean correlation coefficients.

Multiple Regression Analyses

Results of the multiple regression analyses testing longitudinal associations in Sample 2 are presented in Table 5. In Step 1 of these analyses, the regression models for the autocorrelation of perfectionistic strivings (F [1, 99] = 87.31, $p < .01$; $R^2 = .47$; R^2adj = .46) and perfectionistic concerns (F [1, 99] = 111.2, $p < .01$; $R^2 = .53$; R^2adj = .52) were significant. In Step 2, the addition of coach and parental pressure to be perfect at Time 1 explained additional variance beyond the autocorrelation of perfectionistic strivings (F-change [2, 97] = 3.09, $p < .05$) but not perfectionistic concerns (F-change [2, 97] = 2.11, $p > .05$) at Time 2. Inspection of beta coefficients revealed that coach pressure to be perfect predicted increases in perfectionistic strivings and perfectionistic concerns from Time 1 to Time 2. This was not the case for parental pressure.

Results of the multiple regression analyses testing longitudinal associations in Sample 3 are presented in Table 6. In Step 1 of these analyses, the regression models for the autocorrelation of perfectionistic strivings (F [1, 108] = 51.79, $p < .01$; $R^2 = .32$; R^2adj = .32) and perfectionistic concerns (F [1, 108] = 56.41, $p < .01$; $R^2 = .34$; R^2adj = .34) were significant. In Step 2, the addition of coach and parental pressure to be perfect (at Time 1) explained additional variance beyond the autocorrelation of perfectionistic strivings (F-change [2,106] = 3.71, $p < .05$) and perfectionistic concerns (F-change [2,106] = 6.84, $p > .01$) at Time 2. Inspection of beta coefficients revealed that coach pressure to be perfect predicted increases in perfectionistic strivings and perfectionistic concerns from Time 1 to Time 2. This was not the case for parental pressure.[1]

Discussion

We examined the extent to which pressure to be perfect from parents and coaches showed cross-sectional and longitudinal relationships with perfectionism across three samples of junior athletes. We hypothesized that coach pressure and parental pressure to be perfect would positively predict perfectionistic strivings and perfectionistic concerns at both the cross-sectional and the longitudinal level. Findings provided partial support for our hypotheses. In mini meta-analyses of the combined cross-sectional data ($N = 423$), both parental pressure and coach pressure positively correlated with perfectionistic strivings and perfectionistic concerns. In our longitudinal analyses, however, only coach pressure predicted

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[1]We also ran models that included gender as a covariate. Gender emerged as a nonsignificant predictor and no changes in model interpretation were evident. In addition, we ran models testing reciprocal effects (i.e., the two perfectionism dimensions predicting changes in coach and parental pressure), but both perfectionistic strivings and concerns emerged as nonsignificant predictors.

increases in perfectionistic strivings and perfectionistic concerns.

Cross-Sectional Relationships between Pressure and Sport-Specific Perfectionism

Because findings from previous cross-sectional studies examining the relationships between pressure and perfectionism are mixed, in the present study, we used mini meta-analyses of the combined cross-sectional data to re-examine these relationships. This represents the first application of these analyses to sport psychology. The findings suggest that coach and parental pressure are both positively correlated with perfectionistic strivings and perfectionistic concerns. The findings therefore lend credence to the proposition that when examined via a cross-sectional snapshot both coaches and parents are relevant to the development of perfectionism in junior athletes. They also highlight the utility of the mini meta-analytic approach in this context. For this reason, we suggest that future studies in sport psychology may benefit from adopting this approach.

Coach Pressure and Sport-Specific Perfectionism

This is the first study to examine the relationship between coach pressure and sport-specific perfectionism over time. Prior to the current study, this relationship was examined only in cross-sectional studies. Our findings support and extend previous research by showing that coach pressure predicts increases in both perfectionistic strivings and perfectionistic concerns. As such, we can confirm that the social expectations pathway typically associated with parents and the development of general perfectionism most likely also extends to coaches and sport-specific perfectionism. That is, athletes may develop perfectionism in response to perceived or actual pressures from coaches and in an attempt to mitigate those pressures. Coach pressure therefore warrants consideration by researchers and practitioners when seeking to understand how an athletes' sport-specific perfectionism may develop.

As to why the expectations of coaches are likely so important, several possibilities are noteworthy. Coaches spend a considerable amount of time with young athletes. Therefore, the

frequency and duration of sport-related interactions may be important in conveying

expectations in sport. Coaches are also likely to be viewed as legitimate sources of

information and gatekeepers for athletes. Therefore, the interactions and information

conveyed by coaches will hold significance for junior athletes. These factors partly explain

why coaches have been found to be influential in shaping athlete motivation (e.g., Jõesaar,

Hein & Hagger, 2012), perceptions of competence (e.g., Strachan, Côté, & Deakin, 2009),

and emotions (e.g., Bartholomew, Ntoumanis, Ryan, & Thogersen-Ntøumani, 2011). In the

same way, our research suggests that coaches may be influential in personality development

and sport-specific characteristics (i.e., perfectionism) among junior athletes.

Parental Pressure and Sport-Specific Perfectionism

There is a longstanding association between parental behavior and the development of

perfectionism. However, unlike coach pressure, parental pressure did not predict changes in

sport-specific perfectionism in the current study. The implication here is that parental pressure

may not be as important as coach pressure. This may be because parents are (typically) less

involved with their child's sporting activities than with their child's life in general. As such,

junior athletes may experience fewer expectations from parents related to sport or be less

perceptive to them in this domain in comparison to other social actors or domains (Wuerth,

Lee, & Alfermann, 2004). It is also possible that while adolescence has been shown to be a

key period in the development of perfectionism (cf. Stoeber, Edbrooke-Childs, & Damian,

2018), perceptions of parental pressure or the importance of parental pressure (versus coach

pressure) diminishes as children get older.

This is not to say that parents are unimportant. Aside from social expectations, Flett et

al's (2002) model proposes several other pathways through which parents can influence their

child's perfectionism. These other pathways are not tested in the current study. For example,

one other relevant pathway is based on social learning, whereby athletes model the behaviors

of their parents in sport. In addition, the development of general perfectionism (instilled by parents) is also likely to contribute to more domain-specific perfectionism including in sport for junior athletes. Accordingly, there remain other theoretical mechanisms via which parents may still have an effect on their child's sport-specific perfectionism. Future studies are required to examine these other pathways.

General and Sport-Specific Perfectionism

The present findings have important implications for our understanding of the development of perfectionism. They imply that the antecedents of perfectionism in sport may be different from general perfectionism. Appleton and Curran's (2016) addition of coaches to Flett et al.'s (2002) model provided the first formulization of this idea. With the present study, we provide the first evidence supporting this proposition by showing that coach pressure temporally precedes changes in sport-specific perfectionism, and does so over and above parental pressure. We think that the present findings provide an important empirical extension that could be incorporated into further theorizing on the development of perfectionism in sport. Specifically, theory needs to account for a potential hierarchy of influencers. In this regard, it needs to show that coaches are not only important but could actually be *more* important than parents in sport. This also has broader theoretical implications. It suggests that domain-specific factors are more strongly related to the development of domain-specific perfectionism than general factors. As such, we call for future research both inside and outside of sport to test these propositions.

Limitations and Future Research

The present study has a number of limitations. First, the findings may be limited to the specific model and measures of perfectionism and perceived pressure we used. Future studies may wish to consider including other measures of perfectionism from different models of perfectionism in sport (e.g., performance perfectionism in sport; Hill, Appleton, & Mallinson,

2016) to explore whether it makes a difference how the two higher-order dimensions of perfectionism are measured. Second, further work is necessary with regard to the psychometric properties of the MIPS. This includes tests of gender and temporal invariance. Future studies may also wish to utilize latent variables to account for measurement error. Third, we adopted time lags between waves of three and six months. Future research seeking to explore the dynamics of these relationships should adopt smaller (e.g., one week) and longer time periods (e.g., one year). We also note that because we only had two waves of data, we were not able to examine nonlinear relationships (e.g., quadratic relationships). As such, the findings provide only preliminary evidence for linear relationships between coach pressure and changes in perfectionism over time. Future studies should adopt more waves in order to examine nonlinearity. Fourth, the sample was predominantly male. Consequently, future studies need to replicate the findings with athlete samples that have a greater proportion of female athletes. Finally, future research should explore other factors that may play a role in the development of perfectionism in sport. For example, it would be interesting to determine the influence of success. It is plausible that an athlete who continuously experiences competitive success may set even higher goals, and as a consequence may increase their personal standards for performance, as has been found for academic success and perfectionistic strivings in school students (Damian, Stoeber, Negru-Subtirica, & Băban, 2017).

Conclusion

The present study is the first to show that coach pressure to be perfect may be an antecedent of the development of junior athletes' perfectionism. In doing so, the study also provided evidence that coach pressure to be perfect may be more important than parental pressure to be perfect. With this in mind, our findings imply that sport-specific perfectionism may have different developmental antecedents than general perfectionism.

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Table 1. Bivariate Correlations, Descriptive Statistics, and Cronbach's Alphas for Sample 1.

Variable	1	2	3	4
1. Perfectionistic strivings				
2. Perfectionistic concerns	.53***			
3. Coach pressure to be perfect	.17*	.24***		
4. Parental pressure to be perfect	.09	.17*	.49***	
M	3.26	3.09	2.76	2.46
SD	0.79	0.75	0.87	0.98
Cronbach's alpha	.74	.71	.90	.92

Notes. $N = 212$.

*$p < .05$. ***$p < .001$.

Table 2. Bivariate Correlations, Descriptive Statistics, and Cronbach's Alphas for Sample 2.

Variable	1	2	3	4	5	6	7	8
Time 1								
1. Perfectionistic strivings								
2. Perfectionistic concerns	.52***							
3. Coach pressure to be perfect	.25*	.39***						
4. Parental pressure to be perfect	.23*	.33***	.57***					
Time 2 (3 months later)								
5. Perfectionistic strivings	.69***	.36***	.33**	.19				
6. Perfectionistic concerns	.48***	.73***	.40***	.27**	.65***			
7. Coach pressure to be perfect	.15	.20*	.71***	.44***	.44***	.41***		
8. Parental pressure to be perfect	.06	.09	.44***	.74***	.27**	.24*	.61***	
M	3.21	2.97	2.67	2.32	3.24	3.04	2.76	2.50
SD	0.82	0.75	0.85	1.07	0.76	0.77	0.85	1.04
Cronbach's alpha	.83	.74	.92	.95	.80	.76	.89	.95

Note. $N = 101$.

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3. Bivariate Correlations, Descriptive Statistics, and Cronbach's Alphas for Sample 3.

Variable	1	2	3	4	5	6	7	8
Time 1								
1. Perfectionistic strivings								
2. Perfectionistic concerns	.52***							
3. Coach pressure to be perfect	.31***	.13						
4. Parental pressure to be perfect	.32***	.33***	.31***					
Time 2 (6 months later)								
5. Perfectionistic strivings	.58***	.49***	.41***	.23**				
6. Perfectionistic concerns	.39***	.61***	.35***	.24**	.64***			
7. Coach pressure to be perfect	.34***	.20*	.76***	.37***	.34***	.27**		
8. Parental pressure to be perfect	.27**	.25**	.39***	.48***	.23***	.15	.38***	
M	3.21	2.89	2.54	2.19	3.24	3.04	2.54	2.12
SD	0.79	0.82	0.76	0.94	0.71	0.69	0.84	0.88
Cronbach's alpha	.79	.78	.89	.94	.72	.74	.91	.96

Note. $N = 110$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Results of the Mini Meta-Analysis.

Coefficients	Perfectionistic Strivings		Perfectionistic Concerns	
	Coach Pressure	Parent Pressure	Coach Pressure	Parent Pressure
Study 1 r ($N = 212$)	.17	.09	.24	.17
Study 2 r ($N = 101$)	.25	.23	.39	.33
Study 3 r ($N = 110$)	.31	.32	.13	.33
r^+	.23**	.19**	.26**	.26**
SE	.05	.05	.05	.04
Z	4.97	4.11	5.69	6.03
95% CI LL	.10	.10	.17	.18
95% CI UL	.57	.28	.35	.35
Q (df)	1.70 (2)	4.61 (2)	4.35 (2)	3.03 (2)
I^2	0	56.60	54.00	39.45

Note. N = sample size; r^+ = inverse variance weighted mean correlation; SE = standard error of the inverse variance weighted mean correlation; Z = standard normal deviate of the inverse variance weighted mean correlation; 95% CI LL = lower limit of the 95% confidence interval for the inverse variance weighted mean correlation; 95% CI UP = upper limit of the 95% confidence interval for the inverse variance weighted mean correlation; Q = Cochran's Q; I^2 = percentage of total variation across studies due to "true" heterogeneity rather than sampling error (Higgins & Thompson, 2002).
** $p < .01$.

Table 5. Summary of Regression Analyses Predicting Perfectionism at Time 2 (3 Months Later) for Sample 2.

Predictors	Perfectionistic strivings Time 2		Perfectionistic concerns Time 2	
	ΔR^2	β	ΔR^2	β
Step 1				
DV at Time 1		.68***		.73***
Step 2	.03*		.02	
DV at Time 1		.65***		.68***
Coach pressure to be perfect Time 1		.21*		.17*
Parental pressure to be perfect Time 1		−.07		−.05

Note. $N = 101$. ΔR^2 = difference in R^2 from step 1 to step 2; β = standardized regression coefficient. DV = dependent variable.

*$p < .05$. ***$p < .001$.

Table 6. Summary of Regression Analyses Predicting Perfectionism at Time 2 (6 Months Later) for Sample 3.

Predictors	Perfectionistic strivings Time 2		Perfectionistic concerns Time 2	
	ΔR^2	β	ΔR^2	β
Step 1				
DV at Time 1		.57***		.59***
Step 2	.04*		.08**	
DV at Time 1		.52***		.60***
Coach pressure to be perfect Time 1		.22**		.28***
Parental pressure to be perfect Time 1		−.02		−.05

Note. $N = 110$. ΔR^2 = difference in R^2 from step 1 to step 2; β = standardized regression coefficient. DV = dependent variable.

*$p < .05$. **$p < .01$. ***$p < .001$.