Predictors and Outcomes of Sports Coaches' Athlete-Invested Contingent Self-worth

Sofie Morbée[1], Leen Haerens[2], Bart Soenens[1], Tom Loeys[3], Tom De Clerck[2], Joachim Waterschoot[1], and Maarten Vansteenkiste[1]

[1] Department of Developmental, Personality and Social Psychology, Ghent University, Belgium

[2] Department of Movement and Sports Sciences, Ghent University, Belgium

[3] Department of Data-analysis, Ghent University, Belgium

Declarations

This work was supported by Research Foundation Flanders (FWO) [Grant number 3F023819].

The authors have no relevant financial or non-financial interests to disclose.

All de-identified data and analysis code are available at Zenodo: https://doi.org/10.5281/zenodo.7477479.

Correspondence concerning this article should be addressed to Sofie Morbée, Department of developmental, personality and social psychology, Ghent University, Henri Dunantlaan 2, 9000 Ghent, Belgium. Email: Sofie.Morbee@UGent.be.

Abstract

Some sports coaches not only invest considerable time and energy in their athletes, but also attach their self-worth to the successes and failures of their athletes. Grounded in Self-Determination Theory, the present study aimed to examine the theoretical predictors and outcomes of such Athlete-Invested Contingent Self-worth (AICS). Results from a cross-sectional study (Study 1; N = 740, M_{age} = 34.37 years) and an experimental vignette-based study among youth sports coaches (Study 2; N = 318, M_{age} = 38.94 years) indicated that AICS was positively related to a controlling coaching style and negatively related to a structuring style. Study 1 showed that a perceived evaluative club board was positively related to AICS, and Study 2 further demonstrated that poor performance was negatively associated with AICS and that an evaluative climate was related to AICS through experiences of need frustration. The discussion focuses on the pitfalls of coaches' contingent self-worth for the development of their athletes.

Keywords: Multi-Study Approach, Self-Determination Theory, Coaching Style, Vignette Design, Evaluative Climate, Athlete Performance

The extent to which youth athletes are motivated and feel good in the sports club depends, among other things, on how their coach interacts with them (e.g., Rocchi et al., 2020). Although a large body of research, much of it based on Self-Determination Theory (SDT; Ryan & Deci, 2017), has examined the effects of different coaching styles on athlete outcomes, relatively little is known about what drives coaches to adopt a motivating or more demotivating coaching style (see Matosic et al., 2016 for a review). This is unfortunate, as it is critical to gain insight into the processes underlying coaches' (de)motivating styles in order to develop effective intervention programs to the benefit of the motivation and well-being of youth athletes.

Previous research among sports coaches already showed that coaches who are more narcissistic (Matosic et al., 2017), who display more controlled motivation (Rocchi & Pelletier, 2017), or who are obsessively passionate about their sport (Kim et al., 2019) are at higher risk of adopting a more demotivating coaching style. However, building on research in other life domains, this study examines a novel possible determinant of coaching style, that is, coaches' *athlete-invested contingent self-worth* (AICS). Contingent self-worth refers to the tendency to tie one's self-worth to external standards (e.g., performance outcomes, evaluations), such that meeting or failing to meet these standards affects one's self-worth (Crocker, 2002; Kernis, 2006). Dozens of studies have examined the correlates of contingent self-worth, showing that it is associated with more controlled forms of motivation (Van der Kaap-Deeder et al., 2016) as well as negative affect (e.g. increased stress, anxiety) in response to threat (Zeigler-Hill et al., 2011). While most of these previous studies have focused on the extent to which individuals make their self-worth dependent on their *own* accomplishments, individuals can also make their self-worth dependent on the performance of *others* (e.g., Ng et al., 2014). This phenomenon is referred to as other-invested contingent self-worth. In the case of sports coaches, AICS refers to the tendency of coaches to make their self-worth contingent on the performance of their athletes. To gain more insight into coaches' AICS, the present study aims to examine (1) coaches' controlling and structuring coaching

styles as potential outcomes of AICS, and (2) different types of pressure (from athletes' parents, the club board, and poor athlete performance) as predictors of AICS. In addition, it examines the role of AICS as an explanatory (i.e., mediating) mechanism in the relation between its putative predictors and outcomes. To this end, it relies on a cross-sectional survey and a vignette-based design.

Outcomes of Athlete-Invested Contingent Self-Worth

When coaches score high on AICS, their self-esteem is tied to the performance of their athletes. Coaches then experience themselves as more worthwhile when their athletes perform well, and experience diminished self-worth and even a sense of failure when their athletes perform poorly. Individuals are more likely to invest their self-worth in others when they over-identify with others and perceive them as an extension of themselves (Smoll et al., 2011). When sports coaches over-identify with their athletes, their athletes' poor performance becomes a potential threat to the coaches' self-worth. Competition is then no longer just about the process development, enjoyment, and performance of the athletes; the excellence and flawless performance of the athletes becomes critical to the maintenance of the coach's self-worth (Smoll et al., 2011). Because their self-worth is tied to athlete outcomes, it is plausible to assume that coaches with elevated AICS are at risk for adopting a more controlling style, which involves the use of pressure to force athletes to act, think, or feel in specific, prescribed ways through domineering and demanding practices (e.g., guilt-induction, intimidation, punishment; Delrue et al., 2019).

A controlling coaching style imposes various costs on athletes, including feelings of pressure (Haerens et al., 2015), ill-being (Haerens et al., 2018), reduced sports enjoyment (De Muynck et al., 2017), and a higher drop-out rate (Pelletier et al., 2001). Previous research in the parenting context has provided preliminary evidence for the hypothesis that other-invested contingent self-worth is associated with controlling socialization, a finding that has been observed both concurrently and over time (Wuyts, Vansteenkiste, et al., 2015), and using either child or parent reports of controlling parenting (e.g.,

Steffgen et al., 2022; Wuyts, Chen, et al., 2015). In the medical context, patient-invested contingent self-worth in nurses has also been found to be associated with a more controlling approach to patients (Duprez et al., 2019).

Although previous research in relationships other than the coach-athlete relationship suggests a positive association between AICS and controlling coaching, it is less clear whether and how AICS relates to the provision of structure, another central dimension of coaches' interaction style (Delrue et al., 2019; Mageau & Vallerand, 2003). Coaches enhance athletes' sense of competence through structure, which includes communicating clear expectations and goals, providing help and support to achieve these goals, and providing constructive (process-oriented) feedback (e.g., Curran et al., 2013). A structuring style is associated with adaptive athlete outcomes such as high-quality motivation and engagement (Reynders et al., 2019). With regard to the associations between AICS and structure, one possibility is that coaches who score high on AICS have a highly structuring approach. In the circumplex model of (de)motivating coaching (Delrue et al., 2019), controlling and structuring styles are juxtaposed because they are both more directive in nature, with the coach taking the lead in the interaction. AICS may be associated with a generally more directive approach, manifested by both a more maladaptive controlling response and a more adaptive structuring response. That is, coaches may seek to protect their self-worth not only by being controlling, but also by providing structure. Alternatively, AICS may be negatively related to providing structure. Providing structure in a truly competence-supportive manner requires coaches to be flexible, constructive, and attuned to athletes' abilities and progress. Coaches must formulate achievable goals and expectations, break the path to goal attainment into small steps, and provide tailored assistance and process-oriented feedback (Aelterman et al., 2017). Coaches high on AICS may not be able to provide an athlete-centered structure because these coaches are too preoccupied with their own self-worth concerns and lack the psychological flexibility to see the athlete's perspective. In an attempt to achieve quick success, they may set unrealistic goals, provide unwanted

and premature help, and provide person-centered feedback that is highly contingent on the athlete's performance (i.e., praising the athlete's talent in the case of success and criticizing the athlete's lack of skill in the case of failure). Thus, there is reason to believe that coaches high in AICS provide less rather than more structure.

Predictors of Athlete-Invested Contingent Self-worth

In addition to examining the coaching style correlates of AICS, the present study also seeks to shed light on its predictors among youth sports coaches. In doing so, we focus on two broad categories of pressure-inducing predictors identified in the literature, namely contextual factors and perceptions of athlete performance (Matosic et al., 2016).

In Belgium, where the study took place, youth coaches are typically engaged as volunteers in sports clubs with multiple stakeholders. In the current study, we focus on the role of two key stakeholders who typically have the most direct contact with youth coaches, namely club board members and parents of youth athletes. More specifically, we are interested in the situation where these stakeholders create an evaluative, performance-oriented climate. In such a climate, coaches' competencies are evaluated and judged, with athletes' performance being a primary indicator of evaluation (Cunningham & Dixon, 2003). Such a climate may be related to coaches' contingent self-worth, as coaches may feel that they need to meet high standards in order to be perceived as valuable and competent, and to protect their reputation within the sports club. There is some limited evidence for this reasoning from previous work in the parenting context. Specifically, parents who reported greater exposure to contextual pressures (e.g., from the school directory, other parents) were found to report higher child-invested contingent self-worth (Wuyts, Vansteenkiste, et al., 2015).

In addition to contextual pressures, another pressure-generating feature specific to the sports context is the coach' perception of the athlete's performance. A central goal for many sports coaches is to support their athletes' development, which ultimately leads to high performance (Gould et al., 2002).

Because coaches invest heavily in the development of their athletes' skills and because athletes' performance levels are easily inferred, sports coaches may be more susceptible to measuring their abilities and self-worth as coaches through their athletes' performance. As a result, poor performance (e.g., a loss) may be associated with a temporary blow to coaches' self-worth. Indirect evidence for this link has been documented in longitudinal (e.g., Pomerantz & Eaton, 2001) and experimental (Wuyts et al., 2017) research in the parenting domain. When children did not perform well in school (e.g., Wang et al., 2012) or performed poorly on an experimental task (e.g., Wuyts et al., 2017), parents were more likely to adopt a controlling style. Presumably, the threat to parents' self-worth from their child's poor performance may elicit a controlling response to protect their self-worth. In other words, other-invested contingent self-worth may serve as an explanatory mechanism in the relation between children's poor performance and adults' interaction style (Wuyts, Vansteenkiste, et al., 2015). The question is whether these findings generalize to the sports context. Because wins and losses are part of the sports experience, it is possible that neither good nor poor athlete performance triggers coaches' AICS. Alternatively, good athlete performance may reinforce coaches' association of self-worth with their athletes' performance, possibly as an effort to validate or increase their overall self-worth.

The Present Study

The overall goal of the present study was to examine the theoretical outcomes and predictors of an orientation typical of many youth coaches, that is, the tendency to invest one's own self-worth in the performance of one's athletes. This objective was addressed in two studies. Study 1 was a cross-sectional survey study involving a group of sports coaches who coached at different levels of competition and in both individual and team sports. Study 2 used a vignette-based method in a sample of soccer coaches coaching at different levels of competition. In these two studies, we examined an integrated model with both the outcomes (i.e., controlling and structuring coaching; Aim 1) and predictors (i.e., pressure from the club board, athletes' parents, and poor athlete performance; Aim 2)

of AICS. In addition, we tested whether AICS might play an exploratory (i.e., mediating) role in the relation between its hypothesized predictors and outcomes by examining indirect effects (Aim 3).

Study 1

A preliminary aim of this initial cross-sectional study was to examine the reliability and construct validity of the AICS scale. We sought to provide evidence of construct validity by relating AICS to coaches' overall self-worth and the type of goals (i.e., intrinsic or extrinsic) they promote for their athletes. We hypothesized that AICS would be inversely related to overall self-worth, with coaches who felt more worthwhile as a person being less likely to link their self-worth to their athletes' performance. Furthermore, AICS would be positively related to promoting extrinsic goals, such as fame, and negatively related to intrinsic goals, such as promoting self-development and team cohesion (Soenens et al., 2015).

Concerning the key aims, we hypothesized that AICS would be positively related to controlling coaching. Whether coaches' AICS would relate to more or less structure is an open question (Research Question 1). In terms of predictors, we hypothesized that coaches' perceived evaluative climate, as expressed by board members and athletes' parents, would be uniquely positively related to AICS (Research Question 2). Finally, we hypothesized that AICS would serve as a mediator in the relation between its predictors and outcomes (Research Question 3).

Method

Procedure and Participants

Participants (64.9% of team sports) were recruited through a project called "Coach with the M-factor". This government-funded professionalization project supports youth coaches to become more skilled in motivating their athletes by offering three practical workshops (Reynders et al., 2019). Coaches participating in this project completed an online questionnaire prior to the start of the workshop course and after providing online informed consent. A sample of 740 youth coaches participated (M_{age} = 34.37 years; 75.4% male). The majority (50.5%) coached athletes younger than 12 years, 40.7% coached

athletes between 12 and 18 years, and 8.8% coached athletes between 18 and 21 years old. They had a mean of 7.43 years of coaching experience (*SD* = 8.61, range = 0-45 years) and spent 4.54 (*SD* = 3.99) hours per week on coaching. They coached teams competing at different levels: 22.5% coached at a recreational level, 26% at a low competitive level, and 51.5% at a (high) competitive level. The study was approved by the ethics committee of [UNIVERSITY BLINDED].

Measures

Athlete-Invested Contingent Self-Worth. Coaches' AICS was measured using a sport-specific version of the Child-Invested Contingent Self-Worth Scale (CICSES; Wuyts, Chen, et al., 2015; Wuyts, Vansteenkiste, et al., 2015). The scale consists of 18 items that assess the extent to which coaches' self-worth is contingent on their athletes' performance in general (6 inverted items; e.g., "Whether my athletes win or lose, my self-worth as a coach remains unaffected.") as well as on athletes' successes (6 items; e.g., "Only when my athletes win the game, I can feel proud of myself as a coach.") and failures (6 items; e.g., "When my athletes lose the game, I feel ashamed of myself as a coach.") in particular. Coaches rated items on a 7-point Likert scale, ranging from 1 (*does not describe me at all*) to 7 (*describes me extremely well*). Evidence for the reliability and validity of the scale is reported in the Preliminary Results section.

Intrinsic and Extrinsic Goal Promotion. The Aspiration Index (Kasser & Ryan, 1996), which assesses an individual's overall life aspirations, was adapted to assess whether coaches promoted intrinsic and extrinsic goals for their athletes (Jang, 2019). Coaches rated the extent to which they found it important for their athletes to pursue intrinsic aspirations (i.e., growth, enjoyment, community contribution, affiliation, and health) and extrinsic aspirations (i.e., excelling, financial success, fame, and physical attractiveness) on a 7-point Likert scale ranging from 1 (*does not describe me at all*) to 7 (*describes me extremely well*). Reliability of the intrinsic (15 items; "It is important to me that my athletes can develop to their full potential as athletes"; $\alpha = .90$) and extrinsic (12 items; "It is important

to me that my athletes will make a lot of money later"; α = .90) goal promotion scales was good.

Global Self-worth. To capture coaches' global perceptions of self-worth, we used the 10-item Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1979) (e.g., "On the whole, I am satisfied with myself"; α = 87). Coaches rated items on a 7-point Likert scale, ranging from 1 (*does not describe me at all*) to 7 (*describes me extremely well*).

Contextual Pressure. We considered both the club board and the athletes' parents as two sources of contextual pressure that contribute to an evaluative climate. Coaches' perceived pressure from the club board was assessed using a sport-specific adaptation of the Constraints at Work Scale (Pelletier et al., 2002), which has been successfully used in the sports context (Morbée et al., 2020). Four items (e.g., "The club board holds me responsible for the performance of my athletes"; α = .75) were rated on a 7-point scale ranging from 1 (*totally disagree*) to 7 (*fully agree*). Regarding parental pressure, in the absence of an existing validated scale, we developed 4 items ourselves (e.g., "I often feel pressured by parents for their children to perform well"). These four new items had good reliability (α = .81) and internal validity (model fit confirmatory factor analysis: $\chi^2(2) = 8.59$, $p < .05$; CFI = .98; SRMR = .02, RMSEA = .08).

Controlling and Structuring Coaching Behaviors*.* We used the Situation in Sports Questionnaire (SIS-Q; Delrue et al., 2019), a situation-based instrument that provides a fine-grained insight into coaches' motivating and demotivating coaching styles, with the identified styles being ordered along a circumplex structure. Although coaches completed the full questionnaire, the results reported here are limited to coaches' reliance on a controlling (15 items, α = .86) and a structuring (15 items, α = .86) coaching style. For example, the situation "You notice that an athlete is not satisfied that (s)he was not included in the competition selection. How do you react to this?" was followed by response options related to a controlling (e.g., You say "You have to learn to accept this. This is my decision") or structuring (e.g., You identify the steps needed for future selection) style. Coaches were

asked to rate items on a 7-point Likert scale, ranging from 1 (*does not describe me at all*) to 7 (*describes me extremely well*).

Plan of Analysis

All statistical analyses were performed using RStudio version 2022.02.3 (RStudio, 2022). First, we assessed the internal validity of the AICS scale by performing both an exploratory factor analysis (EFA; principal component analysis with varimax rotation) and a confirmatory factor analysis (CFA). We then examined the reliability by calculating Cronbach's alpha. We tested the construct validity of AICS by examining its associations with key validation variables in its nomological network (i.e., intrinsic and extrinsic goal promotion, and global self-worth) by calculating Pearson correlation coefficients. Finally, prior to examining the main aims, we conducted Pearson correlations among the key constructs in the integrated model to gain an initial understanding of how all of the study variables were correlated with each other.

Next, a structural equation model (SEM) with latent variables was tested to examine the integrated model. We used parcels for constructs with eight or more items for which we did not expect an underlying multidimensional structure, as we were interested in the relations between constructs rather than individual items. In addition, parceling data proved advantageous because it improves the model fit by increasing parsimony, reducing the possibility of correlated residuals or dual loading, and minimizing sampling error (Little et al., 2002). Specifically, the item-to-construct balance technique was used whereby parcels were created by combining higher-loading items with lower-loading items from the same scale, and these aggregates (i.e., parcels) were used as indicators of the latent variables (Little et al., 2002). This resulted in five 2-item parcels for global self-worth and five 3-item parcels for a controlling and structuring coaching style. Controlling and structuring coaching styles were modeled as outcomes of AICS, with AICS being predicted by a perceived evaluative climate provided by the club board and athletes' parents. Coaches' age and gender were included as covariates in the prediction of all

endogenous variables (i.e., trait AICS and a controlling and structuring coaching style). To test the robustness of the model, we examined whether the associations of the integrated model persisted after adding global self-worth as a covariate in the prediction of all endogenous variables.

Several indices were used to assess model fit, namely the χ^2 test, the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). Acceptable fit was indicated by CFI values of .90 or greater, and SRMR and RMSEA values of .08 or less (Hu & Bentler, 1999). To assess effect sizes, we follow the recommendations of Ferguson (2009), who states that for R^2 in the social sciences, .04 represents a small, .25 a moderate, and .64 a strong effect size.

Results

Preliminary Analyses

In terms of internal validity, the EFA revealed the presence of three facets, with each item loading substantially (factor loading $\geq$ .55) on a single factor: (a) 6 items designated a success-based form of AICS (6 items, α = .91), (b) another 6 items fell on a failure-based form of AICS (6 items, α = .89), and (c) and 6 items loaded on a general factor of AICS (6 items, α = .84). The cross-loadings were all less than .49. Second, we conducted a higher-order CFA in which the items were modeled as indicators of three latent facets as distinguished by the EFA, which, in turn, served as indicators of a single higher-order factor. The model of the higher-order CFA fitted the data well ($\chi^2(132) = 353.21$, $p < .001$; CFI = .94; SRMR = .04, RMSEA = .05). Therefore, this second-order factor was included as a latent construct in the integrated model. The total AICS scale showed high reliability (α = .93). In terms of construct validity, the Pearson correlations indicated that this scale yielded a meaningful pattern of associations with the related constructs in its nomological network. Specifically, AICS was positively correlated with extrinsic goal promotion (r = .32, $p < .01$) and negatively correlated with intrinsic goal promotion (r = -.22, $p < .01$) and global self-worth (r = -.46, $p < .01$). The results of Pearson's correlations between all study variables

are shown in Table 1. AICS showed a positive association with a controlling style and a negative association with a structuring style. Regarding the contextual predictors of AICS, coaches' perceived evaluative climate, as conveyed by both the club board and the athletes' parents, was positively related to AICS.

Main Analyses

Consistent with the correlations, SEM results (model fit: $\chi^2(647) = 1606.20$, $p < .001$; CFI = .91; SRMR = .06, RMSEA = .05) indicated that AICS was positively related to a controlling style and negatively related to a structuring style (Research Question 1). However, only pressure coming from club board members was positively related to AICS, whereas pressure from athletes' parents was not (Research Question 2). AICS served as an explanatory mechanism between the experienced pressure from the club board on the one hand and a controlling coaching style (indirect effect β = .11, $p < .001$; partial mediation) and a structuring coaching style (indirect effect β = -.08, $p < .001$; full mediation) on the other hand. Because parental pressure did not show a unique association with AICS, no such intervening role of AICS was found in the relation between parental pressure and either a controlling (indirect effect β = .03, $p = .073$) or a structuring coaching style (indirect effect β = -.02, $p = .083$) (Figure 1) (Research Question 3). The effect size was small for a structuring coaching style ($R^2 = .12$), and moderate for AICS ($R^2 = .19$) and a controlling coaching style ($R^2 = .25$) (Ferguson, 2009).[1,2]

When we included coaches' global self-worth as a covariate in the prediction of AICS (β = -.44, $p < .001$), a controlling (β = -.01, $p = .876$), and a structuring coaching style (β = .41, $p < .001$), the results of

[1] As a fourth, more exploratory aim, we considered the possibility that AICS might play a moderating role in the associations between contextual or athlete-related pressures and the coaching styles. Results are presented in the online supplementary material (Appendix A).

[2] In supplementary analyses, we conducted multigroup analyses to examine whether the findings were independent of competition level and sport type. Results are presented in the online supplementary material (Appendix B).

the integrated model remained the same, except for a non-significant relation between AICS and a structuring coaching style (β = -.03, *p* = .600) and, as a result, a non-significant indirect effect of an evaluative club board on a structuring coaching style (β = -.01, *p* = .603).

Brief Discussion

The results of Study 1 were promising for three reasons. First, the newly developed AICS scale proved to be both reliable and valid in this large sample of coaches from a variety of sports. AICS correlated with construct validation measures in predictable ways: as coaches scored higher on AICS, they reported promoting fewer intrinsic and more extrinsic goals and reported lower overall self-worth. In terms of associations with the coaching styles, AICS was positively associated with a controlling style and negatively associated with a structuring style. The hypothesis regarding the role of a perceived evaluative club climate was only partially supported by the results, as only pressure coming from the club board (but not from the athletes' parents) was associated with more AICS, which in turn had an indirect effect toward the use of more controlling and less structuring coaching practices.

Study 2

Study 2 tested the same integrated model as in Study 1, but extended Study 1 in three important ways. First, because coaches may face not only contextual pressure (i.e., from parents and club board members) but also pressure stemming from athletes' performance, we examined the role of poor athlete performance as an additional predictor of coaches' state AICS.

Second, to further examine the relation between the contextual (i.e., evaluative climate as conveyed by board members or parents) and athlete-related (i.e., poor performance) pressures and AICS, Study 2 used a vignette-based design. We manipulated these pressures in several realistic, and thus ecologically valid, hypothetical vignettes to examine their role in activating state AICS. Such a vignette-based methodology has several advantages, including the ability to (a) experimentally isolate different pressures (which tend to covary in practice), (b) test the interactions among these pressures

since experimental induction carries less bias than a self-report measure that may already be colored by the degree of AICS among coaches, and (c) disentangle the role of AICS at both the trait and state levels. Whereas *trait* AICS indicates rather stable individual differences in coaches' AICS across situations and time, *state* AICS indicates the level of coaches' AICS in a given situation.

Third, to gain deeper insight into the hypothesized association between contextual and athlete-related pressures and AICS, we considered the additional intervening role of coaches' experiences of need frustration. Previous research has shown that the relation between an evaluative climate and a controlling coaching style can be partially explained by coaches' frustration of their basic psychological needs for autonomy, competence, and relatedness (Morbée et al., 2020). Therefore, we considered need frustration as an additional explanatory variable in our integrated model. Specifically, we hypothesized that the presence of the different pressures would be positively related to need frustration, which would be related to the coaching styles via higher state AICS.

Method

Participants

A convenience sample of 318 youth soccer coaches (athlete age groups U14 to U21) participated in the current study (M_{age} = 38.94 years; 97.8% male). They had a mean of 10.17 years of coaching experience (*SD* = 8.31, range 0-45 years) and spent 6.78 (*SD* = 2.75) hours per week coaching. They coached teams that competed at various levels (22.6% non-competitive or recreational, 66.7% provincial or statewide, and 10.7% national or international).

Procedure

First, coaches who were willing to participate were asked to sign an online informed consent form. Coaches who agreed to the consent form were directed to an online baseline questionnaire that assessed their background characteristics and AICS (i.e., trait level). The experimental phase was then scheduled approximately one month later. In the experimental phase, all soccer coaches were randomly

assigned to one of four experimental groups (i.e., representing two between-subjects factors) in which (a) athlete performance (i.e., success versus failure) and (b) the club climate (i.e., an evaluative versus non-evaluative climate) were manipulated through vignettes, delivered via a two-page comic book (see Appendix C in the online supplementary material for an example). In developing these comic books, we took into account the recommendations formulated by Aguinis and Bradley (2014). In the comic book, participants were introduced to a youth soccer coach (i.e., Jean-Marie) working at a fictional soccer club in Belgium and were asked to imagine that they were the coach in the comic book. Each coach was asked to read two comics, one comic for each source of an evaluative climate, that is, pressure coming from the club board and from the athletes' parents. Thus, the source of the induced evaluative climate served as a within-subjects factor and was presented in a counterbalanced manner to avoid order effects.

Regarding the manipulation of athlete performance, participants were either informed that the youth team was currently in a "winning mood" or that the team was having a rather bad period. Specifically, in the success condition, the participant read that the team was on top of the league and only had to play upcoming games against lower-ranked teams, and had won the last game. In the failure condition, the participant was told that the team was at the bottom of the league, had upcoming games against highly ranked teams, and had lost the previous game. The manipulation of an evaluative club climate (relative to a non-evaluative climate) was operationalized by a focus on maintaining the good name and reputation of the soccer club (relative to a focus on fun and progress) and an emphasis on winning each game (rather than on the effort and teamwork). Although the length and nature of the operationalization of the club climate were kept constant across the two sources (i.e., club board vs. parents), the exact situation and wording were slightly adjusted to maintain high ecological validity.

After reading the first comic book, coaches completed a paper-and-pencil questionnaire that included items assessing the credibility of the vignettes, two manipulation checks, state AICS,

anticipated need-frustration experiences, and anticipated controlling and structuring practices during the following practice or game if they were the coach of the soccer team in the described, fictional sports club. The same procedure was repeated after they had read the second comic book. The study was approved by the ethics committee of [UNIVERSITY BLINDED].

Measures

Pre-Experimental Measures.

Trait Athlete-Invested Contingent Self-worth. Coaches' trait AICS was measured using the same 18-item scale as in Study 1. In this sample, the scale had an internal consistency of $\alpha = 92$.

Post-Experimental Measures. All items were rated on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Credibility. The credibility of the vignettes was assessed with two items, i.e. "The behavior of the club board/parents is credible" and "There are sports clubs where things are done this way". The average credibility of the vignettes was 5.44 on a 7-point scale (*SD* = 1.11), which corresponds to the response option "(rather) credible".

Manipulation Checks. Participants answered questions about their perceptions of athletes' performance (2 items; e.g., "The athletes of coach Jean-Marie achieve poor performances") and their perceptions of an evaluative climate conveyed by club board members or parents (1 item; "Coach Jean-Marie feels pressured by the club board/parents to achieve good performances with his athletes"), which served as a manipulation check.

State Athlete-Invested Contingent Self-worth. After reading the stem "If I were the coach in this club, the performance of my athletes would...", participating coaches rated items that tap into their anticipated state AICS, using a subset of 6 items from the pre-experimental measure, but adapted to the situation at hand. Specifically, three items were worded negatively and reversed for analyses (i.e., "…not affect how valuable I feel as a coach"), and three items were worded positively (e.g., "…determine the

extent to which I consider myself a good or bad coach"). The total scale had a Cronbach's alpha of .82. As theoretically expected, state AICS was moderately positively correlated with trait AICS (r = .46, p < .001).

Need Frustration. The coaches' anticipated need frustration was measured using a sport-adapted version of the Basic Psychological Need Satisfaction and Frustration Scale (Delrue et al., 2019). After reading the stem "If I were coaching in this club as a coach,..." participants responded to items assessing their anticipated need frustration with two items per need (6 items; e.g., "I would feel that I would never manage to coach well", α = .85).

Controlling and Structuring Coaching Behaviors. In this study, we used a different questionnaire than in Study 1 to assess coaching style for two main reasons. First, the SIS-Q (Delrue et al., 2019) used in Study 1 is a long instrument (i.e., 15 situations for which coaches must report their anticipated controlling and structuring style), which made it unfeasible to complete twice (i.e., after each of the two vignettes). Second, the SIS-Q requires coaches to report their coaching style in a specific situation (e.g., the beginning of a training session). This situation-based approach is incompatible with the vignette design of this study, in which coaches had to keep in mind the experimentally manipulated vignette rather than the situation from the questionnaire. To obtain a set of items assessing a controlling and structuring coaching style, we performed multidimensional scaling (MDS) analyses on an external dataset of 600 coaches who completed both the SIS-Q (Delrue et al., 2019), the Controlling Coach Behaviors Scale (Bartholomew et al., 2010), and a sport-adapted version of the Teacher as Social Context Questionnaire (Belmont et al., 1988). Details of this analysis can be found in the online supplementary material (Appendix D). This procedure resulted in a total set of 16 items. After reading the stem "If I were coach Jean-Marie, I would do the following during the next training/game:…" participants responded to items assessing their anticipated controlling style (8 items; e.g., "I would insist that my athletes have to prove what they're worth"; α = .80) and structuring coaching style (8 items;

e.g., “I would explicitly affirm confidence in the abilities of my athletes”; α = .77).

Plan of Analyses

All statistical analyses were performed with RStudio version 2022.02.3 (RStudio, 2022). As part of the preliminary analyses, we examined the bivariate correlations between all variables. We then conducted a latent variable SEM, taking into account the nested structure of the data, to examine the interaction between the source of the contextual pressure (i.e., vignette-based manipulation of pressure by the club board versus parents) and the order in which these vignettes were presented, to rule out order effects of vignette presentation. In addition, two regression models with random intercepts tested whether the two manipulations had their intended effects on the manipulation checks.

For the primary analyses, we tested an integrated model with latent variables through SEM that accounted for the nested structure of the data (as each coach read two vignettes). Similar to the first study, for constructs with eight or more items, the item-to-construct balance technique was used for parceling (Little et al., 2002). Specifically, in a first step, we modeled a controlling and a structuring style as outcomes of state AICS (Research Question 1), and the two dummy-coded manipulations (i.e., evaluative versus non-evaluative climate; poor versus good athlete performance) and their contrast-coded interaction (i.e., the evaluative climate *and* poor athlete performance condition versus the three other conditions) as predictors (Research Question 2). In a second step, we included need frustration to test a four-step model in which the predictors relate to need frustration, which in turn relates to state AICS, which, in turn, relates to the coaching styles (Research Question 3). In both steps, we controlled for coaches’ age and gender in the prediction of all endogenous variables.

To test the robustness of the model, we examined whether (a) the results were the same when the pressure came from club board members versus athletes’ parents by including interaction effects between the source of pressure (club board versus parents) and the manipulation of pressure, and (b) the associations of the integrated model persisted after adding trait AICS as a covariate in the

prediction of all endogenous variables.

Several indices were used to assess model fit, namely the χ^2 test, the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). Acceptable fit was indicated by CFI values of .90 or greater, and SRMR and RMSEA values of .08 or less (Hu & Bentler, 1999). To assess effect sizes, we follow the recommendations of Ferguson (2009), who states that for R^2 in the social sciences, .04 represents a small, .25 a moderate, and .64 a strong effect size.

Results

Preliminary Analyses

Pearson's correlations are presented in Table 2. Coaches' age and years of experience were negatively related to anticipated need frustration, trait and state AICS, and controlling coaching; and positively related to structuring coaching. As in Study 1, trait and state AICS were positively related to a controlling style, and negatively related to a structuring style. Next, because the results of the SEM indicated that the relation between the contextual pressure and the outcomes did not depend on vignette order (p = .331), we did not include vignette order as a covariate in subsequent analyses. Finally, the results of the regression models indicated that our manipulations worked well. Coaches in the two good performance conditions (M = 2.11) perceived higher athlete performance than coaches in the poor performance conditions (M = 3.63) ($b_{\text{poor performance}}$ = 1.50, t(316) = 11.28, p < .001). Note that a higher score indicates a perception of poor athlete performance. In addition, coaches in the two evaluative conditions (M = 5.65) experienced more contextual pressure than those in the non-evaluative conditions (M = 2.14) ($b_{\text{non-evaluative}}$= -3.52, t(315) = -27.39, p < .001). In follow-up analyses examining the two sources of pressure separately, the manipulation of pressure proved successful for both an evaluative club board ($M_{evaluative}$ = 5.94 and $M_{non\text{-}evaluative}$ = 2.14; $b_{\text{non-evaluative}}$= -3.80, t(309) = -23, p < .001) and evaluative parents ($M_{evaluative}$ = 5.36 and $M_{non\text{-}evaluative}$ = 2.13; $b_{\text{non-evaluative}}$= -3.24, t(307) = -20.64, p <

467 .001). However, the source of contextual pressure was related to coaches' reports of perceived pressure
468 (b = .56, t(311) = 2.89, p < .01). Specifically, consistent with the findings of Study 1, coaches reported less
469 experienced pressure after reading a vignette in which the pressure came from parents (M = 5.36)
470 compared to a vignette in which the pressure came from the club board members (M = 5.94).

471 ***Primary Analyses***

472 The initial SEM yielded a questionable model fit ($\chi^2(129) = 340.69$, $p < .001$; CFI = .86; SRMR =
473 .05, RMSEA = .05). Based on the modification indices, we allowed the error terms of two conceptually
474 closely related state AICS items to covary, which improved the model fit ($\chi^2(128) = 238.70$, $p < .001$; CFI =
475 .93; SRMR = .05, RMSEA = .04) (Hox & Bechger, 1998) (Figure 2a). Results indicated a significant positive
476 association between state AICS and controlling coaching, and a significant negative association with
477 structuring coaching (Research Question 1). However, among the predictors, only experimentally
478 induced athlete performance was significantly related to coaches' state AICS. However, rather than
479 being positively associated with AICS, poor performance was negatively associated, suggesting that
480 coaches were more likely to link their self-worth to their athletes' performance when they performed
481 well than when they performed poorly (Research Question 2). Neither the induced contextual pressure
482 nor the interaction between contextual pressure and athlete performance reached significance. In
483 addition, there were no significant indirect effects of the (interaction between the) manipulations on
484 one's coaching style via state AICS (p-values ranging from .058 to .285) (Research Question 3). The effect
485 sizes were small for state AICS (R^2 = .07) and a controlling (R^2 = .08) and structuring (R^2 = .14) coaching
486 style (Ferguson, 2009).

487 Furthermore, the results of the second SEM including anticipated need frustration
488 experiences as an additional intervening variable (Figure 2b; model fit $\chi^2(248) = 487.78$, $p < .001$; CFI =
489 .91; SRMR = .06, RMSEA = .04) provided evidence for two significant indirect effects of evaluative
490 climate manipulation on one's anticipated coaching style via need frustration and subsequent state

levels of AICS (indirect effect β = .02, $p < .05$ for control and β = -.04, $p < .01$ for structure). Specifically, an evaluative climate was significantly related to more need frustration. Need frustration, in turn, was related to higher levels of state AICS, which was related to more controlling and less structuring coaching behaviors. The effect sizes for state AICS ($R^2 = .12$), a controlling ($R^2 = .09$) and a structuring ($R^2 = .14$) coaching style were small, while the effect size for need frustration was moderate ($R^2 = .31$) (Ferguson, 2009).

Finally, we tested the robustness of the model by conducting two additional analyses. First, we examined whether the results differed depending on whether the pressure was exerted by club board members or by the athletes' parents. The results showed that when contextual pressure was exerted, it did not matter whether the pressure came from the club board members or parents in terms of state AICS (β = .02, $p = 599$), controlling (β = -.01, $p = .517$), or structuring (β = .03, $p = .094$) coaching. However, in the model that included need frustration, coaches who experienced pressure from the club board reported more need frustration than coaches who experienced pressure from the parents (β = .16, $p < .01$). Second, we examined whether the results remained intact after including trait AICS as a covariate in the prediction of all endogenous variables (i.e., need frustration: β = .19, $p < .01$; state AICS: β = .45, $p < .001$; a controlling coaching style: β = .34, $p < .001$; and a structuring coaching style: β = -.32, $p < .001$; results consistent with those of Study 1). Results indicated that contextual pressure remained positively related to need frustration (β = .59, $p < .001$) and need frustration remained positively related to state AICS (β = .19, $p < .01$), but state AICS was no longer related to a controlling (β = -.01, $p = .936$) or structuring (β = -.09, $p = .191$) coaching style, resulting in non-significant indirect effects.

Brief Discussion

The results of this vignette-based design were largely, but not completely, consistent with the findings of Study 1. First, the positive relation between AICS and controlling coaching and the negative relation between AICS and structuring coaching were replicated. Second, and contrary to our

hypotheses, poor athlete performance was associated with lower rather than higher state AICS, and an evaluative climate did not show any direct relations with AICS. However, to the extent that an evaluative climate was related to more need frustration, an indirect effect was observed in a four-step model, with an evaluative climate relating to AICS through experiences of need frustration.

General Discussion

The present study examined a number of predictors and outcomes of AICS and offers a number of theoretical and practical implications. From a theoretical perspective, the present study contributes to our knowledge of the antecedents that are theoretically hypothesized to elicit a controlling and structuring coaching style. Some studies have already examined the antecedents of a controlling or autonomy-supportive coaching style (see Matosic et al., 2016 for a review), but none have considered the antecedents of a structuring coaching style (with the exception of Rocchi & Pelletier, 2017). In addition, the present study considered an antecedent that has not been previously examined in the sports context, namely, athlete-invested contingent self-worth. Specifically, we found that when coaches' self-worth is contingent on their athletes' performance, they are more likely to adopt a harsh and forceful approach. This is consistent with previous research in the parenting and medical contexts, showing that other-invested contingent self-worth predicts the use of controlling behaviors (Duprez et al., 2019; Steffgen et al., 2022; Wuyts, Vansteenkiste, et al., 2015). Extending this body of knowledge, the results of the current study showed that coaches high in AICS invested less in providing appropriate guidance, feedback, and expressions of trust to their athletes. This is relevant because previous research has shown that a coaching profile characterized by the simultaneous presence of demotivating practices and the absence of motivating practices produces the worst pattern of athlete outcomes, such as the lowest basic need satisfaction and autonomous motivation (Haerens et al., 2018). Because AICS is associated with both a more controlling and less structuring style, it may be an important risk factor for decreased motivation and well-being in youth athletes.

In addition, this study sought to gain insight into the predictors of AICS by considering the context in which sports coaches operate, as well as athlete performance. Although the cross-sectional survey (Study 1) showed that the evaluative climate perceived by coaches and conveyed by club board members was related to trait differences in AICS, the results of the experimental vignette study (Study 2) indicated that the induction of an evaluative climate was unrelated to situational state levels of AICS. One interpretation is that coaches may need to be exposed to an evaluative club climate on a long-term and chronic basis in order to make their self-worth more dependent on athlete performance. Longitudinal research would be useful to examine whether repeated and long-term exposure to an evaluative climate predicts a greater likelihood of becoming controlling over time. For example, longitudinal research has shown that parents' child-based contingent self-worth did not influence how they interacted with their child on the day the child failed, but it did the day after (Ng et al., 2019).

On the other hand, the current findings suggest that an evaluative context is indirectly related to state AICS via feelings of need frustration. Indeed, research in the sports context has shown that the relation between an evaluative climate and controlling coaching occurs in part through need frustration (Morbée et al., 2020). The present study extends previous research by adding AICS as an additional underlying mechanism. Coaches who question their abilities (competence frustration), feel cornered to perform well (autonomy frustration), and feel abandoned (relatedness frustration) in an evaluative climate, may more readily view their athletes' performance as critical to maintaining or enhancing their self-worth. This suggests that coaches may make their self-worth dependent on their athletes' performance in order to compensate for their frustrated psychological needs.

Study 1 suggested that, unlike the evaluative climate provided by club board members, the evaluative climate provided by parents was not associated with AICS. Consistent with this finding, the additional analyses in Study 2 showed that coaches who experienced pressure from the club board reported more need frustration than coaches who experienced pressure from the parents. One possible

explanation is that coaches place more value and importance on the critical opinions of club board members than on those of parents because club board members generally have more knowledge and authority to evaluate coaches than parents do. This may make their opinions more relevant and their self-worth more dependent on those opinions. The finding that coaches are less susceptible to pressure from parents is encouraging. It suggests that coaches may be less prone to parental pressure and related contingent self-worth, to the benefit of the youth athletes.

Contrary to our hypotheses based on previous research, the vignette-based results of Study 2 showed that poor athlete performance was associated with lower state AICS. This suggests that when athletes perform poorly, coaches are less likely to invest their self-worth in their athletes. It is possible that this tendency to detach one's self-worth from athletes' performance reflects a protective mechanism to maintain one's self-worth. To shed light on this explanation, it would be interesting to conduct qualitative work to better understand how coaches' AICS varies dynamically as a function of athlete performance. If it is a defensive response pattern following poor performance, it should be evident in other indicators, including a more defensive attribution pattern following failure (Weiner, 1985). An alternative account of the present findings is that good athlete performance may lead coaches to more strongly associate their self-worth with that performance, possibly to confirm or increase their overall level of self-worth. These explanations are consistent with well-known phenomena in sports, where individuals openly associate themselves with the team after victories (basking in reflected glory), but distance themselves after defeats (cutting off reflected failure) (Lee, 1985).

These findings are important from an applied perspective, as gaining insight into the processes underlying coaches' (de)motivating styles is important for developing effective intervention programs to the benefit of the motivation and well-being of youth athletes. While available interventions for sports coaches mainly focus on teaching more motivating coaching behaviors (e.g., Cheon et al., 2015; Reynders et al., 2019), this study showed that it may also be important to intervene earlier in the

motivational chain by addressing risk factors for controlling coaching. Therefore, based on the findings of this study, it is recommended that interventions increase coaches' awareness of the fragile nature of their self-worth and the circumstances under which AICS may be activated. Such increased awareness may prevent coaches from resorting to controlling practices as a cost-effective strategy to preserve their self-worth. In addition to raising awareness, it may be useful to teach coaches how to deal with these situations, for example, by strengthening their coping skills to manage pressure (e.g., see Skinner & Beers, 2016 for an example in the educational context) or by engaging in need crafting to maintain or increase their experiences of need satisfaction (e.g., see Laporte et al., 2022 for a need-crafting intervention outside of the sports context). If critical and dynamic predictors such as AICS are not addressed in intervention research, the effects of training focused on improving coaches' motivating skills may be short-lived or situation-specific. That is, coaches may still be vulnerable to using a more controlling or less structuring approach in situations where the coaches' basic psychological needs or self-worth are threatened. In addition to interventions for coaches, these results may also have implications for interventions at the sports club level. A sports club, especially the club board, would do well to avoid an evaluative and judgmental style toward coaches, as such a climate is associated with increased perceived pressure (autonomy frustration), uncertainty about coaching skills (competence frustration), and relational tension (relatedness frustration) among coaches. Instead, it is advisable to establish a need-supportive and process-oriented climate, where coaches have a voice in determining approaches and expectations (autonomy), challenging yet attainable goals are set (competence), and a collegial atmosphere is fostered (relatedness). By preventing need frustration, coaches are less likely to base their self-worth on the performance of their athletes, which ultimately seems to benefit the coaches' motivational style toward young athletes.

Limitations and Future Research Directions

Although this study was the first to provide insights into the domain of AICS, the results should

611 be interpreted with caution given some important limitations. First, we recruited only Belgian youth
612 (U21) coaches in our sample, so the findings cannot be easily generalized to senior teams or coaches
613 from other cultures with different values and a different organized sports context. Second, our method
614 of recruitment (Study 1 via participants in a project on motivational coaching and Study 2 via
615 convenience sampling) may have ensured that the participating coaches were more motivated (and
616 even motivating) than average. Third, both studies were cross-sectional in nature. As noted above,
617 longitudinal research would provide a more rigorous test of the proposed theoretical predictors and
618 outcomes of AICS. Fourth, we relied only on coaches' self-reports, which assumes that coaches have a
619 correct view of their level of contingent self-worth and of the coaching style they use. In addition, given
620 the potential sensitivity of this topic, social desirability may also come into play. On the other hand, the
621 use of a vignette-based design in Study 2 may have limited this due to its hypothetical framing.
622 In terms of future research, new studies could consider other predictors, outcomes, and
623 moderators. In terms of predictors of AICS, the effect size was moderate for trait AICS (Study 1) and
624 small for state AICS (Study 2), suggesting that there are other important predictors at play that were not
625 included in our model. Future research may consider other predictors of AICS, such as coaches'
626 unfulfilled personal dreams and pressure from other contextual sources such as the media, given that
627 these predictors in parents have already been found to be associated with child-invested contingent
628 self-worth (Wuyts, Chen, et al., 2015). In terms of AICS outcomes, given that the current study was
629 limited to controlling and structuring styles, future research could also examine the subfacets of
630 controlling (i.e., dominating and demanding) and structuring (i.e., clarifying and guiding) coaching that
631 are distinguished within the circumplex model or, alternatively, examine the effects on the other two
632 dimensions within the circumplex model (i.e., autonomy support and chaos; see Delrue et al., 2019). In
633 addition, research in the parenting context provides evidence that AICS may also be detrimental in
634 terms of emotion and mood outcomes, such as increased feelings of depression and more anger after

failure (Otterpohl et al., 2020; Steffgen et al., 2022). Finally, future research can examine whether certain factors, such as mindfulness (Niemiec et al., 2010), may buffer against the negative outcomes of AICS.

Conclusion

This study showed that AICS among youth sports coaches is a potential risk factor for adopting a more controlling and less structuring coaching style. Since an evaluative context relates to such fragile self-worth through experienced need frustration, it is recommended to minimize the pressure of the context on coaches, for example, by creating a process-oriented club climate. Finally, it is important to increase coaches' awareness of the dynamics of AICS and how it may increase their vulnerability to adopting a controlling coaching style that has negative effects on youth athletes.

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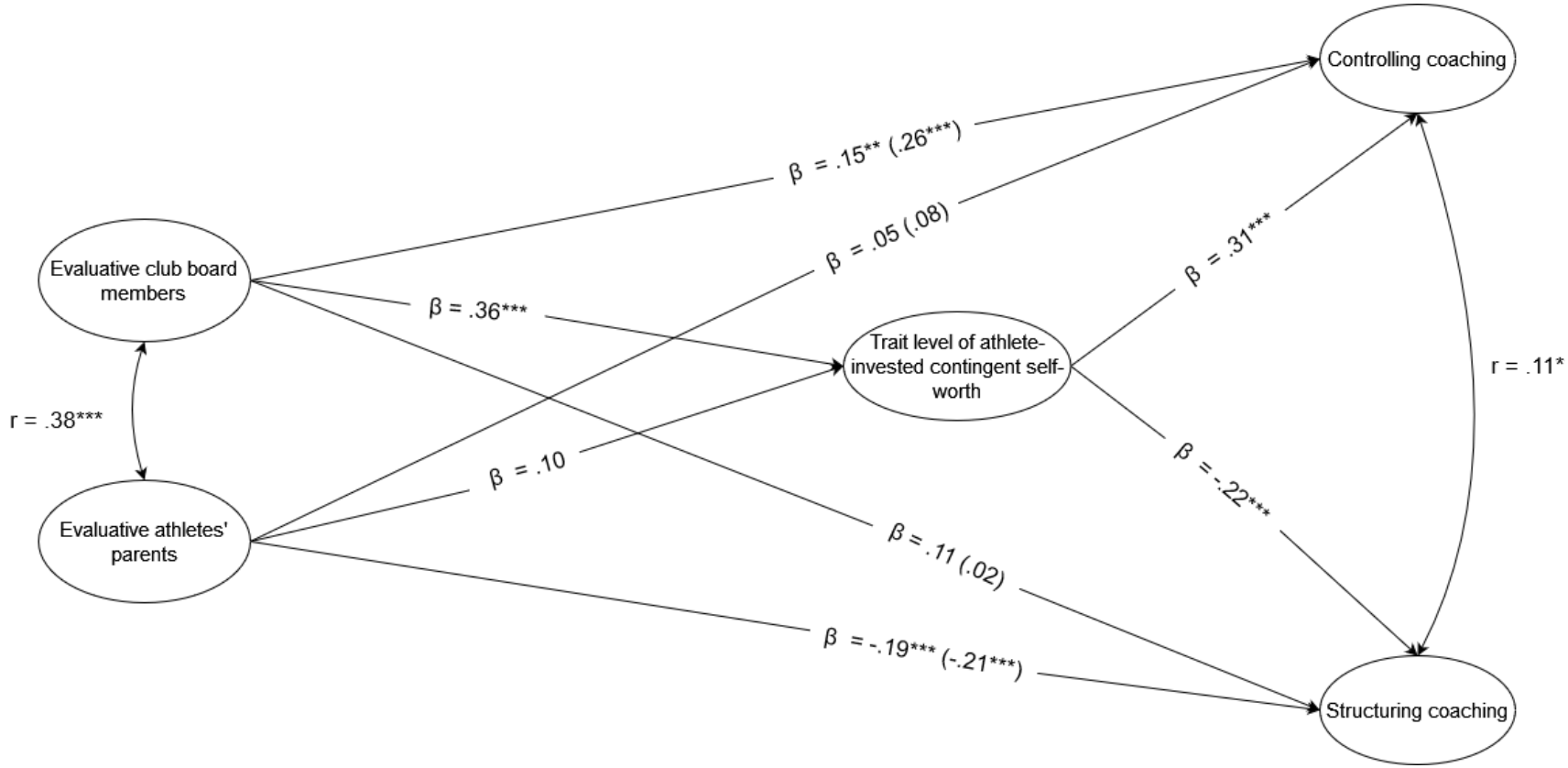
804 Figure 1 (Study 1)

805 *Results of the integrated model*



806

807 *Note. C*oefficients refer to the direct effects, with the total effects between parentheses.

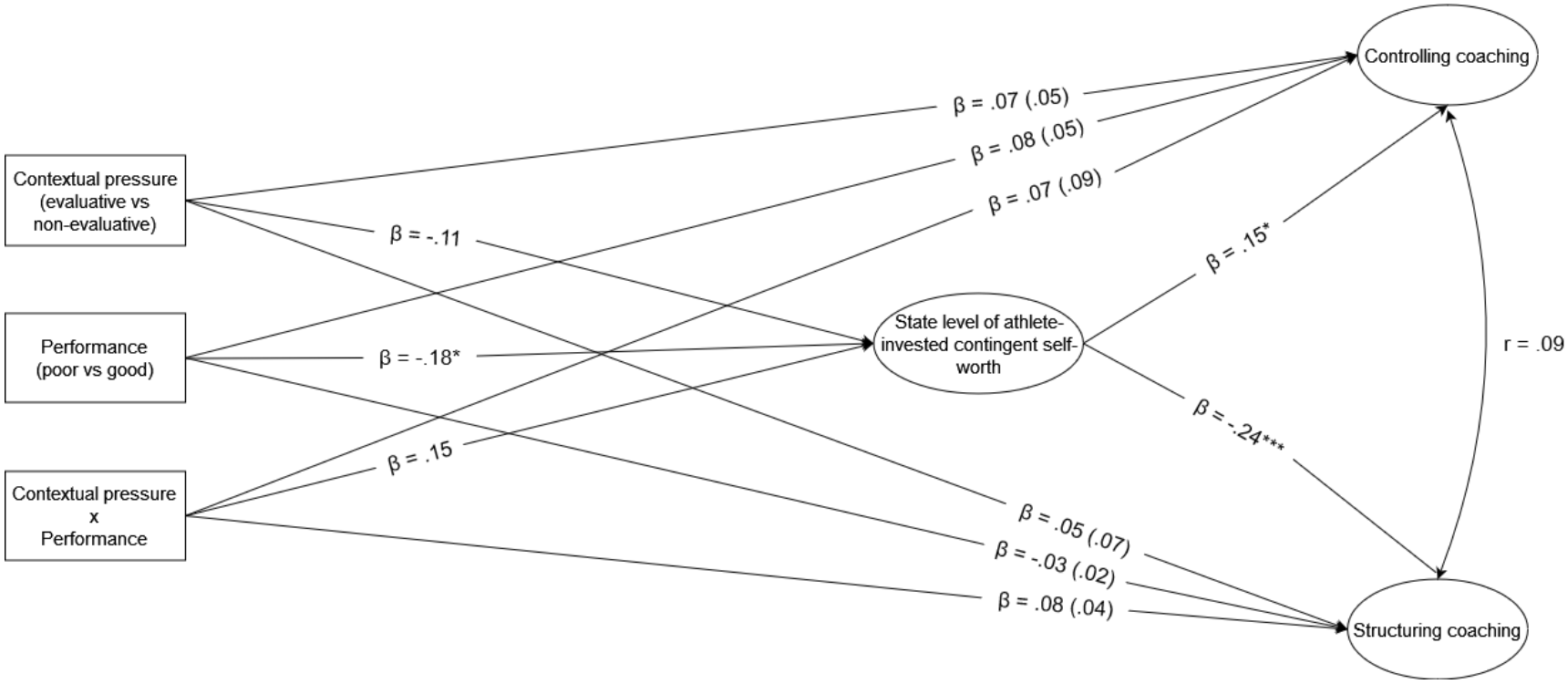
808 *Note.* For clarity reasons, the observed items of the latent variables are not shown in the figure.

809 $^{***}p$ <.001, $^{**}p$ <. 01, $^{*}p$ < .05.

810

811 Figure 2a (Study 2)

812 *Results of the integrated model without need frustration*



813

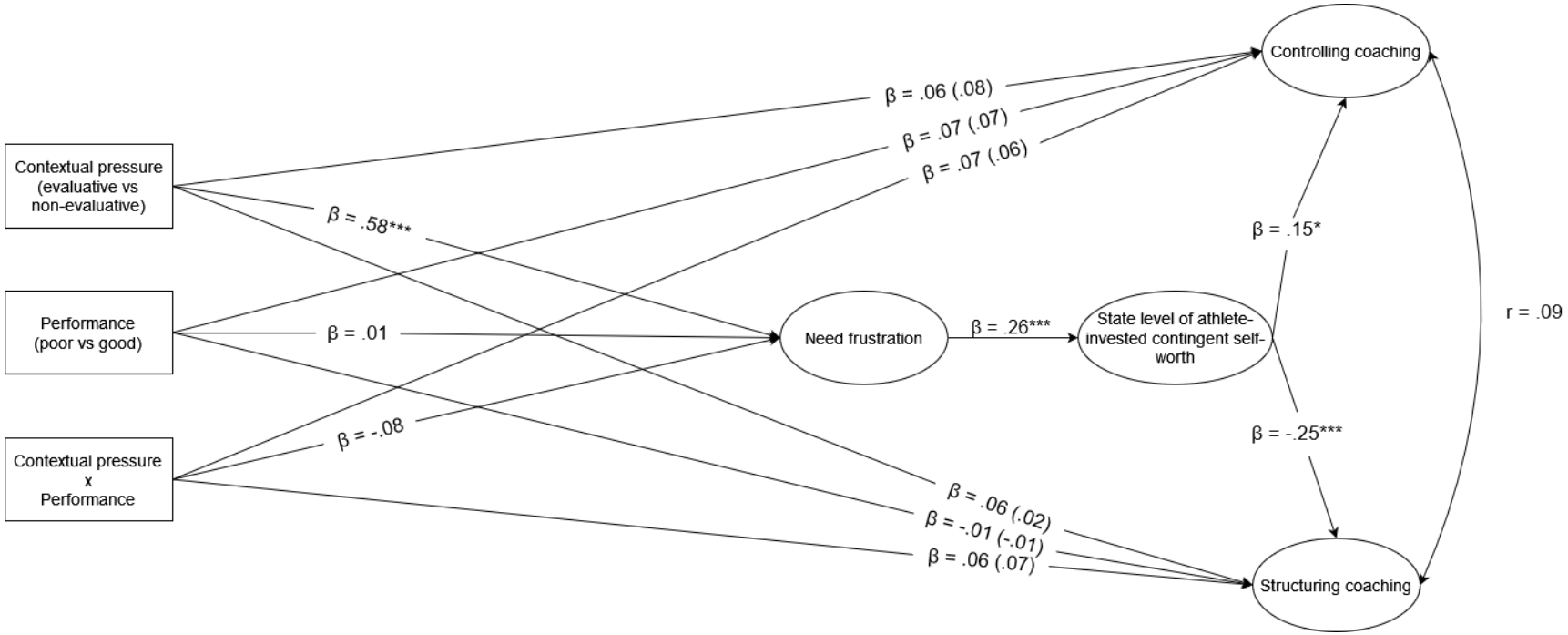
814 *Note. C*oefficients refer to the direct effects, with the total effects between parentheses.

815 *Note.* For clarity reasons, the observed items of the latent variables are not shown in the figure.

816 $^{***}p$ <.001, $^{**}p$ <. 01, $^{*}p$ < .05.

817 Figure 2b (Study 2)

818 *Results of the integrated model with need frustration*



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820

821 *Note. C*oefficients refer to the direct effects, with the total effects between parentheses.

822 *Note.* For clarity reasons, the observed items of the latent variables are not shown in the figure.

823 $^{***}p$ <.001, $^{**}p$ <. 01, $^{*}p$ < .05.

Table 1

Means, standard deviations, range, and correlations between the study variables (Study 1)

Variable	*M*	*SD*	Score range	1	2	3	4	5	6	7
Sociodemographics										
1. Age	34.37	12.42	16 - 75							
2. Coaching experience	7.43	8.61	0 - 45	.54**						
3. Hours coaching per week	4.54	3.99	0 - 30	.18**	.41**					
Study variables										
4. Evaluative club board	2.88	1.27	1 - 7	-.04	-.04	.08				
5. Evaluative parents	2.12	1.11	1 - 6.75	-.08*	.00	.07	.30**			
6. Athlete-invested contingent self-worth	2.79	0.97	1 - 5.61	-.18**	-.10*	-.02	.32**	.17**		
7. Controlling coaching style	3.10	0.95	1 - 5.80	.08	-.06	-.12**	.27**	.10*	.28**	
8. Structuring coaching style	5.73	0.64	1 - 7	.17**	.09*	.11*	-.02	-.17**	-.26**	.06

Note. M and *SD* are used to represent mean and standard deviation, respectively.

**p <. 01, *p < .05.

831 Table 2

832 *Means, standard deviations, range, and correlations between the study variables (Study 2)*

	M	*SD*	Score range	1	2	3	4	5	6	7
Sociodemographics										
1. Age	38.94	11.65	18 - 70							
2. Coaching experience	10.17	8.31	0 - 45	.56**						
3. Hours coaching per week	6.78	2.75	1 - 24	.10*	.21**					
Pre-experimental measure										
4. Trait athlete-invested contingent self-worth	2.47	0.93	1 – 5.17	-.18**	-.21**	-.08				
Post-experimental measures										
5. Need frustration	2.95	1.28	1 – 6.67	-.10**	-.18**	.02	.18**			
6. State athlete-invested contingent self-worth	3.32	1.18	1 - 6	-.24**	-.25**	-.00	.46**	.26**		
7. Controlling coaching	3.28	1.00	1 – 6.63	-.13**	-.09*	-.03	.22**	.17**	.20**	
8. Structuring coaching	6.02	0.58	1 - 7	.12**	.12**	.03	-.24**	-.08*	-.21**	-.00

833 *Note. M* and *SD* are used to represent mean and standard deviation, respectively.

834 $^{**}p <$ .01, $^{*}p <$ .05.