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Antecedents of Perceived Coach Autonomy Supportive and Controlling Behaviors: Coach Psychological Need Satisfaction and Well-Being

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Within the self-determination theory (Deci & Ryan, 2000) framework, research has considered the consequences of coaches' autonomy supportive and controlling behaviors on various athlete outcomes (e.g., motivation and performance). The antecedents of such behaviors, however, have received little attention. Coaches ($N = 443$) from a variety of sports and competitive levels completed a self-report questionnaire to assess their psychological need satisfaction, well-being and perceived interpersonal behaviors toward their athletes. Structural equation modeling demonstrated that coaches' competence and autonomy need satisfaction positively predicted their levels of psychological well-being, as indexed by positive affect and subjective vitality. In turn, coaches' psychological well-being positively predicted their perceived autonomy support toward their athletes, and negatively predicted their perceived controlling behaviors. Overall, the results highlight the importance of coaching contexts that facilitate coaches' psychological need satisfaction and well-being, thereby increasing the likelihood of adaptive coach interpersonal behavior toward athletes.

***Keywords*:** basic psychological needs, coach interpersonal style

A prominent social factor present in an athlete's sporting context is the coach (Horn, 2008); therefore, the interpersonal style employed by coaches has the potential to shape athletes' sport experiences (Vallerand & Losier, 1999). One theoretical framework that has frequently been employed to examine coach behaviors and the subsequent effects on athletes is self-determination theory (SDT; Deci & Ryan, 2000), which distinguishes between autonomy supportive versus controlling interpersonal styles. An autonomy supportive environment is created when coaches offer their athletes opportunities for input and decision making (e.g., choosing an appropriate tactic during a game), provide a sound rationale for tasks, and acknowledge athletes' feelings and perspectives. In contrast, a controlling environment is created when coaches use power-assertive techniques to pressure athletes into thinking,

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feeling, and behaving in certain ways (Mageau & Vallerand, 2003). A controlling coach will act in a highly coercive and authoritarian manner (e.g., telling athletes how they will play the game), and will use criticism or tangible rewards to manipulate athletes. This type of coach will also issue punishments (e.g., extra running or exercise repetitions) and embarrass athletes (e.g., by emphasizing past mistakes) to force them to comply with the coach's expectations and demands (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009). The two interpersonal styles have been shown to be moderately related (Pelletier, Fortier, Vallerand, & Brière, 2001), yet an absence of autonomy support does not necessarily equate to high levels of control (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010). For example, a coach who adopts a laissez-faire approach is unlikely to be autonomy supportive or controlling. Research is required, therefore, that simultaneously examines these two contrasting interpersonal styles.

A wealth of SDT-based research has indicated that many benefits exist for athletes who have an autonomy supportive coach, such as enhanced psychological well-being, basic psychological need satisfaction, self-determined motivation, and performance (Amorose, 2007; Gillet, Vallerand, Amoura, & Baldes, 2010; Mageau & Vallerand, 2003). On the other hand, the consequences for athletes who perceive their coach as controlling include poor quality motivation and increased likelihood of dropping out (Pelletier et al., 2001). Nevertheless, coaches frequently employ controlling and pressuring strategies (e.g., Fraser-Thomas & Côté, 2009). It is imperative, therefore, that researchers identify factors that determine coaches' use of these interpersonal styles, so that an autonomy supportive style can be promoted and controlling coaching styles diminished. To date, however, there is a dearth of research addressing this line of inquiry. The purpose of the current study was to examine potential precursors of perceived coach interpersonal behavior using SDT constructs—specifically, those proposed by basic psychological needs theory (BPNT; Deci & Ryan, 2000), a subtheory of the wider SDT framework. In particular, we wished to cross-sectionally explore whether satisfying coaches' psychological needs may lead them to behave toward athletes in a manner that enhances athletes' sport experiences.

Advocates of BPNT assume that for humans to function and develop optimally, three psychological needs must be satisfied: competence, autonomy, and relatedness. The need for competence is fulfilled when individuals perceive a sense of mastery through effectively interacting with their environment (Harter, 1978). The need for autonomy refers to the desire to be self-initiating in the regulation of one's actions (deCharms, 1968). Lastly, the need for relatedness concerns the desire to feel connected with, and mutually supportive of, significant others (Baumeister & Leary, 1995). A plethora of evidence exists suggesting that satisfaction of these psychological needs leads to positive outcomes, such as persistence in sport (Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002), positive exercise-related affect (Wilson, Mack, Blanchard, & Gray, 2009), work performance and psychological adjustment (Baard, Deci, & Ryan, 2004). Nonetheless, very little research has extended this line of inquiry to interpersonal behavior. As an exception, Taylor, Ntoumanis, and Standage (2008) reported that satisfaction of physical education teachers' psychological needs was positively associated with their autonomy supportive behavior toward their students; however, these authors did not measure controlling behaviors. As a further extension to Taylor and colleagues' work, we

proposed that the relationship between psychological need satisfaction and perceived interpersonal behavior would be mediated by psychological well-being.

Basic Psychological Needs and Psychological Well-Being

Psychological well-being has been described as the experience of happiness and pleasure (Diener, 1994); however, Ryan and Deci (2001) contend that well-being is not merely a reflection of positive affect, but also consists of a sense of eudaimonia. This concept refers to an individual achieving an integrated sense of self and realizing their human potential in terms of optimal psychological growth and development (Ryan & Deci, 2001). The notion of subjective vitality (i.e., a state of high positive energy emanating from the self) was developed within the SDT framework to encompass this eudaimonic definition of well-being (Ryan & Frederick, 1997).

In view of this conceptualization of well-being, it is clearly important for sports coaches, as human beings, to be psychologically well and function optimally in their coaching roles (Allen & Shaw, 2009). Supporters of BPNT consider the fulfillment of the three psychological needs to be essential in the promotion and maintenance of psychological well-being (Deci & Ryan, 2000), a proposal that has been supported in previous athlete-based research using a variety of research methods. For example, Adie, Duda, and Ntoumanis (2008), using a cross-sectional design, found that perceptions of competence, autonomy, and relatedness positively predicted subjective vitality in a sample of team sport athletes. Similarly, Gagné, Ryan, and Bargmann (2003) conducted a diary-based study among female gymnasts, and reported that fluctuations in daily satisfaction of competence, autonomy, and relatedness predicted changes in daily indices of well-being (i.e., subjective vitality, self-esteem, and positive affect). The existing sport-related BPNT research has, however, been conducted solely with athlete or student populations, ignoring the psychological needs and well-being of coaches. Testing the propositions of BPNT in the coaching population would provide insight into the social-contextual ingredients required for coaches to flourish within the coaching environment. Accordingly, it was hypothesized that coaches' competence, autonomy, and relatedness would positively predict their psychological well-being.

Psychological Well-Being and Interpersonal Behavior

Surprisingly, researchers have yet to explore whether a psychologically healthy coach may interact more positively with their athletes, compared with a psychologically unhealthy coach, yet indirect evidence may provide a rationale for such a hypothesis. For example, in the educational domain, high levels of work engagement (conceptualized as a positive, vigorous, fulfilling state of mind) have been shown to positively predict teachers' instructional behaviors in the classroom (Klussman, Kunter, Trautwein, Lüdtke, & Baumert, 2008). These behaviors included enabling students to develop new insight and understanding, proceeding at a pace appropriate to student needs, and creating a supportive social environment by showing patience with student mistakes, taking time to discuss problems, and giving personal guidance to students. This research suggests that coaches' psychological well-being would positively predict autonomy support.

Similarly, research has yet to consider the relationship between psychological well-being and a controlling interpersonal style. However, research in alternative contexts suggests a link between various concepts associated with poor psychological health (e.g., narcissism, psychopathic tendency) and aggressive, hostile, and dominant interpersonal styles (e.g., de Zavala, Cichocka, Eidelson, & Jayawickreme, 2009; Hillege, Das, & de Ruiter, 2010). Therefore, it seems reasonable to suggest that a negative relationship would exist between psychological well-being and controlling behaviors in sports coaches. Despite this limited evidence, there is a need to extend theoretical knowledge and explore the relationships among psychological well-being and autonomy supportive and controlling interpersonal styles.

Summary and Hypotheses

A considerable amount of SDT-based research has explored how coaches' interpersonal behavior can influence athletes' psychological well-being, basic psychological need satisfaction, self-determined motivation, and performance (Amorose, 2007; Gillet et al., 2010; Mageau & Vallerand, 2003). However, scant research has considered potential antecedents of coaches' interpersonal style. Based on the theoretical and empirical work discussed above (e.g., Hillege et al., 2010; Klussman et al., 2008; Deci & Ryan, 2000), we examined a process model of potential antecedents of perceived coach autonomy supportive and controlling behaviors (see Figure 1).

First, it was hypothesized that coaches' satisfaction of competence, autonomy, and relatedness would positively predict their psychological well-being. Based on theoretical (e.g., Deci & Ryan, 2000) and empirical research (e.g., Sheldon & Bettencourt, 2002), we also hypothesized that the three psychological needs would be related. In turn, psychological well-being was proposed to positively predict coaches' perceptions of their autonomy support toward their athletes and negatively predict perceptions of their controlling behaviors. These hypothesized relationships between psychological well-being and interpersonal behavior have not been previously explored. Existing research has demonstrated a moderate negative correlation between coach autonomy supportive and controlling behaviors (Pelletier et al., 2001); hence, we proposed a similar relationship. In addition, certain items employed in the current study, particularly those regarding coaches' interpersonal behaviors, were potentially susceptible to socially desirable responses. Therefore, we included a measure of social desirability to account for this possibility—something that has been overlooked in previous sport research.

Finally, to more fully explore the mechanisms posited by our hypothesized model and to further extend theoretical knowledge, we tested whether the relationships between the three psychological needs and the two interpersonal styles would be mediated by coaches' psychological well-being. By doing so, we aim to offer initial, albeit cross-sectional, evidence that satisfying the psychological needs of one person may lead them to behave in ways which create an adaptive interpersonal environment for others. This concept has scarcely been addressed in the extant literature.

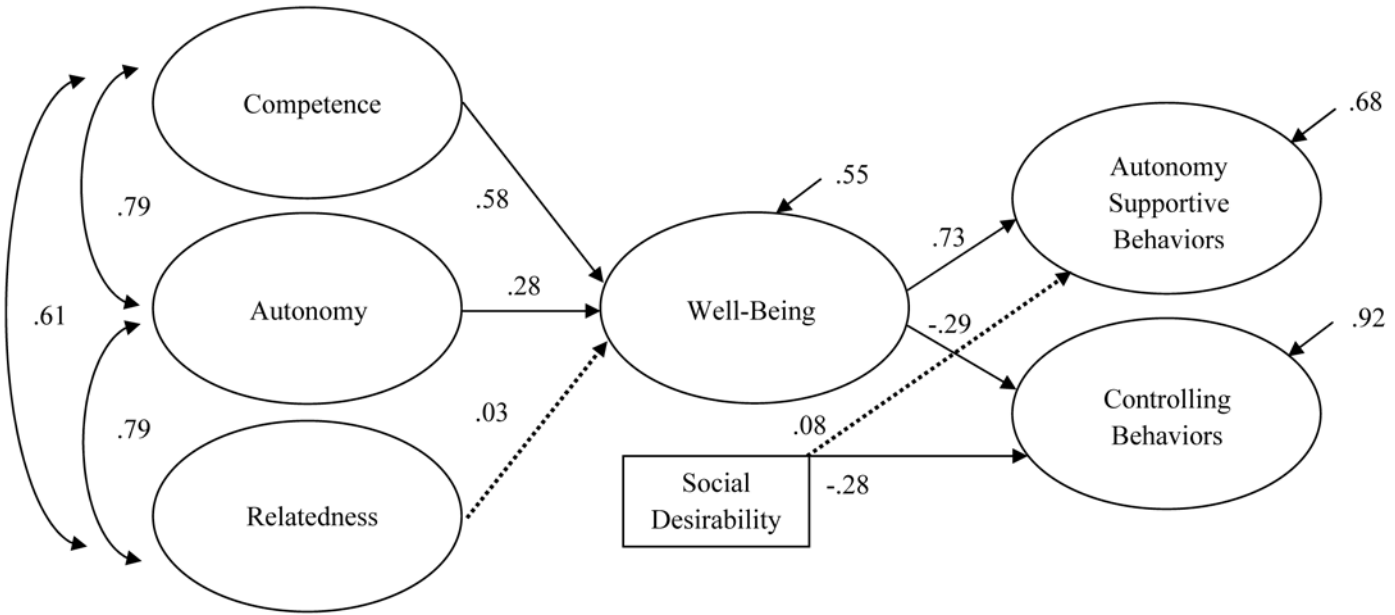

Figure 1 — Structural model of coach psychological need satisfaction, well-being, and perceived use of autonomy supportive and controlling behaviors. *Note.* All regression path coefficients are standardized, and nonsignificant pathways ($p > .05$) are denoted by dotted arrows. For presentation simplicity, factor indicators and the correlation of the error terms between perceived autonomy supportive and controlling behaviors ($r = -.32$) are omitted. Coaches' need satisfaction accounted for 70% of the variance in their psychological well-being. Coaches' well-being accounted for 54% and 16% of the variance in their perceived use of autonomy supportive and controlling behaviors, respectively.

Method

Participants and Procedures

Participants were 443 coaches (313 male, 130 female; *M* age = 41.06 years, *SD* = 14.24, range = 18–75 years) currently engaged in coaching practices. These demographics are comparable to the general coaching population in the United Kingdom (Timson-Katchis & North, 2010). Coaches had, on average, 11.12 (*SD* = 10.02) years of coaching experience, and spent 12.87 (*SD* = 12.88) hours per week coaching. Participants reported coaching one of 34 individual and team sports, and operated at a variety of competitive levels including recreational ($n = 52$), club ($n = 174$), regional ($n = 73$), national ($n = 80$), and international/professional ($n = 64$). Following approval from a university ethical advisory committee, coaches were recruited through national governing body databases, personal contacts, and sports club websites. Prospective participants were provided with detailed information that fully explained the purpose and procedures of the research, and were made aware that their involvement was anonymous and voluntary. Coaches who consented to participate then completed a multisection questionnaire that took approximately 15 min to complete.

Measures

Psychological Need Satisfaction. Satisfaction of competence, autonomy, and relatedness was measured using the Basic Need Satisfaction at Work Scale (BNSAW; Deci et al., 2001) adapted to the coaching context. In line with modifications suggested by Ntoumanis (2005), only the 12 positively worded items were used. Competence was assessed using three items (e.g., "Most days I feel a sense of accomplishment from coaching), autonomy was assessed using four items (e.g., "I am free to express my ideas and opinions when coaching"), and relatedness was assessed using five items (e.g., "People I work with in my coaching role care about me"). Coaches were asked to rate how true each of the statements were for their given coaching experiences over the last month, on a scale ranging from 1 (*not at all true*) to 7 (*very true*). Ntoumanis (2005) reported adequate factorial validity and internal consistency of the three subscales.

Psychological Well-Being. Items assessing coaches' positive affect and subjective vitality were used as indicators of a latent psychological well-being factor. Positive affect was measured using the 10-item positive affect subscale from the Positive and Negative Affect Scale (Watson, Tellegen, & Clark, 1988). Coaches indicated the extent to which they had experienced positive emotions (e.g., "enthusiastic," "proud," and "alert") while coaching during the last month, on a five-point scale ranging from 1 (*not at all or very slightly*) to 5 (*extremely*). Watson et al. (1988) reported acceptable factorial validity and internal consistency of the subscale.

Coaches' subjective vitality was measured using the seven-item Subjective Vitality Scale (Ryan & Frederick, 1997), which assessed the degree to which participants felt psychologically vigorous and energized while coaching during the last month. Items were preceded by the stem, "When I am coaching . . ." (e.g., "When I am coaching, I feel alive and vital"), and required participants to rate their experiences on a seven-point scale ranging from 1 (*not at all true*) to 7 (*very true*).

One item was a negative statement and was therefore reverse-scored before data analysis. Previous research has found the scale to have good internal consistency and factorial validity (e.g., Bostic, Rubio, & Hood, 2000; Ryan, & Frederick, 1997).

Coach Autonomy Supportive Behaviors. The six-item version of the Health Care Climate Questionnaire (HCQ; Williams, Grow, Freedman, Ryan, & Deci, 1996) adapted to the sport context, was used to assess coaches' perceptions of their autonomy supportive behavior. Previous research has adapted the HCQ items to explore athlete perceptions of coach autonomy support, and found them to have acceptable predictive validity and internal consistency (e.g., Reinboth, Duda, & Ntoumanis, 2004). Participants were asked to reflect on their coaching practices over the last month and rate the extent to which they agreed with each of the items (e.g., "I provide my athletes with choices and options") on a seven-point scale anchored by 1 (*strongly disagree*) and 7 (*strongly agree*).

Coach Controlling Behaviors. Coaches' perceptions of their use of controlling behaviors were assessed using the 15-item Controlling Coach Behaviors Scale (CCBS; Bartholomew et al., 2010), which was modified to reflect a coach's perspective. The scale measures four types of controlling behaviors, including coaches' controlling use of rewards (e.g., "I try to motivate my athletes by promising to reward them if they do well"), negative conditional regard (e.g., "I pay my athletes less attention if they displease me"), intimidation (e.g., "I embarrass my athletes in front of others if they do not do certain things"), and excessive personal control (e.g., "I try to control what my athletes do during their free time"). Bartholomew et al. (2010) reported acceptable factorial validity and internal consistency of the scale.

Social Desirability. A short form of the Marlowe-Crowne social desirability scale (Strahan & Gerbasi, 1972) was administered to assess participants' tendency to respond to questions in a socially desirable manner. Coaches were required to rate 10 items as either true or false. A socially desirable response carried a weighting of one, with a non–socially desirable answer scoring zero. The scores were then summed to produce a social desirability score for each participant. Reynolds (1982) reported that the scale had acceptable concurrent validity.

Results

Preliminary Analyses

Preliminary screening revealed no systematic patterns of missing data (1.13%); therefore, the expectation maximization algorithm (Dempster, Laird, & Rubin, 1977) was used to impute missing values. Next, confirmatory factor analysis (CFA) using the robust maximum likelihood method with EQS software (version 6.1; Bentler, 2003) was employed to determine the factor structure of the scales used. To evaluate the factorial structure of the scales, a combination of fit indices were examined. The comparative fit index (CFI) was chosen as an incremental fit index, and the standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA) represented absolute fit indices. Hu and Bentler (1999) proposed that acceptable fit of a hypothesized model to the data are indicated when the CFI is close to .95, the SRMR is close to .08, and the RMSEA is close to .06.

However, it is worth noting that these criteria may be overly restrictive when testing complex models (Marsh, Hau, & Wen, 2004). The BNSAW was found to have poor factor structure: Satorra-Bentler χ^2 (51) = 146.75, $p < .001$; CFI = .88; SRMR = .05; RMSEA = .07 (90% confidence interval [CI] = .05–.08). Examination of the standardized loadings and modification indices revealed the need to remove one item from each of the three subscales (competence, "people tell me I am good at coaching"; autonomy, "I feel like I can make a lot of inputs into deciding how my coaching gets done"; and relatedness, "I get along with people when coaching"). This revised BNSAW showed satisfactory factor structure: Satorra-Bentler χ^2 (24) = 69.25, $p < .001$; CFI = .93; SRMR = .04; RMSEA = .07 (CI = .05–.08). Variable reduction procedures of this nature are justified because the original structure is retained, but with only the best performing indicators (Hofmann, 1995). Similarly, the positive affect scale required some amendment: Satorra-Bentler χ^2 (35) = 113.81, $p < .001$; CFI = .91; SRMR = .05; RMSEA = .07 (CI = .06–.09). Modification indices suggested the removal of the item, "excited," after which the scale showed satisfactory factorial structure: Satorra-Bentler χ^2 (27) = 64.27, $p < .001$; CFI = .95; SRMR = .04; RMSEA = .06 (CI = .04–.07). Lastly, the CFA for the CCBS also revealed inadequate factor structure: Satorra-Bentler χ^2 (86) = 212.57, $p < .001$; CFI = .89; SRMR = .06; RMSEA = .06 (CI = .05–.07). Inspection of the modification indices led to the removal of one item from the Intimidation subscale ("I intimidate my athletes into doing things that I want"), which led to acceptable factor structure: Satorra-Bentler χ^2 (73) = 142.75, $p < .001$; CFI = .94; SRMR = .05; RMSEA = .05 (CI = .04–.06). The scales assessing subjective vitality: Satorra-Bentler χ^2 (14) = 38.71, $p < .001$; CFI = .98; SRMR = .03; RMSEA = .06 (CI = .04–.09), and coach autonomy supportive behaviors: Satorra-Bentler χ^2 (9) = 23.32, $p < .001$; CFI = .95; SRMR = .03; RMSEA = .06 (CI = .03–.09) were found to have acceptable factorial structure.

Descriptive Statistics and Scale Reliabilities

The means, standard deviations, and Cronbach's alpha coefficients were calculated for each subscale and are presented in Table 1. All subscales demonstrated good internal reliability ($\alpha > .70$), with the exception of the competence and autonomy subscales, which were deemed adequate ($\alpha > .60$) given the low number of items used to measure these constructs (Cortina, 1993). Coaches reported levels of competence, autonomy, relatedness, positive affect, subjective vitality, autonomy support, and social desirability above the midpoint of the respective scales, and levels of controlling behaviors below the midpoint of the scale.

The correlations between all variables are shown in Table 1. There was no evidence of multicollinearity, as all correlations were below .70 (Tabachnick & Fidell, 1996). In line with the theoretical predictions of BPNT, competence, autonomy, and relatedness needs were moderately and positively correlated with each other. The three psychological needs were moderately and positively correlated with positive affect, subjective vitality, and autonomy support, and negatively correlated with controlling behaviors. Both positive affect and subjective vitality were moderately and positively correlated with each other and autonomy support, and negatively, albeit weakly, correlated with controlling behaviors. Coach autonomy supportive and controlling behaviors were moderately and negatively correlated with each other.

Table 1 Descriptive Statistics, Cronbach's Alphas, and Correlations Between All Variables

	Variable	*M*	*SD*	α	1	2	3	4	5	6	7	8
1	Competence	5.86	1.02	.68	—							
2	Autonomy	5.35	.96	.61	.55**	—						
3	Relatedness	5.52	1.01	.78	.46**	.59**	—					
4	Positive Affect	4.08	.59	.84	.47**	.42**	.35**	—				
5	Vitality	5.38	.99	.88	.45**	.42**	.34**	.55**	—			
6	Autonomy Supportive Behaviors	5.80	.78	.82	.46**	.46**	.42**	.47**	.44**	—		
7	Controlling Behaviors	2.23	.82	.83	–.15**	–.21**	–.21**	–.10*	–.23**	–.33**	—	
8	Social Desirability Index	6.94	1.87	—	.02	.06	.12*	.06	.10*	.12*	–.26**	—

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

A Structural Model of Antecedents of Perceived Coach Behaviors

The proposed model was tested using the robust maximum likelihood estimation method (Mardia's normalized estimate of multivariate kurtosis = 41.00). Within the model (see Figure 1), the study variables were represented by latent factors (with the exception of social desirability). The two items measuring competence, the three items measuring autonomy, and the four items measuring relatedness were used as indicators of three latent factors representing the psychological needs. The positive affect and subjective vitality subscales were used as indicators of coaches' psychological well-being. The six items measuring perceived autonomy supportive behaviors were used as indicators of an autonomy support latent factor, and the four subscales of the CCBS were used as indicators of coaches' perceived controlling behaviors. Finally, social desirability was represented by a single observed variable. As autonomy supportive and controlling behaviors were dependent variables in the hypothesized model, their interrelationship can only be accounted for by correlating their error terms within EQS 6.1. Standardized factor loadings and uniqueness terms of the indicators used in the structural model (median loading of item indicators $\beta = .68$) are shown in Table 2.

Model fit indices revealed that the proposed model fit the data well: Satorra-Bentler χ^2 (199) = 344.66, $p < .001$; CFI = .92; SRMR = .05; RMSEA = .04 (CI = .03–.05). The pathway between relatedness need satisfaction and psychological well-being was nonsignificant, as was the pathway between social desirability and perceived autonomy supportive behaviors. Moderate to strong associations among competence, autonomy, and psychological well-being were found. In turn, psychological well-being was a strong positive predictor of perceived autonomy supportive behavior, and a moderate negative predictor of perceived controlling behavior. In addition, a moderate negative relationship between social desirability and perceived controlling behaviors was found. Coaches' need satisfaction accounted for 70% of the variance in their psychological well-being. Moreover, well-being explained 54% and 16% of the variance in coaches' perceived use of autonomy supportive and controlling behaviors, respectively.

Mediation Effects

Mediation analyses were conducted to test whether the relationships among autonomy and competence need satisfaction and the two coach interpersonal styles were mediated by psychological well-being. For mediation effects to be present, significant paths should be evident between the independent variables and the mediator, and also the mediator and the outcome variables (Holmbeck, 1997). Relatedness need satisfaction was, therefore, not included in the mediation analyses because it did not show a significant relationship with the mediator (psychological well-being). We first constructed a constrained model, in which indirect pathways between competence and autonomy need satisfaction and the coach behaviors via psychological well-being were estimated: Satorra-Bentler χ^2 (129) = 227.19, $p < .001$; CFI = .93; SRMR = .05; RMSEA = .04 (CI = .03–.05). Next, we constructed an unconstrained model, in which direct and indirect pathways between the psychological needs and coach behaviors were estimated. According to Holmbeck (1997),

Table 2 Standardized Factor Loadings and Uniqueness Terms of all Indicators in the Structural Equation Model

Latent Factor and Observed Indicators	Loading	Uniqueness
Competence		
Item 1	.62	.78
Item 2	.83	.55
Autonomy		
Item 1	.69	.73
Item 2	.46	.89
Item 3	.72	.69
Relatedness		
Item 1	.73	.69
Item 2	.63	.78
Item 3	.71	.71
Item 4	.70	.72
Well-being		
Mean positive affect	.72	.69
Mean subjective vitality	.71	.70
Autonomy Supportive Behaviors		
Item 1	.70	.72
Item 2	.66	.75
Item 3	.65	.76
Item 4	.63	.78
Item 5	.68	.73
Item 6	.63	.77
Controlling Behaviors		
Mean controlling use of rewards	.61	.79
Mean negative conditional regard	.75	.66
Mean intimidation	.63	.77
Mean excessive personal control	.50	.87

Note. No factor loadings are available for social desirability because this construct is an independent variable reflected by a single-item composite score.

mediation exists if the unconstrained model does not show significant improvement in fit compared with the constrained model. Although the unconstrained model demonstrated acceptable fit: Satorra-Bentler χ^2 (125) = 219.81, $p < .001$; CFI = .93; SRMR = .05; RMSEA = .04 (CI = .03–.05), a nonsignificant Satorra-Bentler chi-square difference test (Satorra & Bentler, 2001) indicated that the mediated model (i.e., our constrained model) was more parsimonious ($\Delta\chi^2 = 7.37$, $\Delta df = 4$, $p > .05$). To ascertain the significance of each mediation pathway, a series of Sobel tests (Sobel, 1982) were conducted. All four mediation pathways, between

competence need satisfaction and perceived autonomy supportive behavior, (Z = 4.21, $p < .001$), competence need satisfaction and perceived controlling behavior, ($Z = –3.18$, $p < .01$), autonomy need satisfaction and perceived autonomy supportive behavior, ($Z = 2.43$, $p < .05$), and autonomy need satisfaction and perceived controlling behavior ($Z = –2.17$, $p < .05$), were significant.

Discussion

The purpose of the current study was to test a model of potential antecedents of perceived coach autonomy supportive and controlling behaviors using the SDT framework (Deci & Ryan, 2000). The results suggest that satisfaction of coaches' basic psychological needs for autonomy and competence, but not relatedness, positively predicted their psychological well-being. Furthermore, coaches' psychological well-being was found to positively predict their perceived use of autonomy support, and negatively predict their perceived use of controlling behaviors after taking into account coaches' tendency to provide socially desirable responses. When taken in its entirety, the proposed mediation model advances the existing literature by suggesting that supporting coaches' psychological needs may help to indirectly create a positive autonomy supportive, noncontrolling environment for athletes by allowing coaches to psychologically thrive. This process has not previously been addressed in any context, as very little SDT-based literature has examined interpersonal behavior as an outcome of psychological need satisfaction. In the following sections we discuss each step of the mediation process in turn.

Basic Psychological Needs and Psychological Well-Being

In the current study, basic psychological need satisfaction explained 70% of the variance in psychological well-being, which is comparable to previous research in the sport domain (e.g., Quested & Duda, 2010). Aligned with BPNT and previous research with athletes (Adie et al., 2008; Gagné et al., 2003; Quested & Duda, 2010; Reinboth et al., 2004), the results of the current study suggest that coaches' autonomy need satisfaction is positively related to their psychological well-being. This is consistent with Ryan and Frederick's (1997) argument that autonomy plays a crucial role in the development of psychological health, as well-being cannot be attained when a person feels controlled in their actions. Thus, coaches who experience a sense of volition and feel that they are the origin of their behavior may psychologically thrive within their coaching role. In comparison, coaches who feel powerless and controlled to engage in certain coaching practices may experience lower psychological well-being. This implies that significant social agents within the coaching environment (e.g., head coaches, performance directors, club managers) should provide coaches with a sense of autonomy by allowing them opportunities for decision-making and personal input with regards to how they conduct training sessions, how they manage their athletes, and how they optimally prepare individuals and teams for competition. These social agents may also support coaches' sense of autonomy by acknowledging coaches' feelings and perspectives, engaging in two-way feedback processes, and providing them with input into the organization itself (Allen & Shaw, 2009).

Within the current study, competence emerged as the strongest predictor of psychological well-being. This finding is consonant with previous athlete-based research (e.g., Adie et al., 2008; Quested & Duda, 2010; Reinboth et al., 2004). Therefore, sport clubs should aim to facilitate coaches' perceptions of competence by offering continued professional development via training courses, providing coaches with positive and instructional feedback concerning their coaching techniques, and by structuring clear and progressive coaching goals.

Contrary to our hypothesis, relatedness need satisfaction did not predict coaches' psychological well-being. This is inconsistent with previous work in which relatedness predicted positive affect (Quested & Duda, 2010) and subjective vitality (Adie et al., 2008) in team sport and vocational dance contexts. Nonetheless, Deci and Ryan (2000) proposed that, in certain contexts, relatedness may play a more distal role with regards to the development and maintenance of psychological growth and well-being, compared with competence and autonomy. Indeed, the athletes studied in previous research were engaged in team sports, whereas the majority of coaches in the current study (approximately 74%) operated within individual sports. Furthermore, the dancers studied in previous research existed within an explicit social group of dancers who they lived with, whereas many coaches tend to work in the absence of a peer group of other coaches. Despite these possible explanations, researchers adopting alternative theoretical frameworks may not subscribe to such a diminished role of relatedness in certain contexts (e.g., Leary & Baumeister, 2000). Therefore, it seems necessary to further explore the underlying reasons for the lack of association between relatedness and well-being in certain contexts. Examining potential differences between team and individual sports may represent such a research avenue.

Psychological Well-Being and Interpersonal Behavior

Results from the current study indicated that coaches' psychological well-being positively predicted their perceived autonomy supportive behaviors toward their athletes. This finding was in line with our initial hypothesis, as previous research has suggested that when teachers are highly engaged within their teaching roles, this leads them to use more adaptive teaching strategies toward their students (Klussman et al., 2008). Therefore, a coach who experiences heightened psychological well-being in their coaching role is likely to provide athletes with choice, responsibility, and engage in open discussions with athletes regarding their feelings, ideas, and opinions about training sessions and competition. Such autonomy supportive strategies are likely to facilitate adaptive athlete consequences (Amorose, 2007; Gillet et al., 2010; Mageau & Vallerand, 2003).

Our results also showed that coaches' psychological well-being negatively predicted their perceived controlling behaviors after taking into account coaches' tendency to provide socially desirable responses. If coaches are prevented from psychologically flourishing, they may be more directive, issue more criticism, and control their athletes, compared with psychologically healthy coaches. No previous research has explored the associations among psychological well-being and these two important SDT-based interpersonal styles. In the current study, psychological well-being accounted for 54% of the variance in autonomy supportive behaviors and 16% of the variance in controlling behaviors. The findings,

therefore, contribute to the extant literature by indicating that psychological well-being should be considered an important predictor of both positive and negative interpersonal behaviors. Furthermore, these results imply that sport administrative bodies should emphasize the importance of coaches' psychological well-being, not only for the benefit of coaches, but also to help create an optimal coach-created environment for athletes.

Future Directions and Limitations

The findings in the current study can be extended in several ways. First, the data were cross-sectional in nature; therefore, we cannot clarify the direction of relationships within the model. This is particularly important with regards to the mediation analysis, which warrants caution when interpreting the results. We cannot dismiss the possibility of reverse causality (Kenny, Kashy, & Bolger, 1998) between the outcome variables (perceived autonomy support and control) and the mediating variable (psychological well-being). Nonetheless, our cross-sectional model was based on sound theory and prior research. Furthermore, Kenny et al. (1998) highlight that if the predictor, mediator, and outcome variables are measured at the same point in time multicollinearity is possible. In the current study, however, the bivariate correlations among the variables were not excessively large ($r = –.33$ to .59), indicating that multicollinearity was not an issue. With these limitations in mind, cross-lagged longitudinal or experimental designs are needed to clarify our proposed process model.

Second, the present work relied upon self-report instruments to measure the study variables. In particular, measurement of coaches' perceived interpersonal behaviors may not be an accurate reflection of actual behaviors. Although the inclusion of a social desirability measure went some way to surmount any potential bias, objective assessments of coaches' behavior (e.g., independent observations) may build upon this work. Moreover, athletes' perceptions of coach behavior would complement coaches' self-reports, especially as athletes' perceptions of the motivational environment are most pertinent in predicting athlete consequences (i.e., functional significance; Deci & Ryan, 1987).

Another limitation surrounds the necessary modifications to the BNSAW scale to measure coaches' basic psychological need satisfaction. Modifications left the competence subscale with only two items, which may have posed problems concerning empirical under-identification. We retained the competence subscale, however, because the model converged, no negative error variances were found (a sign of empirical under-identification), and both items loaded strongly onto the competence latent factor (i.e., >.40; Ford, MacCallum, & Tait, 1986; see Table 2), suggesting that using two indicators in this instance was not problematic. In view of the modifications, however, it may be worthwhile for researchers to devise a coach-specific measure to assess basic psychological need satisfaction in this population. This may be particularly important given Allen and Shaw's (2009) call for increased attention on coaches' psychological needs and well-being.

Our hypothesized model can also be extended from a theoretical and practical perspective. SDT-based research provides insight into how the social environment can satisfy one's basic psychological needs (and psychological well-being). For example, Allen and Shaw (2009) highlighted that a lack of assistance and

guidelines from sport organizations, and a lack of opportunities for formal training, feedback and networking with other coaches, may lead to the frustration of coaches' psychological needs. Taylor et al. (2008) also reported that contextual factors such as pressures from school administration, evaluation pressures, and time constraints within the lesson served to negatively impact upon physical education teachers' basic psychological need satisfaction. It would be intriguing to determine how coaches experience environmental demands, such as time constraints to optimally prepare athletes for competition, pressures regarding administration and finances, evaluations based on athlete performance, and pressure from superiors. These pressures may differ according to whether a coach is in a paid or voluntary role, as well as an assistant coach or head coach position. The current study was conducted with both full- and part-time coaches, at various competitive levels. While this provides an opportunity to generalize our results across different coaching subpopulations, future research may look to establish how the relationships proposed in the model vary as a function of job status (e.g., full-time versus part-time) and competitive level. An assessment of these contextual influences on basic psychological need satisfaction would extend the current model by providing insight into how the coaching environment may lead to the sequence of effects demonstrated in this study.

Conclusions

The present study advances the current literature in a number of ways. No previous research has examined psychological need satisfaction and well-being in a coaching population. The findings, therefore, facilitate our understanding of the importance of promoting need satisfaction in the coaching context. Moreover, this study is the first to concurrently explore the relationships among psychological well-being, autonomy supportive, and controlling interpersonal behaviors. Apart from a few exceptions, coaches' controlling interpersonal style has been largely ignored in the extant literature; however, the current investigation outlines a promising conceptual approach for understanding the mechanisms behind coach interpersonal behavior. Overall, the key finding of the study is that satisfaction of coaches' psychological needs can allow coaches to thrive, and to create an adaptive interpersonal coaching environment for athletes.

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