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## Coach Autonomy Support and Quality of Sport Engagement in Young Soccer Players

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Based on the self-determination theory (Ryan & Deci, 2000), this study tested a model of the assumed sequential relationships between perceived autonomy support, psychological need satisfaction, self-determined motivation, and enjoyment/boredom. The hypothesized mediational roles of psychological need satisfaction and self-determined motivation were also studied. In a sample of 370 young male soccer players, path analysis results offered support for the proposed model. Total mediation was supported in the case of the psychological need satisfaction in the relationship between autonomy support and self-determined motivation, and partial mediation for self-determined motivation in the links between psychological need satisfaction and enjoyment (positive) and boredom (negative). Implications of autonomy-supportive behaviors provided by coaches for the quality of sport involvement among young athletes are discussed.

*Keywords: autonomy support, psychological needs, self-determined motivation, enjoyment / boredom, soccer*

En el marco de la teoría de la autodeterminación (Ryan & Deci, 2000), en este estudio se puso a prueba un modelo en el que se analizaron de forma secuencial las relaciones entre la percepción de apoyo a la autonomía del entrenador, la satisfacción de las necesidades psicológicas, la motivación autodeterminada y la diversión y el aburrimiento; así como el papel mediador hipotetizado de la satisfacción de las necesidades psicológicas y de la motivación autodeterminada. Los resultados del path análisis realizados con una muestra de 370 jóvenes futbolistas varones, ofrecieron apoyo al modelo propuesto. A su vez los análisis de mediación informaron que se producía una mediación total de la satisfacción de las necesidades psicológicas en las relaciones entre el apoyo a la autonomía y la motivación autodeterminada y una mediación parcial de la motivación autodeterminada con respecto a los enlaces entre la satisfacción de las necesidades psicológicas y la diversión (positivo) y aburrimiento (negativo). Se discuten las implicaciones que las conductas de apoyo a la autonomía del entrenador pueden tener para la calidad de la implicación deportiva en los jóvenes deportistas.

*Palabras clave: apoyo a la autonomía, necesidades psicológicas, motivación autodeterminada, diversión/ aburrimiento, fútbol*

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The main reasons for young people to participate in sports are related to the quality of their engagement, that is, with their enjoyment of and interest in the sport (Castillo, Balaguer, & Duda, 2000; Gill, Gross, & Huddleston, 1983), whereas lack of enjoyment is an important determinant of sport drop-out (Gill et al., 1983; Weiss & Petlichkoff, 1989). Moreover, the desire for enjoyment has been positively related to a higher frequency of sports participation (Frederick, 1999). Likewise, there is evidence that athletes who enjoy sports the most are the ones who report being more intrinsically motivated (e.g., Brière, Vallerand, Blais, & Pelletier, 1995; McAuley & Tammen, 1989). The social and personal aspects of sport experience that are positively related to athletes' intrinsic motivation and enjoyment—due to their importance—have been studied from different perspectives, and the self-determination theory is currently one of the most relevant.

The self-determination theory (SDT; Deci & Ryan, 1985; Ryan, 1995; Ryan & Deci, 2000) upholds that the social context surrounding athletes (e.g., the motivational climate created by the coach) can affect their level of intrinsic motivation and enjoyment. Specifically, it has been postulated that the motivational climate created by the coach is related to athletes' motivation via the satisfaction of their basic psychological needs of competence, autonomy, and relatedness (Reinboth, Duda, & Ntoumanis, 2004). It is also stated that the type of motivation experienced by athletes has an impact on their affective states. Ultimately, the motivational climate is assumed to be important for the quality of sport engagement (see Duda, 2001).

Within the SDT framework, the goal of the present work is to explore the relations between athletes' perceptions of coach autonomy support, and their enjoyment/interest and boredom, as well as the mediating role of the satisfaction of the basic psychological needs and self-determined motivation in such interrelationships.

One of the important features of the SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) is that it distinguishes three kinds of motivation: intrinsic motivation, extrinsic motivation, and amotivation, situated along a continuum ranging from high to low self-determination, and which vary according to the degree of behavioral regulation. Thus, intrinsic motivation represents the highest degree of self-determined motivation and occurs in the situations in which persons feel free to commit to activities they find interesting and/or fun and that offer them the chance to learn. Extrinsic motivation, in contrast, takes place when people carry out a task because they value the results associated with it (e.g., public acknowledgement, extrinsic rewards) more than the activity itself. There are four major types of extrinsic motivation, which vary in terms of the level of self-determination inherent in each one. These are, from lower to higher levels of self-determination, external regulation (when the behavior is controlled by external authority, rewards, fear of punishment, coercion, or compliance),

introjected regulation (when behavior is “internally controlled” to avoid guilt or shame, which is best reflected in feelings of “ought” or “should” rather than “want”), identified regulation (when the person acts because the goal is personally important), and integrated regulation (when behavior is completely congruent with other values, goals, and ego needs). Lastly, amotivation refers to the absence of the intention to act and this may be because the person does not feel competent, cannot see the contingencies between the behaviors performed and the expected results, or does not value the activity.

SDT assumes that human beings are born with three basic psychological needs: competence (feelings of confidence and efficacy in action), autonomy (feelings that one is the perceived origin or source of one's action) and relatedness (feelings of being connected to others, feeling affection towards and from others), which are innate, universal, and essential for psychological growth. It also states that, if the social setting promotes satisfaction of these needs, then more self-determined forms of motivation are possible (Ryan & Deci, 2000). Specifically, it considers that self-determined motivation is promoted in social contexts that support individuals' autonomy and will be hindered in contexts that do not. One of the social elements that has been revealed to impact on motivation in the last decades is interpersonal behavior (see Deci & Ryan, 1987). Two interpersonal styles have received the most attention: the controlling style, when significant others act coercively, exerting pressure, in an authoritarian way, and the autonomy support style, in which significant others support freedom and individuals are involved in the decision-making process. According to the cognitive evaluation theory (Deci & Ryan, 1985, 1991), a controlling interpersonal style, like other controlling influences (e.g., deadlines and reinforcements), promotes an external locus of causality, which reduces feelings of autonomy and the corresponding self-determined motivation. However, the autonomy supportive style facilitates a perceived internal locus of causality and thus, increases feelings of autonomy and, consequently, more self-determined ways of regulation are promoted.

SDT indicates that the impact of social factors on behavior regulation does not occur automatically but instead regulation is mediated by perceptions of competence, autonomy, and relatedness. Thus, to the extent that social factors promote satisfaction of the basic psychological needs, self-determined motivation will increase, and vice versa (Deci, Vallerand, Pelletier, & Ryan, 1991).

SDT also considers that self-determined motivation is associated with positive cognitive, emotional, and behavioral consequences for individuals (Deci, 1980). Thus, when considering affective consequences, it can be hypothesized that more self-determined types of motivation will contribute to promote positive affect and decrease negative affective responses.

Incorporating the main points of SDT (Deci & Ryan, 1985, 1991), Vallerand (1997, 2001) proposed a hierarchical model of intrinsic and extrinsic motivation that operates at three levels: global, contextual, and situational. For each level of generality, Vallerand proposed the following sequence: social factors → psychological mediators → types of motivation → consequences.

Some studies in sport context have provided support for the first part of this sequence (autonomy support-psychological needs), using coach autonomy support to operationalize the social factors. Among these studies, research by Gagné, Ryan and Bargmann (2003) analyzed the associations between coach-created environment and basic psychological needs with a sample of female gymnasts from a competition team and reported positive relations between coach autonomy support and perceptions of competence, autonomy, and relatedness.

Other studies have sequentially analyzed the relations between autonomy support, basic psychological needs, and self-determined motivation, using a self-determination index to assess the latter variable. For example, in a study carried out with basketball players, Blanchard and Vallerand (1996, cited in Vallerand & Losier, 1999) found that the more coach autonomy support perceived by the players, the more competent, autonomous, and related to the team they felt, and that such perceptions had positive effects on their self-determined motivation. Along these same lines, Balaguer, Castillo and Duda (2008), in a study of competitive athletes from various sports, reported that the perception of coach autonomy support corresponded to greater satisfaction of the needs of autonomy and relatedness, also observing that the more competent, autonomous, and relatedness the athletes felt, the higher was their self-determined motivation. In another study with a sample of young soccer players, Balaguer, Castillo, Álvarez, and Duda (2005) found that the autonomy support created by the coach was positively related to the satisfaction of each of the three basic psychological needs, and that the perceptions of competence and autonomy were positively related to *self-determined motivation*.

Whereas in the above-mentioned studies (Balaguer et al., 2005; Balaguer et al., 2008; Blanchard & Vallerand, 1996, cited in Vallerand & Losier, 1999), the relations between coach autonomy support and basic psychological needs were determined by systematically analyzing the predictive power of the former on each of the needs, in recent studies carried out in work organizations (Baard, Deci, & Ryan, 2004; Deci et al., 2001), and more recently in the context of physical education (e.g., Ntoumanis, 2005; Standage, Duda, & Ntoumanis, 2005), the needs of autonomy, competence, and relatedness have been combined in a composite variable called *psychological need satisfaction*, as SDT assumes that the three needs coexist (Deci & Ryan, 1985). In the context of physical education, Ntoumanis (2005) supported the assumed predictive relationship of a composite psychological need satisfaction to self-determined motivation.

Regarding the investigations that have examined the implications of motivational regulations on athletes' emotional responses, results have supported positive relationships between the more self-determined motivations (intrinsic and/or identified) and enjoyment of sports (e.g., Brière et al., 1995; McAuley & Tammen, 1989), as well as the existence of negative relationships between the less self-determined types (external regulation and amotivation) and enjoyment (Brière et al., 1995).

In sum, there were two goals in this work: First, to test a model based on the sequence proposed by Vallerand (1997, 2001) at the contextual level of motivation, which was formulated as follows: coach autonomy support → psychological need satisfaction → self-determined motivation → enjoyment / boredom. In this model, it was hypothesized that the perception of the coach autonomy support would be positively related to psychological need satisfaction of the athletes, which, in turn, would be positively related to self-determined motivation, which would be positively related to enjoyment and negatively related to boredom with participation in sports (see Figure 1). This model is the first to use the composite variable of satisfaction of psychological needs applied to the sports context and the study of the interplay between the index of self-determined motivation and enjoyment and boredom.

The second goal of the present work was to study the mechanisms by which: (a) social environment is related to self-determined motivation and (b) psychological need satisfaction is related to affective responses. Specifically, we studied why the characteristics of the autonomy supportive atmosphere created by the coach can act as a potential positive predictor of athletes' self-determined motivation, and why satisfaction of basic psychological needs can affect their enjoyment and boredom. SDT proposes that psychological need satisfaction mediates the link between coach autonomy support and self-determined motivation (Ryan & Deci, 2000) and that self-determined motivation mediates the links between psychological need satisfaction and enjoyment and boredom (Vallerand, 2001).

In previous investigations, the links between coach autonomy support, psychological need satisfaction, and self-determined motivation have been studied with path analysis (e.g., Balaguer et al., 2005; Balaguer et al., 2008; Blanchard & Vallerand, 1996, cited by Vallerand & Losier, 1999), without testing mediation. Going one step further, we examined, on the one hand, the hypothesized mediational effects of psychological need satisfaction between the coach autonomy support and self-determined motivation, and, on the other hand, the mediational effects of self-determined motivation between need satisfaction and enjoyment of (positively) and boredom with (negatively) sports, in both cases using structural equation modeling (SEM) (Holmbeck, 1997). Two highly valued characteristics of the SEM analyses are emphasized: (a) the multiple results of the variables can be simultaneously analyzed and (b) this analytical approach controls measurement errors.

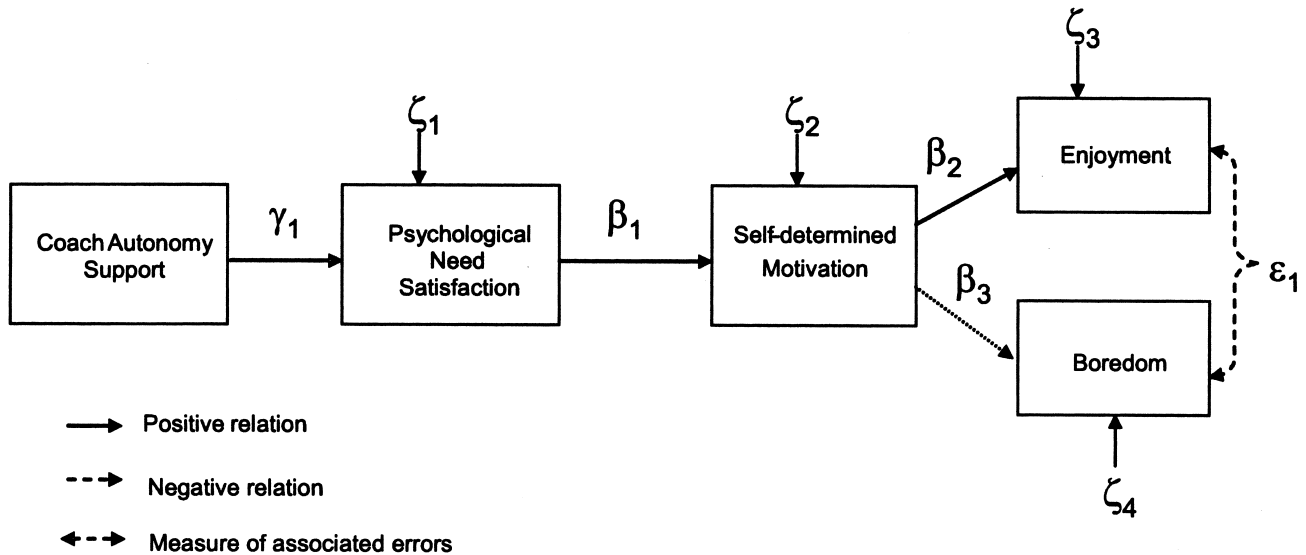


Figure 1. Hypothesized model Social Environment – Needs – Motivation – Affective consequences.

## Method

### Participants

Three hundred and seventy male soccer players from the Federación Valenciana de Fútbol [Valencian Soccer Federation] participated in this study. They belonged to 32 soccer schools of the cadet category, aged between 12 and 16 years old ( $M = 14.77$ ,  $SD = 0.72$ ).

### Instruments

**Sport Climate Questionnaire.** Coach autonomy support was assessed by means of the Spanish version (Balaguer, Castillo, Duda, & Tomás, 2009) of the Sport Climate Questionnaire (SDT Web site: <http://www.psych.rochester.edu/SDT/>). The long version of the scale is made up of 15 items and measures the degree to which athletes perceive that the coach supports their autonomy in sport. Each item starts with the phrase: “On my soccer team...” and the responses are rated on a 7-point Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). An example item of the questionnaire is: “I feel that my coach provides me choices and options” Previous research has confirmed the reliability of this instrument (Balaguer et al., 2008; Reinboth et al., 2004).

**Perceived Competence Scale.** To assess the perception of competence, we used the Spanish version (Balaguer et al., 2008) of the subscale of Perceived Competence from the Intrinsic Motivation Questionnaire (IMI; McAuley, Duncan, & Tammen, 1989), in which we substituted some terms for specific soccer terms so the scale would be more meaningful for soccer players. This 5-item scale assesses individuals’ perceived competence in the sport domain. The

players were requested to indicate their level of agreement with a series of statements such as “I think I’m pretty good at soccer.” The responses are rated on a 7-point Likert scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). Previous research has confirmed the reliability of this instrument (Balaguer et al., 2008; McAuley et al., 1989).

**Perceived Sport Autonomy Scale.** To measure the perception of autonomy, we used the Spanish version (Balaguer et al., 2008) of the 10 items used by Reinboth and Duda (2006) that assess two facets of autonomy: choice /decision-making (6 items) and volitive aspects (4 items) in the sport context. Athletes were requested to indicate how they felt in general when they played soccer, for example: “When I play soccer, I feel that my choices and actions are based on my true interests and values.” (volitive aspect), and “When I play soccer, I feel I can give a lot of inputs to deciding how to practice/training is being carried out” (choice/decision-making facet). The responses are rated on a 7-point Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). Previous research has confirmed the reliability of this instrument (Balaguer et al., 2008; Reinboth & Duda, 2006).

**Perceived Relatedness Scale.** To assess the perception of relatedness we used the Spanish version (Balaguer et al., 2008) of the Acceptance subscale of the Need for Relatedness Scale (NRS; Richer & Vallerand, 1998), adapted for soccer. This 5-item scale assesses the level of relation with others perceived by an individual in the sports domain. Athletes are requested to indicate their personal level of recall about how they feel when they practice their sport, for example: “When I play soccer, I feel supported.” The responses are rated on a 5-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). Previous research has confirmed the reliability of this instrument (Balaguer et al., 2008; Richer & Vallerand, 1998).

*Sport Motivation Scale.* Self-determined motivation was assessed with a Spanish version (Balaguer, Castillo, & Duda, 2003, 2007) of the Sport Motivation Scale (SMS; Pelletier et al., 1995), in which athletes responded to the question: "Why do you practice your sport?" by means of 28 items (divided into 7 subscales made up of 4 items each). Examples of items of each subscale are: "For the excitement I feel when I am really involved in the activity" (Intrinsic Motivation to Experience Stimulation). "For the satisfaction I experience while I am perfecting my abilities" (Intrinsic Motivation toward Accomplishments). "For the pleasure it gives me to know more about the sport that I practice" (Intrinsic Motivation to Know). "Because it is one of the best ways I have chosen to develop other aspects of myself" (Identified Regulation). "Because I must do sports to feel good about myself" (Introjected Regulation). "For the prestige of being an athlete" (External Regulation). And, "I don't know anymore; I have the impression that I am incapable of succeeding in this sport" (Amotivation). The responses are rated on a 7-point Likert scale ranging from 1 (*does not correspond at all*) to 7 (*corresponds exactly*). Previous research has confirmed the reliability of the instrument both with Spanish (Balaguer et al., 2003, 2007; Nuñez, Martín-Albo, Navarro, & González, 2006) and Canadian samples (Pelletier et al., 1995).

*Sport Satisfaction Instrument.* To assess the perception of enjoyment and boredom, we used the Spanish version (Castillo, Balaguer, & Duda, 2002) of the *Sport Satisfaction Instrument* (SSI; Duda & Nicholls, 1992), adapted to soccer, in which we substituted some terms for specific soccer terms so the scale would be more meaningful for soccer players. The instrument has 7 items divided into two scales that measure Enjoyment of Sport Practice (5 items) and Boredom (2 items). In the instructions, the athletes are requested to indicate their degree of agreement with the items that reflect enjoyment criteria (e.g., "I usually enjoy playing soccer.") or boredom criteria (e.g., "When I play soccer, I usually wish the game would end quickly.") Responses are rated on a 5-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). Previous research has confirmed the reliability of this instrument (Duda & Nicholls, 1992; Castillo et al., 2002).

## Procedure

After selecting the teams from the list of the 2<sup>nd</sup> Regional Category of the Valencian Soccer Federation, we sent a letter to the sports directors of the soccer schools, informing them about the goals of the investigation and requesting their collaboration. All the schools contacted expressed interest in participating in the investigation.

The questionnaires were responded anonymously and voluntarily, and were completed by the players at the diverse soccer schools during a 45-minute interval, before beginning their normal training session, in a room made available for this purpose. The questionnaires were administered simultaneously to all the team members who participated in the investigation, and at least one investigator was present. To ensure the players' sincerity, neither the coach nor the sports director of the club was present at any time during the administration of the questionnaires.

## Results

### Preliminary Analyses

To examine the factor structure of the scales used, we carried out confirmatory factor analysis (CFA) with the LISREL 8.54 program (Jöreskog & Sörbom, 2003). For these analyses, we used various goodness-of-fit indexes that included chi-square divided by the degrees of freedom ( $\chi^2/df$ ), the nonnormative fit index (NNFI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). According to Carmines and McIver (1981), a  $\chi^2/df$  quotient lower than 3 indicates a good fit of the model. Values of CFI and NNFI higher than .90 indicate an acceptable fit (Hu & Bentler, 1995). For RMSEA, values between .05 and .10 are considered acceptable, equal to or lower than .08 is optimal (Cole & Maxwell, 1985). The estimated parameters are considered significant when the value associated with the *t*-value is higher than 1.96 ( $p < .05$ ). Lastly, to measure the fit of the models, we examined individual parameters such as standardized residuals, squared multiple correlations, and modification indexes. The results of the different structural models show that all the scales or

Table 1  
*Goodness-of-fit Indexes of the Instruments of the Study*

Latent factors	$\chi^2$	<i>df</i>	RMSEA	CFI	NNFI
Coach autonomy support	212.48	90	.07	.93	.92
Perceived competence	11.36	5	.06	.96	.91
Perceived autonomy	61.20	35	.07	.97	.92
Perceived relatedness	8.89	5	.06	.96	.91
Self-determined motivation	787.87	329	.05	.94	.93
Intrinsic satisfaction	17.01	13	.03	.97	.95



components of the model have satisfactory fit indexes (Table 1), and adequate factor loadings (in order not to extend the length of the article, the results of the CFA are not presented, but are available upon request from the authors).

In Table 2 are presented the descriptive statistics and the internal reliability coefficients (Cronbach's alpha) of the scales used in the study. The mean scores of the players of the sample were higher than the mid point of the scales, except for the variable Boredom. The reliability coefficients of all the scales were satisfactory (between .71 and .90), exceeding the criterion of .70 established for psychological scales (Nunnally, 1978), except for the scale of Introjected Regulation, whose reliability coefficient was marginal ( $\alpha = .62$ ). This scale, as indicated in the next section, was not taken into account in subsequent analyses. The correlation between the two items that make up the Boredom scale was .44.

### Path Analysis

The hypothesized model (see Figure 1) was tested with path analysis, using the maximum likelihood method of the LISREL program 8.54 (Jöreskog & Sörbom, 2003). As with the factor models, the examination of the goodness of fit of the model was done using various indexes (see the subsection of Preliminary Analyses).

Five observable variables were included in the model: (a) coach autonomy support, (b) psychological need satisfaction, (c) self-determined motivation, (d) enjoyment, and (e) boredom. Following the suggestions of other authors (e.g., Baard et al., 2004; Deci et al., 2001; Ntoumanis, 2005; Standage et al., 2005), we used the indicator of psychological need satisfaction, made up of the mean of the scores from the needs of Competence, Autonomy, and Relatedness scales,

because the three variables coexist and share a large percentage of variance. In order to operationalize self-determined motivation, following the example of previous studies (e.g., Balaguer et al., 2008; Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002; Standage, Duda, & Ntoumanis, 2003; Vallerand, Fortier, & Guay, 1997), we computed a self-determination index. This index is obtained by calculating the weight of each type of motivation depending on its position on the self-determination continuum and adding the result. Intrinsic motivation has the highest weight (2), identified regulation has a lower weight (1), external regulation has a negative weight (-1), and amotivation has the most negative weight (-2). Introjected regulation represents the mid point of the self-determination continuum and, therefore, is not considered in the calculus of the self-determination index. High values of this index reflect high self-determined motivation, whereas low values indicate lack of or low self-determined motivation.

The hypothesized model presented an adequate fit to the data. Specifically,  $\chi^2(5) = 17.11$ ,  $p > .01$ ,  $\chi^2/df = 2.56$ , RMSEA = .06, GFI = .98, NFI = .96, and CFI = .97. The parameters of the standardized solution are displayed in Figure 2. The data obtained show that the perception of an autonomy supportive environment positively predicts psychological need satisfaction ( $\beta = .47$ ,  $p < .001$ ). This, in turn, positively predicts self-determined motivation ( $\beta = .29$ ,  $p < .001$ ). Lastly, self-determined motivation acts as a positive predictor of enjoyment ( $\beta = .33$ ,  $p < .001$ ) and a negative predictor of boredom with participation in sports ( $\beta = -.22$ ,  $p < .001$ ). The proposed model accounted for 22% of the variance of basic psychological needs, 8% of the variance of self-determined motivation, 11% of the variance of enjoyment, and 5% of the variance of boredom.

Table 2  
*Descriptive Statistics and Internal Consistency for the Study Variables*

Scales	Range	<i>M</i>	<i>SD</i>	$\alpha$
Coach autonomy support	1-7	4.58	1.12	.89
Perceived competence	1-7	5.28	1.06	.74
Perceived autonomy	1-7	4.69	.97	.79
Perceived relatedness	1-5	3.82	.83	.84
Psychological need satisfaction	1-7	4.60	.74	.85
Motivation to experience stimulation	1-7	5.12	1.13	.70
Motivation toward accomplishments	1-7	5.05	1.16	.77
Motivation to know	1-7	5.10	1.15	.77
Identified regulation	1-7	4.71	1.22	.73
Introjected regulation	1-7	4.73	1.67	.62
External regulation	1-7	4.43	1.28	.71
Amotivation	1-7	3.62	1.51	.72
Self-determined motivation	-5.75-15.75	3.21	4.14	.88
Enjoyment	1-5	4.39	.60	.73
Boredom	1-5	1.64	.86	.44*

Note. \* Pearson correlation is reported, as this construct was assessed by two items.

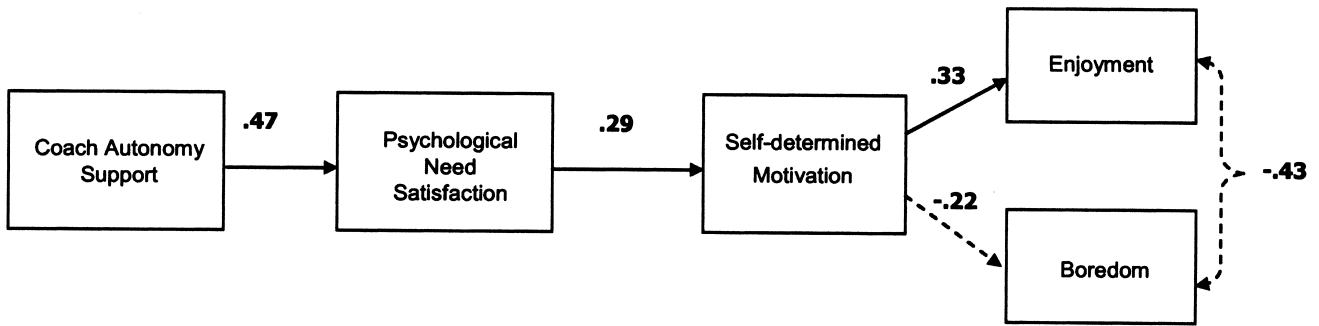


Figure 2. Structural Model Social Environment – Needs – Motivation – Affective consequences.

Note. All coefficients are standardized and significant ( $z > 1.96$ ).

### Analysis of Mediation

Following the recommendations of Holmbeck (1997), we tested a series of alternative models in order to assess the effect of the two mediations studied: (a) whether psychological need satisfaction mediated the effect of coach autonomy support on self-determined motivation and (b) whether self-determined motivation mediated the effect of psychological need satisfaction on enjoyment and boredom.

According to Holmbeck (1997), for a variable (B) to mediate a relation between (A) and (C), three conditions must be met: (a) The direct relation between (A) and (C) must be significant and there must be an adequate fit to the data. (b) The direct relation between (A) and (B) and between (B) and (C) must be significant and there must be an adequate fit to the data. This is called a restricted model. (c) A third unrestricted model must be tested, where (A) is directly related to (C) and indirectly related to (C) via (B).

The last step was to interpret the effect of the mediation comparing the chi-square of the restricted model with that of the unrestricted model using the chi-square difference test. If there are no significant differences between the unrestricted and the restricted model, the mediation is considered total. In other words, the direct relation between (A) and (C) ceases to be significant when the mediating variable (B) is taken into account. Whereas if there are differences between the unrestricted and the restricted model, the hypothesis of total mediation is rejected and more in-depth analysis must be performed to determine whether partial mediation can be considered. Partial mediation is considered if, taking into account the mediating effect of (B), the direct effect of (A) on (C) decreases without ceasing to be significant. It is also useful to report and compare the (A) on (C) path coefficients for when (B) is, versus when (B) is not, included in the model. Lastly, a complementary analysis was conducted to determine the significance of the mediation by means of the Sobel test.

*Mediation of psychological need satisfaction.* With regard to the first step indicated by Holmbeck (1997), we calculated

a model in which we hypothesized two direct relations, one between the coach autonomy support and self-determined motivation, and the other between self-determined motivation and enjoyment and boredom. The fit to the data was adequate,  $\chi^2(2) = 3.60$ ,  $p > .01$ , RMSEA = .06, GFI = .98, NFI = .93, and CFI = .94. In this model, the path coefficients between coach autonomy support and self-determined motivation and between self-determined motivation and enjoyment were positive and significant ( $\beta = .25$  and  $\beta = .33$ , respectively,  $p < .001$  in both cases), whereas the coefficient between self-determined motivation and boredom was negative and significant ( $\beta = -.22$ ,  $p < .001$ ). The second step consisted of examining the restricted model whose parameters are displayed in Figure 1. The results of this model, as seen in the subsection of Path Analysis (see Figure 2), show an adequate fit to the data and the coefficients were in the expected direction. In the third and last step, we analyzed an unrestricted model, which is a replica of the model analyzed in the second step, but added a direct path between coach autonomy support and self-determined motivation. This third model presented adequate fit to the data,  $\chi^2(4) = 13.75$ ,  $p > .01$ , RMSEA = .05, GFI = .98, NFI = .96, and CFI = .97. The direct path coefficient between coach autonomy support and self-determined motivation was nonsignificant ( $\beta = .01$ ,  $p > .001$ ), with the remaining path coefficients maintaining the same values as in the restricted model. The analysis of the chi-square difference showed that the second and third models are similar,  $D\chi^2(1) = 3.36$ ,  $p > .05$ . These results indicate that the direct path between coach autonomy support and athletes' self-determined motivation do not contribute significant improvement to the fit with regard to the indirect model in which this relationship was restricted (see Figure 2), thereby supporting the total mediation of psychological need satisfaction between coach autonomy support and athletes' self-determined motivation. Likewise, the Sobel's test indicated that the observed mediating effect of coach autonomy support on athletes' self-determined motivation via satisfaction of psychological needs was significant ( $z = 3.41$ ,  $p < .01$ ).



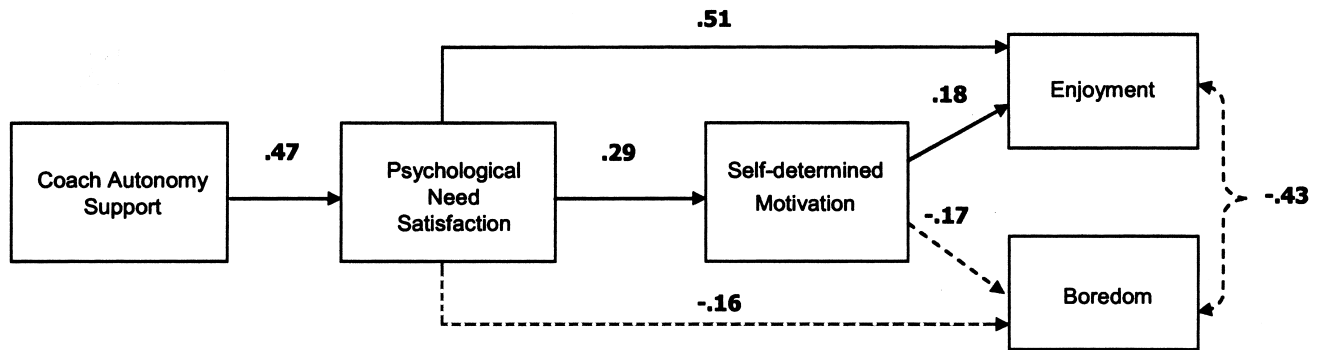


Figure 3. Reformulated structural model Social Environment – Needs – Motivation – Affective consequences.

Note. All coefficients are standardized and significant ( $z > 1.96$ ).

*Mediation of self-determined motivation.* Still following the recommendations of Holmbeck (1997), we explored whether self-determined motivation mediated the effect of psychological need satisfaction on enjoyment and boredom. In the first model, we tested the direct relations between coach autonomy support and psychological need satisfaction, and between such satisfaction and enjoyment and boredom. The fit to the data was adequate,  $\chi^2(2) = 1.19$ ,  $p > .01$ , RMSEA = .00, GFI = 1.00, NFI = 1.00, and CFI = 1.00. In this model, the path coefficients between coach autonomy support and psychological need satisfaction and between such satisfaction and enjoyment were positive and significant ( $\beta = .47$  and  $\beta = .56$ , respectively,  $p < .001$  in both cases), whereas the coefficient between psychological need satisfaction and boredom was negative and significant ( $\beta = -.21$ ;  $p < .001$ ). The second step consisted of examining the restricted model whose parameters are displayed in Figure 1. The results of this model, as seen in the Path Analysis subsection show an adequate fit to the data and the relation coefficients were in the expected direction (see Figure 2). In the third and last step, we analyzed an unrestricted model, which is a replica of the model analyzed in the second step, but adding a direct path between psychological need satisfaction and enjoyment and between such satisfaction and boredom. This third model presented adequate fit to the data,  $\chi^2(3) = 7.95$ ,  $p > .01$ , RMSEA = .03, GFI = .98, NFI = .96, and CFI = .99. In this model (see Figure 3), the direct relationship between psychological need satisfaction and enjoyment was significant ( $\beta = .51$ ,  $p < .001$ ), as was the path between such satisfaction and boredom, although it was negative in this case ( $\beta = -.16$ ,  $p < .001$ ). The path coefficients between self-determined motivation and enjoyment, and between such motivation and boredom were also significant ( $\beta = .18$  and  $\beta = -.17$ , respectively,  $p < .001$ ). The chi-square difference analysis showed that the restricted and unrestricted models are different,  $\Delta\chi^2(2) = 9.16$ ,  $p > .05$ . These results indicated that the direct relations between psychological need satisfaction and enjoyment and between such satisfaction and boredom contribute a significant improvement to the fit in comparison to the

indirect model in which these relationships were restricted (see Figure 2), so the hypothesis of total mediation was rejected. A more detailed analysis of the beta coefficients led us to support partial mediation because, although the direct relation coefficients between psychological need satisfaction and enjoyment and between such satisfaction and boredom were still significant when mediated by the effect of self-determined motivation, these coefficients were lower than those observed when self-determined motivation did not mediate between psychological need satisfaction and enjoyment ( $\beta$  dropped from .56 to .51,  $p < .001$ ), and between satisfaction of psychological needs and boredom ( $\beta$  dropped from .21 to  $-.16$ ,  $p < .001$ ). The Sobel test indicated that the observed mediating effect of psychological need satisfaction on athletes' enjoyment and boredom via self-determined motivation was significant ( $z = 3.55$  and  $-3.28$ , respectively,  $p < .01$ ).

Summing up, the mediational analyses confirmed the hypothesized effects of the mediating variables of the hypothesized model in the present study. Specifically, psychological need satisfaction totally mediated the effect of coach autonomy support on athletes' self-determined motivation, whereas self-determined motivation partially mediated the effect of psychological need satisfaction on athletes' enjoyment or boredom. That is, psychological need satisfaction is both directly and indirectly—through self-determined motivation—related to athletes reported enjoyment and boredom. The reformulated model (see Figure 3) accounted for 22% of the variance of basic psychological needs, 8% of the variance of self-determined motivation, 34% of the variance of enjoyment, and 7% of the variance of boredom.

## Discussion and Conclusions

Within the framework of the self-determination theory (SDT; Ryan & Deci, 2000), the goal of the present investigation, carried out with a sample of young soccer players, was two-fold. First, we tested a motivational model

that proffered that the perception of autonomy support provided by the coach would promote players' satisfaction of psychological needs and self-determined motivation, with the latter variable holding positive implications for players' enjoyment and negative consequences for boredom. Second, we examined the hypothesized mediating role of psychological need satisfaction and self-determined motivation in the model.

According to the SDT (Deci & Ryan, 1985, 1991; Ryan & Deci, 2000, 2002), the results obtained showed that the degree to which the players perceive that their coach supports their autonomy is positively related to their psychological need satisfaction. These results are similar to those of other studies carried out in the sport context in which coach autonomy support was found to positively relate to each of the basic psychological needs of competence, autonomy, and relatedness (e.g., Balaguer et al., 2005; Blanchard & Vallerand, 1996, cited in Vallerand & Losier, 1999; Gagné et al., 2003). Therefore, independently of whether the interrelations between coach autonomy support and satisfaction of basic psychological needs are studied separately or using the mean of the latter (psychological need satisfaction) as in the present study, the results underline the importance of the atmosphere created by authority figures, such as coaches, in satisfaction of players' basic psychological needs. Specifically, the central concept of this sequence indicates that when the coach takes on the athletes' viewpoint and offers them choice, takes into account their feelings, explains to them why he demands certain behaviors, athletes feel more competent in their sport, more autonomous in their actions, and better related to significant others from their environment.

Regarding the second part of the sequence of the proposed model, and in accordance with our hypothesis, the results suggest that psychological need satisfaction provides the essential ingredient for self-determined motivation, because when young soccer players perceive that their psychological needs are satisfied, they report a higher degree of self-determined motivation. Whereas, to date, the study of the relationships between need satisfaction and self-determined motivation found support in the sport context by analyzing psychological needs independently and using different samples of athletes of different ages (e.g., Balaguer et al., 2008; Blanchard & Vallerand, 1996, cited in Vallerand & Losier, 1999), the results of the present study also support this theoretical premise but this time, through a composite measure set of psychological need satisfaction.

The last part of the sequence studied, in which we assumed that self-determined motivation would promote affective consequences and, as a result, also improve the quality of the young soccer players' involvement, was supported. When the players reported higher self-determined motivation, they also perceived more enjoyment and less boredom in their sport participation. These results are in accordance with those of other investigations in which it was found that the more self-regulated types of motivation, such as intrinsic motivation

and/or identified regulation, act as positive predictors of enjoyment (e.g., Brière et al., 1995). The present findings also provide information about the interplay between self-determined motivation and boredom, a variable about which little was known in this context. Moreover, they add empirical evidence to the study of the relations between self-determination and affective states by means of considering variability in players' degree of the self-determination.

Thus, in general, the results of the model underscore the importance of the creation of motivational autonomy supportive atmospheres that favor satisfaction of psychological needs and more self-determined types of motivation in players. This type of environment, and corresponding motivation – related processes facilitates the development of positive affective states, such as enjoyment, thereby improving the quality of sports participation. However, as the present study is cross-sectional, we can only comment on the relationship between the variables studied, without suggesting causal directions. Longitudinal studies are needed in this field to be able to speak with authority about the possible applied implications of this model in the sport context.

### *The Mediation Role of Psychological Need Satisfaction*

The second goal of the present work was to study the mechanisms by which the environmental factors could affect self-determined motivation and the affective consequences.

In the first mediation tested between coach autonomy support and self-determined motivation through global need satisfaction, we found a significant total mediation. This has important implications for coaches' effectiveness in the development of the players' motivation. It indicates that the climate created by the coach promotes self-determined motivation via the psychological need satisfaction. In other words, the way to develop self-determined motivation is to get the players to be autonomous, develop their competence, and perceive themselves as being supported and respected by the people who surround them within the sport context.

In the second mediation studied between psychological need satisfaction and enjoyment or boredom through self-determined motivation, we found evidence of a partial mediation. This leads us to interpret that the mechanisms influencing players' emotional responses are the satisfaction of the needs of autonomy, competence, and relatedness, and the degree of self-determined motivation manifested.

To conclude, the present study suggests that coaches play a very important role promoting or hindering the quality of the young players engagement through the strategies used in their training sessions and during the games (see Balaguer, 2007). When coaches create climates in which control is minimized, attempts are made to understand the players' viewpoint, and various alternatives are offered to players, they are thereby contributing to players' enjoyment of sports

participation and preventing them from becoming bored with practice. All this occurs through the development of their competence, autonomy, and good social relationship, so they experience their participation in a more self-determined way with the subsequent emotional benefits. In other words, coach autonomy support has important implications for self-determined motivation, via psychological need satisfaction, and also for young athletes' enjoyment and quality of enjoyment in sport.

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