

## The mediating role of sport self-motivation between basic psychological needs satisfaction and athlete engagement

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### Abstract

**Background:** Engagement could constitute a frame of reference for promoting positive experiences in sport, hence the importance of learning about what precedes it in order to promote its development. This study was conducted to examine the role of self-motivation as a mediator between basic psychological needs satisfaction and athlete engagement. **Method:** A sample of 426 male and female athletes from different sports were asked to complete three questionnaires measuring each of the study variables: The Basic Needs Satisfaction in Sport Scale, the Behavioral Regulation in Sport Questionnaire and the Athlete Engagement Questionnaire. A structural relationships model between the constructs analyzed was specified and implemented. **Results:** High levels of self-motivation increased levels of athlete engagement and vice versa. **Conclusion:** Basic psychological needs satisfaction has a direct positive effect on athlete engagement and in turn, an indirect effect mediated by athletes' self-motivation.

**Keywords:** motivation, basic psychological needs, engagement, sport.

### Resumen

**El rol mediador de la motivación autodeterminada entre la satisfacción de las necesidades psicológicas básicas y el engagement deportivo.**

**Antecedentes:** el *engagement* es un marco de referencia para la promoción de experiencias positivas en el deporte, de ahí la importancia de conocer sus antecedentes con el objetivo de promover su desarrollo. El presente estudio se realizó con el propósito de examinar el papel de la motivación autodeterminada como mediadora entre la satisfacción de las necesidades psicológicas básicas y el *engagement* de los deportistas. **Método:** se utilizó una muestra de 426 deportistas, hombres y mujeres, de diferentes modalidades deportivas a los que les pidió que respondieran a tres cuestionarios que medían cada una de las variables de estudio: *Basic Needs Satisfaction in Sport Scale*, *Behavioral Regulation in Sport Questionnaire* y *Athlete Engagement Questionnaire*. Se especificó un modelo de relaciones estructurales entre los constructos analizados. **Resultados:** niveles altos de motivación autodeterminada incrementan los niveles de *engagement* del deportista mientras que niveles bajos de motivación autodeterminada los debilitan. **Conclusión:** existe un efecto directo de tipo positivo de la satisfacción de las necesidades psicológicas básicas de los deportistas sobre su grado de *engagement* deportivo y a la vez un efecto indirecto mediado por su motivación autodeterminada.

**Palabras clave:** motivación, necesidades psicológicas básicas, *engagement*, deporte.

Self-Determination Theory (SDT) establishes six types of self-regulation which are, in descending order of self-determination: intrinsic motivation, integrated regulation, identified regulation, introjected regulation, extrinsic motivation, and amotivation (Deci & Ryan, 2000), with the more self-regulated levels being achieved for reasons intrinsic to each subject (Sevil, Abós, Generelo, Aibar, & García-González, 2016). It is a very useful framework in the context of sport as it provides a better understanding of participants' motivational, cognitive, and affective processes (Méndez-Giménez, Fernández-Río, & Cecchini, 2012).

The SDT is comprised of several subtheories, including the theory of Basic Psychological Needs (Deci & Ryan, 2000) which concludes that people need to feel autonomous (the experience of freedom in one's actions), competent (the belief of achieving valued outcomes on the environment) and related to others (the desire to feel connected to others). Autonomy in turn encompasses three qualities (Reeve, Nix, & Hamm, 2003). The perceived locus of causality, understood as a bipolar continuum extending from internal to external, reflects the belief that actions undertaken are initiated and regulated by personal preferences (internal) or the environment (external); volition, which focuses on how people feel when doing what they do and do not want to do; and choice, understood to be the individual's capacity to make choices in flexible or restrictive settings.

In the literature, basic psychological needs satisfaction has been associated with the more self-regulated degrees of motivation (Gené & Latinjak, 2014). In fact, basic psychological needs positively predicted the more self-determined regulations

(intrinsic motivation, integrated regulation, and identified regulation) in adolescents (Méndez-Giménez et al., 2012; Moreno-Murcia, Marzo, Martínez-Galindo, & Conte, 2011) and practitioners of crossfit (Davies, Coleman, & Babkes-Stellino, 2016). Subjects are also known to demonstrate greater intrinsic motivation if these needs are satisfied (Méndez-Giménez et al., 2012). These findings are complemented by studies which attest to the fact that the basic psychological needs have a negative impact on the less self-determined regulations. Specifically, the need for competence correlated negatively with amotivation and the need for relatedness with introjected regulation, external regulation and amotivation (Moreno-Murcia et al., 2011).

SDT tries to explain what motivates people to participate in a given sport, plus the implications this may have for engagement, among other constructs (Fenton, Duda, & Barrett, 2016; Fernández-Río, Cecchini, Méndez-Giménez, Terrados, & García, 2018; Ullrich-French, González-Hernández, & Hidalgo, 2017). This is an important parameter to consider in sport because of the benefits it can bring about in the athlete's performance and wellbeing, and in terms of a positive sporting environment (Arce, De Francisco, Andrade, Seoane, & Raedeke, 2012; Lonsdale, Hodge, & Raedeke, 2007). The literature suggests that engagement and basic psychological needs satisfaction could be important variables to increase sport practice by understanding the mediating role of self-motivation.

Engagement in sport is defined as a multidimensional construct consisting of four interrelated dimensions: vigor, confidence, dedication, and enthusiasm. Vigor, characterized by high energy levels, translates into effort and the ability to prevail in the face of adversity; confidence is understood as the capacity to perform at a high level and achieve outcomes; dedication is characterized by a sense of meaning, pride, and challenge; and enthusiasm, which occurs when the task produces a pleasant state of personal satisfaction, is characterized by concentration, efficiency, and immersion in the task at hand (Lonsdale, Hodge, & Jackson, 2007; Lonsdale, Hodge, & Raedeke, 2007).

Throughout life, adults can experience different motivational regulations to remain physically active or participate in different sports. On the other hand, it is important to increase young people's participation in sports to reduce levels of overweight and obesity in the general population (Kornides et al., 2018). To achieve higher levels of commitment to engaging in youth sport, it is important to identify potential determinants for sports participation (Collings et al., 2014). Athlete engagement has not received much attention within the framework of SDT, even though it can explain why a person is motivated to take part in sport and their dedication to physical activity (Fenton et al., 2016).

Based on SDT, the aim of this study is to analyze the relationship between basic psychological needs and engagement by describing the mediating role of self-motivation. The study puts forward the following hypotheses: 1) basic psychological needs satisfaction has a direct (positive) effect on engagement and an indirect effect mediated by self-motivation; 2) for the higher levels of self-motivation, the indirect effect will be positive in terms of both the effect of basic psychological needs on motivation and that of motivation on engagement; and 3) conversely, for the lower levels of self-motivation, the indirect effect will be negative with regards to both the effect of basic psychological needs on motivation and that of motivation on engagement. That is, basic psychological needs satisfaction is negatively associated with lower levels of self-motivation, which undermine engagement.

## Method

### Participants

The sample, selected using purposive sampling, contained 426 Spanish athletes from multiple sports, predominantly team sports (basketball, 17.6%; soccer, 17.4%; indoor football, 15%; handball, 11%; rugby, 8.2%; volleyball, 7.5%; synchronized swimming, 1.2%; rowing and water polo, .9% each other, and hockey, .7%). The study population was 50.7% male and 49.3% female, and their ages ranged between 13 and 28 years ( $M = 17.89$ ;  $SD = 3.583$ ). They completed between 1 and 6 training sessions each week ( $M = 3.19$ ;  $SD = 1.004$ ), each session lasting an average of 101.80 minutes ( $SD = 35.540$ ), and for approximately 9 months per year ( $M = 9.73$ ;  $SD = 1.310$ ).

### Instruments

Participants were given three questionnaires to measure the three psychological constructs forming the focus of this study, as well as a series of initial questions to gather personal and sports data such as age, gender, sport practiced, number of weekly training sessions, length of sessions, and months of training per year.

The Basic Needs Satisfaction in Sport Scale (BNSSS; Ng, Lonsdale, & Hodge, 2011). The study employed the 20-item Spanish version (De Francisco, Parra, Arce, & Vilchez, 2018), which measures the five basic psychological needs proposed in the original BNSSS by Ng et al. (2011): competence (5 items), autonomy-choice (4 items), autonomy-volition (3 items), autonomy-internal perceived locus of causality (IPLOC; 3 items), and relatedness (5 items). The questionnaire used a Likert-type scale with options ranging from 1 "Not true at all" to 7 "Very true". In this study, values of Cronbach's alpha were above a threshold of .70, except autonomy-volition (.689).

The Behavioral Regulation in Sport Questionnaire (BRSQ; Lonsdale, Hodge, & Rose, 2008). The Spanish version by Viladrich, Torregrosa, and Cruz (2011) was used, featuring 24 items evenly distributed over six subscales: amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation. Again, a Likert-type scale response was followed with options from 1 "Completely false" to 7 "Completely true". In the present study, the three most self-determined levels of motivation (intrinsic motivation, integrated regulation, and identified regulation) were considered high self-motivation, while the three least self-determined levels (introjected regulation, extrinsic motivation, and amotivation) were considered as low self-motivation. Alpha of Cronbach's of low self-motivation and high self-motivation in this research reached values of .899 and .894, respectively.

The Athlete Engagement Questionnaire (AEQ; Lonsdale, Hodge, & Jackson, 2007). The Spanish version of the AEQ was used (De Francisco, Arce, & Graña, 2017), which contains 16 items designed to measure the four dimensions or components of athletic engagement proposed by Lonsdale et al. (2007): confidence, vigor, dedication, and enthusiasm. Each dimension was measured by means of four items using a 5-point Likert-type format, with responses from 1 "Almost never" to 5 "Almost always". The values of internal reliability for each dimension in this work were greater than .70.

Procedure

Having obtained approval from the Ethics Committee of University Catholic of Murcia, data collection was started by contacting participating clubs and/or athletes. After explaining the purpose of the study, various appointments were scheduled to complete the questionnaire booklet. A standardized procedure was used to ensure all participants received the same instructions. The athletes (or their sporting tutors if they were minors) signed a declaration to collaborate in the study before filling out the booklet.

Data analysis

A preliminary analysis of the data was carried out in order to detect and eliminate missing or out of range data. The found missing data were eliminated so the initial sample of 438 was reduced to 426.

The descriptive statistics (mean and standard deviation, *M* and *SD*) and Pearson correlation coefficients between study variables were initially calculated using IBM SPSS Statistics, version 20, and the structural relationships were then analyzed from the perspective of the SEM (Structural Equation Modeling) with the aid of IBM SPSS Amos Graphics, version 22 (Arbuckle, 2013). The model was specified by taking the basic psychological needs satisfaction measured using the BNSSS as an exogenous variable (one factor, with five indicators), the self-determined motivation measured via the BRSQ as a mediator variable (two observed variables: low [introjected regulation, extrinsic motivation, and amotivation] and high self-motivation [intrinsic motivation, integrated regulation, and identified regulation]), and the engagement measured by means of the AEQ as an endogenous variable (one factor, with four indicators).

For the evaluation of the global fit of the model, the following indexes were selected: the ratio between  $\chi^2$  statistic and their degrees of freedom, the goodness of fit index (GFI), the comparative fit index (CFI), the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR). Traditionally, an acceptable fit is considered if the values are between 0 and 3 for ratio  $\chi^2$  and their degrees of freedom, greater than .90 for CFI and GFI (higher than .95 indicate an optimal fit), smaller than .08 for the RMSEA and SRMR (lesser than .06 are good fit). Hu and Bentler (1999) suggested using a

combination of one of the relative adjustment indexes with the SRMR or the RMSEA.

Results

Descriptive statistics and correlations

Table 1 shows the mean and standard deviation for each of the study factors. This table also demonstrates that nearly all Pearson correlations between factors produced statistically significant values apart from the relationship between values for low self-motivation and satisfaction of competence, autonomy-choice, and relatedness. There was a prevalence for positive values, except for in the relationships involving low self-motivation. Finally, the main diagonal of the matrix in Table 1 contains Cronbach's alpha coefficients for each of the factors studied.

SEM model

The initial model contained 66 sample moments, 25 over-identified parameters to estimate and 41 degrees of freedom. Maximum likelihood was used to estimate the parameters and bootstrap to calculate their standard errors, given that the multivariate kurtosis coefficient was 45.338 ( $Z = 27.666; p < .001$ ). The quotient between  $\chi^2$  (350.421;  $p < .001$ ) and its degrees of freedom (41) was 8.456. The remaining fit indexes were GFI= .86, CFI= .86, RMSEA= .13 (90% CI: .12-.15), and SRMR= .07.

In order to achieve a better overall fit to the data, the model was re-specified by adding correlations between measurement errors of autonomy-choice (e2) and autonomy-volition (e4); autonomy-volition (e4) and relatedness (e5); and confidence (e6) and dedication (e8) were allowed to improve the initial fit of the model. With these specifications it assumed that these pairs of dimensions are related by the shared influence in the latent variable to which they belong (in the first two cases by satisfaction of basic psychological needs, and in the latter, by athlete engagement) but also, a part of covariation is due to other sources besides the common factor.

Figure 1 depicts the final model displayed for this study. It contains 66 different sampling moments, 28 parameters to estimate, and 38 degrees of freedom. Indicators for the model's overall fit were:  $\chi^2_{(38)} = 241.206 (p < .001)$ ,  $\chi^2/gf = 6.348$ , GFI = .91, CFI = .91, RMSEA = .11 (90% CI, .10-.13) and SRMR = .06. All

Table 1  
Descriptive statistics and Pearson correlation matrix for basic needs, self-motivation and engagement

	M (SD)	1	2	3	4	5	6	7	8	9	10	11
1. Competence	5.565 (1.072)	.889										
2. Autonomy_choice	4.912 (1.295)	.519**	.812									
3. Autonomy_volition	5.709 (1.046)	.347**	.269**	.689								
4. Autonomy_IPLOC	5.739 (1.116)	.692**	.514**	.420**	.765							
5. Relatedness	6.057 (.951)	.558**	.450**	.318**	.541**	.831						
6. Low self motivation	2.100 (1.153)	-.064	.002	-.290**	-.185**	-.134	.899					
7. High self motivation	3.987 (.585)	.539**	.432**	.429**	.621**	.495**	-.131**	.894				
8. Confidence	3.690 (.838)	.525**	.282**	.101*	.363**	.124**	-.062*	.282**	.827			
9. Vigor	4.228 (.667)	.291**	.227**	.252**	.417**	.194**	-.196**	.393**	.473**	.805		
10. Dedication	4.113 (.795)	.400**	.206**	.228**	.424**	.136**	-.160**	.384**	.682**	.639**	.853	
11. Enthusiasm	4.552 (.590)	.331**	.268**	.374**	.506**	.208**	-.310**	.538**	.444**	.688**	.635**	.800

Note: \*  $p < .05$ ; \*\*  $p < .01$ ; Cronbach's alpha in diagonal matrix

parameters were statistically significant ( $p < .01$ ). The factor loadings of satisfaction of basic psychological needs ranged from .53 to .88. Factor loadings of athlete engagement from .54 to .88. Factor loadings, variances of the errors ( $e_1, e_2$ , etc.), the residuals ( $d_1$ ), and the direct, indirect, and total effects, were in the expected direction according to the hypothesis.

In line with hypothesis 1, basic psychological needs satisfaction had a direct positive effect on engagement of .29 ( $p < .001$ ) and an indirect effect mediated by (high and low) self-motivation of .2679 ( $p < .001$ ). The total effect (direct + indirect effects) was .5579 ( $p < .001$ ), and the proportion of variance of engagement explained by the model was .41.

In accordance with hypothesis 2, both the effect of basic psychological needs satisfaction on the higher levels of self-motivation and that of self-motivation on engagement were positive (.71 and .33, respectively, with  $p < .001$  in both cases). Whereas on the contrary, as predicted by hypothesis 3, both the effect of basic psychological needs satisfaction on the lower levels of self-motivation and that of self-motivation on engagement were negative, with values of -.16 ( $p < .01$ ) and -.21 ( $p < .001$ ), respectively.

### Discussion

The aim of the present work was to study the relationship between basic psychological needs and engagement, taking motivation as a mediator variable. The results confirmed the hypotheses put forward, wherein basic needs satisfaction presents a positive relationship with the most self-determined types of motivation and a negative association with least self-determined ones; therefore, motivation exercises a mediating role between needs satisfaction and engagement. However, it is necessary to interpret these statements with caution due to the values of overall fit of the model, where not all the indexes showed a good fit.

Gené and Latinjak (2014) observed a positive and significant relationship between basic psychological needs and intrinsic motivation, and a negative relationship between the former and amotivation in elite Spanish athletes. In their work they upheld the six levels of motivation by analyzing the effect of each need on each level. They found that the degree of satisfaction of the three basic psychological needs positively and significantly correlated to the more autonomous types of regulation (except for the need for autonomy with identified regulation, which was not significant), and the level of satisfaction of the basic psychological

needs relatedness and autonomy was negatively and significantly associated with less self-determined types of regulation, but they did not observe any relation between competence need satisfaction and the less self-determined regulations. Méndez-Giménez et al. (2012) evidenced similar results in Spanish physical education students, although their research revealed that only the need for competence had a significant correlation with all levels of motivation, whereas the relatedness need presented significant relationships with intrinsic motivation (the most self-determined level of motivation) and identified regulation, and the need for autonomy was associated with just intrinsic motivation. In the present study, by simplifying needs satisfaction through an overall latent variable and presenting dichotomized levels of motivation, it is evident that the needs satisfaction holds a positive relationship with the more self-determined levels and a negative one with the less self-determined ones. Therefore, needs satisfaction is explained by a high percentage of more self-determined types of motivation (50%) and a low percentage of less self-determined types (2%). These results coincide with those of Davies et al. (2016) who analyzed the role of basic psychological needs satisfaction with respect to the regulations that form high and low levels of self-motivation. Satisfaction of the needs explained 38.8% of the variance in the more self-determined types of motivation and 5.7% in the less self-determined types of motivation.

What is more, a positive relationship between basic psychological needs satisfaction and engagement has also been observed through the application of structural equation models such as those used in this study. Jowett, Hill, Hal and Curran (2016) recorded a standardized coefficient of .71 for basic psychological needs in relation to engagement in young English athletes. Other studies into Spanish male football players (Martínez-Alvarado, Guillén, & Feltz, 2016) and Canadian athletes (Hodge, Lonsdale, & Jackson, 2009) confirmed the predictive value of satisfaction in each basic psychological need over athlete engagement. In both cases, the need for autonomy presented a high predictive value for engagement, while competence was also relevant in the study by Hodge et al. (2009) where competence and autonomy equaled 30% of the explained variance of engagement.

Research into athlete engagement is limited (Podlog et al., 2015); therefore, nor has the relationship between engagement and motivation been studied in detail, despite the benefits both variables can contribute to athletes, such as perseverance to continually take part in the sporting activity or the associated emotional wellbeing

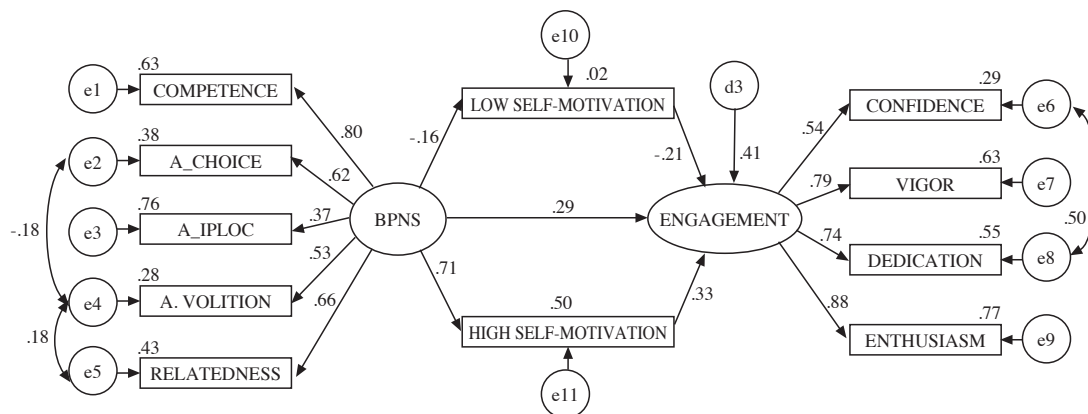


Figure 1. Structural model relating basic psychological needs satisfaction (BPNS), self-motivation, and engagement

(Martins, Rosado, Ferreira, & Biscaia, 2017). In a sporting context, only the study by Podlog et al. (2015) includes the three variables measured in our work, in other words, basic psychological needs satisfaction, engagement, and motivation. However, they studied the effect of each psychological need (autonomy, competence, and relatedness) independently, establishing four levels of motivation as mediators of engagement: intrinsic motivation, identified regulation, external motivation, and amotivation. The explained percentage corrected for each model according to the need ranged between 36% and 44%, but they did not offer a total percentage of variance for needs satisfaction with respect to engagement (41% in this study). Furthermore, not all levels of motivation had an effect on engagement (external motivation did not have a significant effect on needs for relatedness and competence).

Although engagement plays an important role in improving people's motivation (Salanova, Schaufeli, Llorens, Peiró, & Grau, 2000), the relationship between the two variables in a sporting context has not been studied in depth, while the motivation-mediated relationship between basic psychological needs and engagement has received even less attention. It would be of considerable interest, therefore, to continue studying these three variables in an athletic setting. It would also prove interesting to broaden the study sample. The professional performance of the coaches has a decisive effect on the athletes, promoting or impeding their engagement in sport (Fenton et al., 2016). Excessive control from the sports coach positively predicts frustration of the three psychological needs in athletes (Balaguer, Castillo, & Duda, 2008), whereas a positive correlation has been observed between coaching style, basic psychological needs, self-motivation, and athlete engagement (Murillo et al., 2018).

In addition, given some limitations that can be observed in this study, future research could be proposed in order to improve it. The data have been collected through questionnaires, so that the

reliability of the measurement instruments is limited. The sample was collected through a non-probabilistic sampling, affecting the generalization of the results, as well as the cross nature of the study, not experimental and descriptive, impeding contrasting causal hypotheses.

Promoting engagement in sport offers a basic tool for understanding an individual's motivation and commitment towards physical activity (Fenton et al., 2016). Encouraging athletes to make their own decisions, participate in their assessment, and express their feelings would improve engagement in young athletes (Jowett et al., 2016; Martínez-Alvarado et al., 2016), so better understanding of the antecedents for engagement could help sports coaches cultivate the conditions under which engagement can develop (Podlog et al., 2015).

This study shows the importance of basic needs satisfaction and engagement in the mediation of the motivation of the athlete. In terms of sports, an athlete with high basic needs satisfaction and engagement will have a higher self-determined motivation. This could also highlight the importance of psychological variables in predicting sporting success. For example, Fernández-Río et al. (2018) showed, in a case study, that high performance athletes (Olympic level) may have low extrinsic motivational regulations. In this line, Balaguer, Castillo, Duda, and García-Merita (2011) associated these lower extrinsic regulations with an indicator of well-being. Therefore, at all levels of sports practice, whether regional or even very high performance, it is interesting to know these psychological variables that mediate motivation to make it as intrinsic as possible.

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