



Associations Between Self-Determined Motivation, Team Potency, and Self-Talk in Team Sports

by

Diana Amado¹, Miryam Maestre², Carlos Montero-Carretero³,
Pedro Antonio Sánchez-Miguel⁴, Eduardo Cervelló³

The current study aimed to evaluate the determinant factors of athletes' internal positive self-talk that might lead to decreased anxiety and increased performance. The sample consisted of 191 male and female athletes ranging in age from 14 to 35 years old. They played soccer, volleyball and basketball and they were cadets (43%), juniors (29.6 %) and adults (27.4%). Results showed that satisfaction of the basic psychological needs was the strongest predictor of positive self-talk or positive thoughts during competition. Specifically, perception of autonomy was the strongest predictor, because it positively predicted concentration, control of anxiety and instructions, followed by perception of competence, which positively predicted confidence. Finally, team sports coaches should promote perception of autonomy and competence in their athletes, with the aim of enhancing more positive self-talk in competition, which may promote a better performance.

Key words: self-determination, autonomy, team potency, internal dialogue, sport performance.

Introduction

Self-talk, defined as “the cognitions shown as an internal dialogue in which individuals interpret their feelings and perceptions, regulate and change evaluations and give themselves advice and support to their conduct and cognitive structure” (Latinjak et al., 2011), is one of the most important variables in an individual's behavior and emotions (Van Raalte et al., 2016). In the context of sport psychology, this variable is crucial in sport performance, because this knowledge will allow the athlete to identify and modify the maladaptive internal dialogue promoted by competition-generated anxiety (Blanchfield et al., 2014; Hardy et al., 2015; Hatzigeorgiadis et al., 2014).

In this sense, in the context of clinical psychology, self-talk emerges as one of the most common variables for the treatment of fear,

anxiety, and depression (Kross et al., 2014). Specifically, self-talk refers to a cognitive behavioral modification technique based on changing negative thoughts for other more useful ones to improve self-control (Hardy et al., 2009). Hence, when we extrapolate these concepts to sport psychology, it is important to promote positive self-talk that enhances performance, or identify relevant techniques and variables to modify negative self-talk and change it to positive self-talk in a competitive situation.

Thus, according to the different objectives of positive self-talk, emphasis is placed on attention control, creation of mood, increased concentration, improvement of sport performance, and a decrease of anxiety (Latinjak et al., 2010, 2011). Specifically, it is a technique to cope with anxiety that challenges and changes irrational beliefs, using internal talk. This

¹ - Centre for Sport Studies. Physical Education Area, Rey Juan Carlos University, Alcorcón, Madrid (Spain).

² - University of Murcia (Spain).

³ - Sports Research Center. Miguel Hernández University of Elche, Alicante (Spain)

⁴ - Department of Didactic of Musical, Plastic and Corporal Expression. Teacher Training College. University of Extremadura, Cáceres (Spain).

technique allows focusing attention on the relevant stimulus and the appropriate emotional states, which could decrease the psychophysiological response of anxiety (Hatzigeorgiadis et al., 2008).

Within the field of social psychology, increasingly more studies have attempted to examine sport groups' dynamics, in order to observe their influence on performance. Regarding these dynamics, in the last years, the importance of collective beliefs on team capacity, known as team potency, has been emphasized (Del Barco et al., 2016). Team potency has been defined as the group's existing beliefs, an essential construct related to motivation and group cohesion (Guzzo et al., 1993). Studies on these topics in different contexts have shown the relationship between team potency and group performance (Collins and Parker, 2010; Gully et al., 2002; Lester et al., 2002; Sivasubramaniam et al., 2002).

Hence, team potency is the most relevant variable to predict performance and collective efficacy when compared with other variables such as group composition, interdependence, work design, and organizational context (Campion et al., 1996). Collective efficacy has been defined as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997). Del Barco et al. (2016) revealed that team potency is one of the most relevant motivational variables related to collective efficacy, which improves team members' attitude to successfully achieve a task, and the capacity to resolve problems that might emerge during team work.

Thus, it could be interesting to determine whether this capacity to solve problems during team work affects team sport participants' internal self-talk competitions. In this regard, it is important to note that, although previous research has been carried out with different team sports, some authors like Gil et al. (2005) have already shown that the benefits of team potency on work teams are independent of the context in which the teams work.

Moreover, in addition to studying team potency as a social variable that might affect self-talk and sport performance, another antecedent is motivation. This variable is considered the most

determinant variable of human behavior, as it is a psychological mechanism that influences the direction, intensity, and persistence of behavior (Weiner, 2013).

In achievement contexts such as sport, one of the most studied motivational theories is the Self-Determination Theory (Ryan and Deci, 2000). This theory analyzes the degree to which human behavior is voluntary or self-determined, and guided by the satisfaction of the basic psychological needs: autonomy (which involves feeling a sense of personal agency and volition), competence (which refers to interacting effectively with one's environment, while mastering challenging tasks), and relatedness (which refers to a sense of meaningful connection within one's social milieu). Satisfaction of these needs promotes an increase of self-determined or intrinsic motivation, whereas the thwarting of these needs promotes the appearance of less self-determined or extrinsic motives, or even amotivation (Deci and Ryan, 2000; Dysvik et al., 2013; Gagné and Deci, 2005; Philippe and Vallerand, 2008).

Hence, the highest degree of self-determination is intrinsic motivation, defined as the performance of an activity for pleasure, satisfaction, or learning itself. This type of motivation has been associated with positive consequences such as enjoyment, effort, desire to participate, and the intention to continue practicing an activity (Gillet et al., 2010; Jõesaar et al., 2012). The second degree is extrinsic motivation, which represents activities that yield specific outcomes in terms of rewards or avoiding punishment. In this type of motivation, there is a continuum of behavioral regulation reflecting the degree to which the behavior has been integrated into the individual's sense of self: identified regulation, introjected regulation, and external regulation (Ryan and Deci, 2000). Finally, the lowest level of self-determination is amotivation, representing a lack of any drive for behavior.

This study aimed to examine whether motivational (level of self-determination and satisfaction of the basic psychological needs) and social antecedents (team potency) related to athletes' cognitive behavior (self-talk) during competition in team sports. Thus, the aim was to discover the determinant factors of athletes' internal positive self-talk that might lead to

decreasing anxiety and increasing performance. This would have an important application in the sports domain because, if we know how to promote positive self-talk and reduce players' worries, negative thoughts, and prejudices, we can design intervention protocols with the teams to create positive patterns of thoughts, as well as to optimize their performance so it is not affected by anxiety.

Methods

Participants

The sample consisted of 191 athletes from three different sport modalities. Hence, 143 (74.9%) were soccer players, 18 (9.4%) played volleyball and 30 (15.7%) were basketball players. The categories were cadet (43%), junior (29.6%) and adult (27.4%), belonging to a large city in Spain. Athletes were male ($n = 14$, 73.3%) and female ($n = 51$, 26.7%), ranging in age from 14 to 35 years ($M = 17.74$, $SD = 3.73$).

Measures

Behavioral Regulation in Sport Questionnaire (BRSQ). The version adapted and translated into Spanish by Moreno-Murcia et al. (2011) of the Behavioral Regulation in Sport Questionnaire (Lonsdale et al., 2008) was used. This scale has 2 versions, one of 36 items and the other of 24 items that assess the same factors (intrinsic motivation, integrated, identified, introjected, external and amotivation). The difference is that in the 36-item version, intrinsic motivation is measured through three factors or types of intrinsic motivation (towards knowledge, practice and stimulation). In this case, the short 24-item version was used, with 6 factors and 4 items per factor. These factors measured intrinsic motivation (i.e., "because I enjoy it"), integrated regulation (i.e., "because it is part of my life"), identified regulation (i.e., "because sport benefits are important for me"), introjected regulation (i.e., "because I feel ashamed if I dropout"), external regulation (i.e., "because if I do not do it, others would not be content with me") and amotivation (i.e., "but I do not know why I perform it"). The introductory sentence was: "I play this sport...". Responses were rated on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

This study also used the Self-Determination Index (SDI), calculated through the following formula: $(2 \times \text{Intrinsic Regulation} + \text{Identified Regulation}) + ((\text{Introjected Regulation} +$

$\text{External Regulation}] / 2 + 2 \times \text{Amotivation})$ (Vallerand and Rousseau, 2001).

Basic Psychological Needs Satisfaction Scale.

The version translated into Spanish by Moreno-Murcia et al. (2011) of the Basic Psychological Needs Satisfaction in Exercise Scale (PNSE; Wilson et al., 2006) was used. This instrument assesses satisfaction of the basic psychological needs in the sports domain. It contains 12 items headed by the sentence "In my training..." that are divided into 3 factors: autonomy (four items, i.e., "Free to exercise in my own way"), competence (four items, i.e., "Feel good about my ability to exercise") and relatedness (four items, i.e., close to my exercise companions, I feel comfortable with my teammates"). Responses to this questionnaire are rated on a 6-point Likert scale ranging from 1 (*Completely false*) to 6 (*Completely true*).

Team Potency (CPE). The instrument created by Del Barco et al. (2017) and the definition by Guzzo et al. (1993), based on the group's collective efficacy and motivation, was adapted. It includes 10 items under a factor called potency (i.e., "My team has confidence in itself"; "My team has a high degree of efficacy"). Responses were rated on a 10-point Likert scale, ranging from 1 (*Strongly disagree*) to 10 (*Strongly agree*).

Automatic Self-Talk Questionnaire for Sports (ASTQS). A version translated into Spanish (Latinjak et al., 2016) of the instrument created and validated by Zourbanos et al. (2009) was used. This instrument measures the content and structure of athletes' internal self-talk during the competition. Based on their last competition, athletes responded about the feelings they usually experienced or they intentionally used during competitions. The questionnaire contains 40 items grouped into 8 factors including four positive factors: Concentration (five items, i.e., "Make your best effort"), Anxiety control (four items, i.e., "Do not get angry"), Confidence (five items, i.e., "I am well prepared") and Instructions (five items, i.e., "Be focused on what you have to do right now"), three negative factors: Worry (seven items, i.e., "I cannot get focused"), Retirement (five items, i.e., "I want to drop out") and Somatic fatigue (five items, i.e., "My body is not fit"), and one neutral factor: Irrelevant thoughts (three items, i.e., "I am hungry"). Responses were rated on a 5-

point Likert scale, ranging from 0 (*Never*) to 4 (*Very often*).

Procedures

The study previously received the approval of the Ethics Committee of the Miguel Hernández University. All participants were treated in accordance with the ethical guidelines of the American Psychological Association with respect to consent, confidentiality, and anonymity of the data. Before carrying out the research study, all those involved were informed about the process that would be followed, emphasizing the fact that participation was voluntary and that the data would be dealt with confidentially. To carry out data collection, researchers contacted the clubs to request their participation in the study and the consent of the legal guardians of minors, indicating the aims of the research and the subsequent data treatment, as well as guarantee always their anonymity (World Medical Association, 2001). Ethical guidelines of the American Psychological Association regarding participants' informed consent were followed.

The procedure followed for data collection was through a single administration of all the questionnaires. Participants completed the questionnaires in the changing room, individually and without the presence of the coach, in an adequate setting to avoid any kind of distraction. The duration of data collection was approximately 20 minutes. The main researcher was always in the room to clarify any queries that might arise during the process. Participants were requested to answer the questions as honestly as possible.

Statistical Analysis

The statistical program SPSS 22.0 was used to conduct the analyses such as factorial analysis, reliability analysis, descriptive analysis, correlational analysis, regression analysis and multiple comparisons (Tukey's test).

Results

Descriptive Statistics

Table 1 shows the descriptive statistics of each factor included in the study. Firstly, reliability values were obtained through the Cronbach's alpha coefficient, showing that all factors had scores over .70, with the exception of Introjected Regulation, which had a slightly lower value (.55). However, due to the small number of items that made up this last factor and the

characteristics of the sample, internal validity could be accepted (Hair et al., 1998; Lowenthal, 2001; Nunnally and Bernstein, 1995).

Subsequently, means and standard deviations of each factor were calculated. Regarding the means, higher values were obtained for Integrated Regulation ($M = 5.93$) and Intrinsic Regulation ($M = 5.90$), whereas External Regulation and Amotivation had a low mean. Moreover, Satisfaction of the Basic Psychological Needs obtained high means, with Relatedness obtaining the highest score ($M = 4.41$). Team potency had a high mean of 7.58 points out of 10, and, with respect to Self-talk, the results indicated a predominance of positive self-talk (Concentration, Anxiety Control, Confidence and Instructions) with a mean in all factor close to 3 out of 4 points, versus negative or neutral self-talk (Worry, Retirement, Somatic Fatigue and Irrelevant Thoughts) with a mean close to 1 out of 4 points.

Correlation Analysis

A bivariate correlation analysis was conducted to test the relationships between the different factors included in the research. Table 2 shows all significant correlations. Firstly, regarding the associations between Team Potency and motivational variables, the highest relationship was between Perception of Autonomy and Team Potency ($r = .33$). Moreover, regarding the correlations between Team Potency and Self-talk, there were positive relationships between Team potency and positive factors of Self-talk, such as Concentration, Confidence and Instructions, and negative associations with the negative factors (Worry, Retirement and Somatic Fatigue), as well as with the neutral factor (Irrelevant Thoughts).

Secondly, regarding motivation and self-talk factors, a positive correlation was found between Intrinsic, Integrated and Identified Regulation, as well as Satisfaction of Autonomy, Competence and Relatedness and positive self-talk factors such as Concentration, Confidence and Instructions. In contrast, External Regulation and Amotivation had a positive relationship with negative Self-talk factors (Worry, Retirement and Somatic Fatigue) and the neutral factor (Irrelevant Thoughts). Specifically, the positive correlations between Amotivation and Retirement ($r = .53$), as well as between Amotivation and Irrelevant

Thoughts ($r = .34$) are highlighted. Furthermore, regarding basic psychological needs, thoughts of Retirement increased when Relatedness Satisfaction was low ($r = .34$) and, if the need of Competence was met, two significant relationships emerged: a positive association with internal talk about Confidence ($r = .46$) and a negative correlation with internal talk about Worry ($r = -.35$).

Lastly, we noted that higher correlations were found between the factors included in the same variable, for example, in Motivation, the relationship between Intrinsic and Integrated Regulation ($r = .61$), and between Intrinsic and Identified Regulation ($r = .67$). With respect to Self-talk, this association was also found between Instructions and Concentration ($r = .60$), Instructions and Confidence ($r = .61$), Retirement and Worry ($r = .77$), Somatic Fatigue and Worry ($r = .74$), as well as between Irrelevant Thoughts and Retirement ($r = .56$). The same was observed between Worry and Irrelevant Thoughts ($r = .64$), Retirement and Somatic Fatigue ($r = .59$), and Retirement and Irrelevant Thoughts ($r = .56$).

Means comparison

A means comparison regarding gender, with the aim to know whether there were significant differences with respect to gender in the variables studied, and due to the fact that the gender participation was not homogeneous, was conducted. In this regard, the total of the sample was formed by 140 male individuals and 51 female participants. Significant differences were found in the following variables: introjected regulation ($F = 4.90$; $p < .05$; Males Mean = 4.99; Females Mean = 4.53), extrinsic regulation ($F = 7.92$; $p < .05$; Males Mean = 3.42; Females Mean = 2.69), autonomy ($F = 4.63$; $p < .05$; Males Mean = 3.81; Females Mean = 3.52); and self-determination index ($F = 4.58$; $p < .05$; Males Mean = 15.27; Females Mean = 18.46). Thus, male means were greater in all variables previously indicated compared to female averages, with the exception of the self-determination index.

Regression Analysis

A regression analysis was performed to identify which predictor variables better explained the dependent variable. In this study, predictor or independent variables were Self-determined Motivation (1), Basic Psychological Needs (2), Team Potency (3), and gender (4),

included as a dummy variable (0 for boys and 1 for girls) due the differences obtained in the means comparison. Self-talk was the dependent variable, in its two components: Positive thoughts which included four factors and Negative or Neutral thoughts, which included the other four factors.

Before examining the results obtained in each factor, we shall explain the global outcomes of the two previously mentioned components. On the one hand, Positive Self-talk reached a significance of $p < .05$, which meant that the predictor variables partially explained the variance of the dependent variable. The value of R^2 revealed that Self-determined motivation explained 3.6%, Basic Psychological Needs explained 20.2% (16.6% of ΔR^2) and Team Potency explained 23.7% (3.5% ΔR^2) of the variance of Positive Self-talk. Gender was not included in the equation. The predictor variables were not all equally relevant, because only Self-determined motivation and Autonomy were statistically significant.

On the other hand, Negative Self-talk reached significance of $p < .05$, which revealed that the predictor variables partially explained the variance of the dependent variable. The value of R^2 indicated that Self-determined motivation explained 17.8%, Basic Psychological Needs explained 25.2% (7.4% of ΔR^2) and Team Potency explained 28.8% of the variance of Negative Self-talk (3.6% of ΔR^2). Gender was not included in the equation. The predictor variables were not all equally relevant, because only Self-determined Motivation, Autonomy and Team Potency were statistically significant. Regression analysis of each factor of the two components of self-talk is shown in Tables 3 and 4.

Table 3 shows the regression analysis of the Positive Self-talk factors, where Self-determined Motivation, Autonomy and Team Potency partially explained the variance of Concentration

The strongest predictor of Concentration was the Need of Autonomy, because the inclusion of this factor in Step 2 increased the explained variance by 14%, compared to the index of Self-determination, which explained 7% of the variance in Step 1, and Team Potency, which increased the variance by 7% when included in Step 3.

Regarding Anxiety Control, only the Need of Autonomy partially explained its variance (5%), indicating that greater Satisfaction of Autonomy would lead to more Anxiety Control self-talk during competition (for example: "Calm down").

Self-determined motivation and Competence partially explained the variance of

Confidence. The strongest predictor was Competence, as its inclusion in Step 2 increased the explained variance by 21%, compared to the increase of 3% produced by Self-determined motivation.

Table 1

Descriptive Statistics and reliability analysis

<i>Variables</i>	<i>α</i>	<i>M</i>	<i>SD</i>
Intrinsic regulation	.77	5.90	1.03
Integrated regulation	.70	5.93	1.01
Identified regulation	.80	5.74	1.08
Introjected regulation	.55	4.87	1.28
External regulation	.72	3.23	1.60
Amotivation	.73	2.61	1.48
Autonomy	.75	3.74	.79
Competence	.73	4.21	.67
Relatedness	.80	4.41	.73
Team Potency	.92	7.58	1.53
Concentration	.62	3.27	.52
Anxiety Control	.70	2.44	.85
Confidence	.70	3.20	.59
Instructions	.70	3.14	.64
Worry	.81	1.12	.82
Retirement	.77	.86	.83
Somatic Fatigue	.73	1.32	.86
Irrelevant Thoughts	.70	1.28	1.06

Note: α (Cronbach's alpha coefficient), M (Mean), SD (Standard Deviation)

Table 2

Bivariate correlations between the studied variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Intrinsic regulation	1	.61**	.67**	.27**	.03	-.21**	.25**	.29**	.31**	.19**	.37**	.09	.27**	.33**	-.16*	-.19**	-.14*	-.07
Integrated regulation		1	.52**	.33**	-.05	-.21**	.22**	.25**	.30**	.08	.31**	.12	.21**	.26**	-.13	-.12	-.04	-.04
Identified regulation			1	.26**	.09	-.07	.26**	.18*	.25**	.09	.32**	.10	.24**	.27**	-.12	-.14*	-.14*	-.08
Introjected regulation				1	.35**	.10	.22**	.15*	.12	.20**	.24**	.15*	.18*	.27**	.10	.05	.05	.13
External regulation					1	.51**	.18*	-.03	-.04	.19**	.03	.20**	.17*	.16*	.20**	.21**	.17*	.23**
Amotivation						1	.03	-.23**	.11	-.19**	-.05	-.18*	-.18*	.46**	.53**	.35**	.34**	
Autonomy							1	.52**	.40**	.33**	.36**	.21**	.35**	.28**	-.25**	-.21**	-.23**	-.27**
Competence								1	.47**	.19*	.33**	.10	.46**	.26**	-.35**	-.25**	-.27**	-.18*
Relatedness									1	.18*	.33**	.06	.32**	.22**	-.23**	-.34**	-.16*	-.07
Team Potency										1	.26**	.12	.22**	.27**	-.18*	-.18*	-.21**	-.21**
Concentration											1	.17*	.55**	.60**	-.27**	-.27**	-.22**	-.11
Anxiety Control												1	.25**	.37**	.03	.05	-.05	.01
Confidence													1	.61**	-.27**	-.29**	-.17*	-.05
Instructions														1	-.18*	-.22**	-.17*	-.05
Worry															1	.77**	.74**	.64**
Retirement																1	.59**	.56**
Somatic Fatigue Irrelevant Thoughts																	1	.56**

*Note: ** Correlation is significant at .01 level
 * Correlation is significant at .05 level.*

Table 3*Regression analysis coefficient taking positive self-talk as the dependent variable*

Variables	Non-standardized Coefficients		Standardized coefficients		ΔR^2	p
	B	Standard E.	Beta	T		
Concentration						
Step 1					.07*	
Self-Determination Index	.02	.00	.28	3.97		.00
Step 2					.14*	
Self-Determination Index	.01	.00	.20	2.87		.00
Autonomy	.17	.05	.26	3.31		.00
Step 3					.07*	
Self-Determination Index	.01	.00	.18	2.59		.01
Autonomy	.11	.05	.17	2.07		.04
Team Potency	.05	.03	.16	2.02		.04
Anxiety Control						
Step 2					.05*	
Autonomy	.23	.09	.22	2.49		.01
Confidence						
Step 1					.03*	
Self-Determination Index	.01	.00	.17	2.35		.02
Step 2					.21*	
Competence	.29	.07	.33	4.04		.00
Instructions						
Step 1					.03*	
Self-Determination Index	.01	.00	.19	2.67		.01
Step 2					.08*	
Autonomy	.16	.07	.19	2.35		.02

* $p < .05$

Table 4
Regression analysis coefficient taking negative self-talk as the dependent variable

Variables	Non standardized coefficients		Typified Coefficients		ΔR ²	p
	B	Standar E.	Beta	T		
Worry						
Step 1					.16*	
Self-Determination Index	-.04	.01	-.40	-6.07		.00
Step 2					.08*	
Self-Determination Index	-.03	.01	-.35	-5.08		.00
Competence	-.23	.10	-.19	-2.36		.02
Step 3					.03	
Self-Determination Index	-.03	.01	-.37	-5.31		.00
Competence	-.21	.10	-.17	-2.05		.04
Team Potency	-.10	.04	-.19	-2.47		.01
Retirement						
Step 1					.19*	
Self-Determination Index	-.04	.01	-.44	-6.78		.00
Step 2					.06*	
Self-Determination Index	-.03	.01	-.38	-5.60		.00
Relatedness	-.19	.08	-.17	-2.25		.03
Step 3					.02*	
Self-Determination Index	-.03	.01	-.39	-5.86		.00
Relatedness	-.17	.08	-.15	-2.08		.03
Team Potency	-.08	.03	-.14	-2.22		.02
Step 4					.02*	
Self-Determination Index	-.03	.01	-.42	-6.24		.00
Relatedness	-.18	.08	-.16	-2.23		.02
Team Potency	-.09	.03	-.17	-2.54		.01
Gender	.27	.12	.14	2.28		.02
Somatic Fatigue						
Step 1					.10*	
Self-Determination Index	-.03	.01	-.31	-4.47		.00
Step 2					.06*	
Self-Determination Index	-.03	.01	-.28	-3.83		.00
Autonomy	-.18	.09	-.16	-2.02		.04
Step 3					.04*	
Self-Determination Index	-.03	.01	-.30	-4.07		.00
Team Potency	-.12	.05	-.21	-2.60		.01
Irrelevant Thoughts						
Step 1					.10*	
Self-Determination Index	-.03	.01	-.30	-4.39		.00
Step 2					.09*	
Self-Determination Index	-.04	.01	-.33	-4.67		.00
Autonomy	-.43	.11	-.32	-3.98		.00
Step 3					.04*	
Self-Determination Index	-.04	.01	-.34	-4.71		.00
Autonomy	-.34	.12	-.25	-2.88		.00
Team Potency	-.13	.06	-.18	-2.23		.03

*p<.05

This means that greater satisfaction of Competence will lead to more Confidence self-talk during competition (for example: "I can do it").

The last factor of Positive self-talk was Instructions. Table 3 shows that Self-determined motivation and Autonomy were significant predictors. The strongest predictor of Instructions was the Need of Autonomy (which increased the explained variance by 8% when included in Step 2). That is to say, the greater the satisfaction of the Need of Autonomy, the more Self-talk of Instructions (for example: "Be focused on your purpose").

Table 4 shows the regression analysis of the factors included in Negative self-talk. It can be seen that Self-determined motivation, Competence and Team Potency partially explained the Worry factor. The strongest predictor was Self-determined motivation, which increased by 16% the variance explained in Step 1. Competence also increased the explained variance by 8%, when included in Step 2. The negative sign means that the greater the Self-determined motivation and Satisfaction of Competence, the lower the self-talk of Worry (for example: "I am going to lose").

Regarding Retirement factor, Self-determined motivation and Relatedness partially explained its variance. The strongest predictor of Retirement was Self-determined motivation, which explained 19% of the variance. In Step 2, the inclusion of Satisfaction of Relatedness increased the explained variance by 6%. The inclusion of team potency in step 3 increased the explained variance by 2%. Finally, in Step 4, gender predicted significantly retirement, explaining 2% of variance.

The most powerful predictor of Somatic Fatigue (with 10% of explained variance) was Self-determined motivation. The inclusion of the Need of Autonomy in Step 2 increased the explained variance by 6% ($\beta = -.18$). This reveals that the greater the Self-determined motivation, the lower the Somatic Fatigue Self-talk during competition (for example: "I am tired").

The last factor included in Negative self-talk was Irrelevant Thoughts. Table 4 shows that Self-determined motivation, Autonomy and Team Potency partially explained its variance, because its significance was lower than .05. The strongest

predictor was Self-determined motivation with 10% of explained variance. When autonomy was included in Step 2, the explained variance increased by 9%. The next predictor was Team Potency, which increased the explained variance of Irrelevant Thoughts by 4% when included in Step 3.

Discussion

The aim of this study was to examine possible motivational (level of self-determination and satisfaction of the basic psychological needs), and social antecedents (team potency) related to athletes' cognitive behavior (self-talk) during competitions in team sports.

In this regard, results showed a positive relationship between self-determined motivation, satisfaction of the basic psychological needs, team potency and positive self-talk. Nevertheless, according to the motivational and social antecedents included in the current research, satisfaction of the basic psychological needs emerged as the strongest predictor of positive self-talk or positive thoughts during competition. Specifically, perception of autonomy was the strongest predictor because it positively predicted concentration, anxiety control and instructions, followed by the perception of competence, which positively predicted confidence.

This revealed that the greater the athletes' satisfaction of autonomy, the higher would be their concentration, anxiety control and self-talk of instructions during competition. The same applies to competence, the more competence the athletes feel, the higher will be their confidence during competition.

Autonomy refers to the feelings of a sense of personal agency and volition. Promoting autonomy in the sport context refers to coach behaviors that allow athletes' freedom of expression and performance, through the transfer of responsibility in decision making, the correct explanation of the aims and structure of the task, and considering the teams' opinions and preferences when performing tasks. Thus, athletes seem to show a predominance of positive self-talk when they feel more autonomous (Oliver et al., 2008). The importance of autonomy is evident in the scientific literature considering that most of the research has emphasized its effects above other basic psychological needs (Cheon et al.,

2015; Gaudreau et al., 2016; Reynolds and McDonough, 2015).

Regarding competence, this need refers to interacting effectively with one's environment, while mastering challenging tasks. When competence is promoted in the sport context, it refers to coach behaviors orientated toward optimizing athletes' perception of skills, adjusting tasks to their level, giving positive feedback about the performance process and allowing enough time to achieve the goals. Hence, when people feel more competent in a certain context, their confidence usually increases, as shown in other studies (Carpentier and Mageau, 2016; McGrane et al., 2016). Nevertheless, despite that competence was the variable with the highest correlation with confident self-talk, it also showed a high correlation and a high regression score with autonomy. These results are consistent with the Cognitive Evaluation Theory postulates (Deci and Ryan, 1985), which suggest that feelings of competence do not develop intrinsic motivation, and therefore, positive self-talk, until they are accompanied by the perception of autonomy.

Furthermore, it is important to note that team potency, as a variable related to athletes' perception of team resources to achieve purposes, is very closely related to competence. However, it was shown to be a positive predictor of concentration and a negative predictor of worry, somatic fatigue and irrelevant thoughts. The most important issue is that a group variable such as team potency was related to individual behavior, and this is more adaptive when athletes perceive more team potency in their sports groups.

If we take into account the four factors included in negative self-talk (worry, retirement, somatic fatigue and irrelevant thoughts), the results are totally contrary. Self-determined motivation was the variable that most negatively predicted negative self-talk in all four factors. This implies that athletes with greater self-determined motivation will have less negative self-talk during competition and, therefore, less worry, retirement, somatic fatigue and irrelevant thoughts. Moreover, while positive self-talk had high positive correlations with intrinsic regulation and satisfaction of the basic psychological needs, negative self-talk showed high positive relationships with amotivation and high negative associations with satisfaction of the basic

psychological needs, mainly competence and relatedness. Therefore, lower satisfaction of competence and relatedness and greater amotivation will lead to a higher predominance of negative thoughts during competition.

These results are consistent with the explanation of amotivation based on the Organism Integration Theory, according to which amotivation is characterized by the absence of the intention to perform something, and therefore, it is probable that the activity was disorganized and accompanied by feelings of frustration, fear or depression (Ryan and Deci, 2000). This is the result of not valuing an activity (Ryan, 1995), not feeling competent to perform it (Bandura, 1986) or not expecting to achieve the desired result (Seligman, 1975), increasing the likelihood of negative self-talk during competition. In accordance with this, regression analysis showed that satisfaction of the basic psychological needs predicted less negative self-talk during competition, such that greater perception of competence predicted less worry, a higher feeling of relatedness predicted less self-talk about retirement during competition, and a greater perception of autonomy predicted less somatic fatigue and fewer irrelevant thoughts. Relatedness is defined as the effort to socialize and be concerned about others, as well as to feel that one has an authentic relationship with others, to feel accepted and intimate with others.

In accordance to this, some authors (Boiché et al., 2014; Sheridan et al., 2014) consider that social factors are very important in dropout and sport abandonment, and it may have been its trigger. Finally, regarding autonomy, as previously mentioned, some authors have emphasized the benefits of feeling more autonomous within the sport context (Chen and Wu, 2016; Cheon et al., 2015; Reynolds and McDonough, 2015). It has even been shown that perception of autonomy is related to positive self-talk (Oliver et al., 2008), so it is logical to think that greater autonomy predicts less negative self-talk, decreasing somatic fatigue and the appearance of irrelevant thoughts.

Once the main results are tested, it is important to note the gender differences found in the studied variables, emphasizing that males showed a lower self-determination index or self-determined motivation, higher introjected and

extrinsic regulation, and a greater perception of autonomy than females. These results may be associated with the fact that the male sample was larger than the female sample, which is a consequence of the affiliate cards (more males are affiliated than females). Nevertheless, besides this unequal participation of males and females in the federations, we highlight that previous studies have found similar results using a larger sample of athletes of both genders and different team sports (Moreno et al., 2009). This result was attributed to a manifestation of different cultures between genders. If we take into account regression analysis including gender, the results showed that being a girl significantly predicted the presence of retirement self-talk. These outcomes should be taken into account in team management so that the coach or sports psychologist has to control these thoughts in both genders, but especially in girls, with the aim to promote greater persistence in times of team difficulty.

In this regard, these cultural differences might be explained by the fact that males and females are aware of the social expectations about their participation in physical activity and sports (Hickey and Fitzclarence, 1999). Thus, whereas males usually show a desire for physical contact sports as a central experience when an acceptable male identity is established (Gard and Meyenn, 2000), females usually show greater preferences for artistic-expressive activities such as dancing (Grieser et al., 2006; O'Neill et al., 2011). Therefore, males may show greater motivation in the team sports studied herein because research has shown that males and females usually show competence and motivation in the physical

activities that they consider more appropriate to their gender (Lee et al., 1999).

Conclusions

In conclusion, after the analysis of the results, we can conclude that the type of self-talk that an athlete performs during competition may be related to self-determined motivation and satisfaction of the basic psychological needs. Thus, the most intrinsic motivation and greater satisfaction of autonomy were the strongest predictors of positive self-talk or positive thoughts during competition.

Limitations of the study are related to the sample, because it was not very large. This may be due to the length of battery of questionnaires, the results of which should be taken with precaution. Moreover, this problem precluded performing structural equation modeling, instead performing an eight factor regression analysis of the dependent variable of the study, self-talk.

Therefore, it is necessary to develop further studies in this area, extending the sample to a greater population, and performing interventions with these individuals. Furthermore, it is important to design programs to carry out with athletes and coaches from different team sports to optimize self-talk and increase performance in competition. Besides, it is also necessary to conduct a follow-up of the gender differences to determine whether these differences continue even after increasing the number of participants. Thus, deep research is needed, starting at early ages to mitigate these cultural differences in the concept of physical activity and sport of females and males.

References

- Appleton PR, Duda JL. Examining the interactive effects of coach-created empowering and disempowering climate dimensions on athletes' health and functioning. *Psychol Sport Exerc*, 2016; 26: 61-70
- Bandura A. The explanatory and predictive scope of self-efficacy theory. *J Soc Clin Psychol*, 1986; 4(3): 359-373
- Blanchfield AW, Hardy J, De Morree HM, Staiano W, Marcora SM. Talking yourself out of exhaustion: The effects of self-talk on endurance performance. *Med Sci Sports Exerc*, 2014; 46(5): 998-1007
- Boiché J, Plaza M, Chalabaev A, Guillet-Descas E, Sarrazin P. Social antecedents and consequences of gender-sport stereotypes during adolescence. *Psychol Women Quart*, 2014; 38(2): 259-274

- Campion MA, Papper EM, Medsker GJ. Relations between work team characteristics and effectiveness: A replication and extension. *Pers Psychol*, 1996; 49(2): 429-452
- Carpentier J, Mageau GA. Predicting sport experience during training: The role of change-oriented feedback in athletes' motivation, self-confidence and needs satisfaction fluctuations. *J Sport Exerc Psychol*, 2016; 38: 45-58
- Chen L, Wu CH. When does dispositional gratitude help athletes move away from experiential avoidance? The moderating role of perceived autonomy support from coaches. *J Appl Sport Psychol*, 2016; 28(3): 338-349
- Cheon SH, Reeve J, Lee J, Lee Y. Giving and receiving autonomy support in a high-stakes sport context: A field-based experiment during the 2012 London Paralympic Games. *Psychol Sport Exerc*, 2015; 19: 59-69
- Collins CG, Parker SK. Team capability beliefs over time: Distinguishing between team potency, team outcome efficacy, and team process efficacy. *J Occup Organiz Psychol*, 2010; 83(4): 1003-1023
- Curran T, Hill AP, Hall HK, Jowett GE. Relationships between the coach-created motivational climate and athlete engagement in youth sport. *J Sport Exerc Psychol*, 2015; 37(2): 193-198
- Deci EL, Ryan RM, Williams GC. Need satisfaction and the self-regulation of learning. *Learn In Div Diffence*, 1996; 8(3): 165-183
- Deci EL, Ryan RM. The general causality orientations scale: Self-determination in personality. *J Res Pers*, 1985; 19(2): 109-134
- Deci EL, Ryan RM. The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychol Inq*, 2000; 11(4): 227-268
- Del Barco BL, Lázaro SM, Castaño EF, del Río MIP, Bullón FF. Team potency and cooperative learning in the university setting. *J Psychologist*, 2017; 22: 9-15
- Dysvik A, Kuvaas B, Gagné M. An investigation of the unique, synergistic and balanced relationships between basic psychological needs and intrinsic motivation. *J Appl Soc Psychol*, 2013; 43(5): 1050-1064
- Filho E, Tenenbaum G, Yang Y. Cohesion, team mental models, and collective efficacy: towards an integrated framework of team dynamics in sport. *J Sports Sci*, 2015; 33(6): 641-653
- García-Calvo T, Leo FM, Gonzalez-Ponce I, Sánchez-Miguel PA, Mouratidis A, Ntoumanis N. Perceived coach-created and peer-created motivational climates and their associations with team cohesion and athlete satisfaction: evidence from a longitudinal study. *J Sports Sci*, 2014 ; 32(18): 1738-1750
- Gard M, Meyenn, R. Boys, bodies, pleasure and pain: Interrogating contact sports in schools. *Sport, Educ Soc*, 2000; 5: 19-34
- Gaudreau P, Morinville A, Gareau A, Verner-Filion J, Green-Demers I, Franche V. Autonomy support from parents and coaches: Synergistic or compensatory effects on sport-related outcomes of adolescent-athletes? *Psychol Sport Exerc*, 2016; 25: 89-99
- Gil F, Alcover CM, Peiró JM. Work team effectiveness in organizational contexts: Recent research and applications in Spain and Portugal. *J Manag Psychol*, 2005; 20(3/4) : 193-218
- Gillet N, Vallerand RJ, Amoura S, Baldes B. Influence of coaches' autonomy support on athletes' motivation and sport performance: A test of the hierarchical model of intrinsic and extrinsic motivation. *Psychol Sport Exerc*, 2010; 11(2): 155-161
- Gioldasis A, Stavrou N, Mitrotasios M, Psychountaki M. Cohesion and performance in soccer: A causal model. *Sport Sci Rev*, 2016; 25(1-2): 97-112
- Grieser M, Vu MB, Bedimo-Rung AL, Neumark-Sztainer D, Moody J, et al. Physical activity attitudes, preferences, and practices in African American, Hispanic, and Caucasian girls. *Health Educ Behav*, 2006; 33: 40-51
- Gully SM, Incalcaterra KA, Joshi A, Beaubien JM. A meta-analysis of team-efficacy, potency, and performance: Interdependence and level of analysis as moderators of observed relationships. *J Appl Psychol*, 2002; 87(5): 819
- Guzzo RA, Yost PR, Campbell RJ, Shea GP. Potency in groups: Articulating a construct. *Br J Soc Psychol*, 1993; 32: 87-106
- Hair J, Anderson R, Tatham R, Black W. *Multivariate data analysis. 5th Edition*. New Jersey: Prentice Hall; 1998

- Hardy J, Begley K, Blanchfield AW. It's good but it's not right: instructional self-talk and skilled performance. *J Appl Sport Psychol*, 2015; 27(2): 132-139
- Hardy J, Roberts R, Hardy L. Awareness and motivation to change negative self-talk. *The Sport Psychol*, 2009; 23(4): 435-450
- Hatzigeorgiadis A, Galanis E, Zourbanos N, Theodorakis Y. Self-talk and competitive sport performance. *J Appl Sport Psychol*, 2014; 26: 82-95
- Hatzigeorgiadis A, Zourbanos N, Goltsios C, Theodorakis Y. Investigating the functions of self-talk: The effects of motivational self-talk on self-efficacy and performance in young tennis players. *The Sport Psychol*, 2008; 22(4): 458-471
- Hickey C, Fitzclarence L. Educating boys in sport and physical education: Using narrative methods to develop pedagogies of responsibility. *Sport, Educ Soc*, 1999; 4: 51-62
- Iso-Ahola SE, Clair BS. Toward a theory of exercise motivation. *Quest*, 2000; 52(2): 131-147
- Jõesaar H, Hein V, Hagger MS. Youth athletes' perception of autonomy support from the coach, peer motivational climate and intrinsic motivation in sport setting: One-year effects. *Psychol Sport Exerc*, 2012; 13(3): 257-262
- Kross E, Bruehlman-Senecal E, Park J, Burson A, Dougherty A, et al. Self-talk as a regulatory mechanism: How you do it matters. *J Pers Soc Psychol*, 2014; 106(2): 304
- Latinjak AT, Hatzigeorgiadis A, Zourbanos N. Goal-Directed and Spontaneous Self-Talk in Anger- and Anxiety-Eliciting Sport-Situations. *J Appl Sport Psychol*, 2016; 29(2): 150-166
- Latinjak AT, Torregrosa M, Renom J. Studying the effects of self-talk on thought content with male adult tennis players. *Percept Motor Skills*, 2010; 111: 249-260
- Latinjak AT, Torregrosa M, Renom J. Combining self-talk and performance feedback: Their effectiveness with adult tennis players. *The Sport Psychol*, 2011; 25: 18-31
- Lee AM, Fredenburg K, Belcher D, Cleveland N. Gender differences in children's conceptions of competence and motivation in physical education. *Sport, Educ Soc*, 1999; 4: 161-175
- Leo FM, González-Ponce I, Sánchez-Miguel PA, Ivarsson A, García-Calvo T. Role ambiguity, role conflict, team conflict, cohesion and collective efficacy in sport teams: A multilevel analysis. *Psychol Sport Exerc*, 2015; 20: 60-66
- Leo FM, Sánchez-Miguel PA, Sánchez-Oliva D, Amado D, García-Calvo T. Analysis of cohesion and collective efficacy profiles for the performance of soccer players. *J Hum Kinet*, 2013; 39: 221-229
- Lonsdale C, Hodge K, Rose EA. The Behavioral Regulation in Sport Questionnaire (BRSQ): Instrument development and initial validity evidence. *J Sport Exerc Psychol*, 2008; 30(3): 323-355
- Lowenthal B. *Abuse and neglect: The educator's guide to the identification and prevention of child maltreatment*. Baltimore, MD: Paul H. Brooks; 2001
- McGrane B, Belton S, Powell D, Issartel J. The relationship between fundamental movement skill proficiency and physical self-confidence among adolescents. *J Sport Sci*, 2016; 1-6
- Moreno JA, Cano F, González-Cutre D, Cervelló E, Ruiz LM. Dispositional flow in lifesaving sport: A self-determination theory approach. *Rev Psicol Dep*, 2009; 18: 23-35
- Moreno-Murcia JA, Marzo JC, Martínez-Galindo C, Marín LC. Validation of Psychological Need Satisfaction in Exercise Scale and the Behavioural Regulation in Sport Questionnaire to the Spanish context. *RICYDE. Rev Int Cienc Deporte*, 2011; 7(26): 355-369
- Nunnally JC, Bernstein IJ. *Psychometric Theory (Third Edition)* New York: McGraw-Hill; 1994
- Oliver EJ, Markland D, Hardy J, Petherick CM. The effects of autonomy-supportive versus controlling environments on self-talk. *Motiv Emot*, 2008; 32(3): 200-212
- O'Neill JR, Pate RR, Hooker SP. The contribution of dance to daily physical activity among adolescent girls. *Int J Behav Nutr Phys Act*, 2011; 8: 87
- Pescosolido AT, Saavedra R. Cohesion and sports teams a review. *Small Group Res*, 2012; 43(6): 744-758
- Reynolds AJ, McDonough MH. Moderated and mediated effects of coach autonomy support, coach involvement, and psychological need satisfaction on motivation in youth soccer. *Sport Psychologist*, 2015; 29: 51-61
- Ryan RM. Psychological needs and the facilitation of integrative processes. *J Pers*, 1995; 63(3): 397-427

- Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol*, 2000; 55: 68-78
- Seligman ME. *Helplessness: On depression, development, and death*. San Francisco, CA: Freeman; 1975
- Sheridan D, Coffee P, Lavallee D. A systematic review of social support in youth sport. *Int Rev Sport Exerc Psychol*, 2014; 7: 198-228
- Smith MJ, Arthur CA, Hardy J, Callow N, Williams D. Transformational leadership and task cohesion in sport: The mediating role of intrateam communication. *Psychol Sport Exerc*, 2013; 14(2): 249-257
- Van Raalte JL, Vincent A, Brewer BW. Self-talk: Review and sport-specific model. *Psychol Sport Exerc*, 2016; 22: 139-148
- Wilson PM, Rogers WT, Rodgers WM, Wild TC. The psychological need satisfaction in exercise scale. *J Sport Exerc Psychol*, 2006; 28(3): 231-251
- World Medical Association declaration of Helsinki: Ethical principles for medical research involving human subjects. *Bulletin of the World Health Organization*, 2001; 79(4): 373
- Zourbanos N, Hatzigeorgiadis A, Chroni S, Theodorakis Y, Papaioannou A. Automatic Self-Talk Questionnaire for Sports (ASTQS): Development and preliminary validation of a measure identifying the structure of athletes' self-talk. *Sport Psychologist*, 2009; 23(2): 233-251
- Zourbanos N, Haznadar A, Papaioannou A, Tzioumaki Y, Krommidas C, Hatzigeorgiadis A. The relationships between athletes' perceptions of coach-created motivational climate, self-talk, and self-efficacy in youth soccer. *J Appl Sport Psychol*, 2016; 28: 97-112

Corresponding author:**Diana Amado Alonso**

Centre for Sport Studies, Physical Education Area,
Rey Juan Carlos University.
Avda. de Atenas s/n 28922, Alcorcón, Madrid (Spain).
Phone: 914 88 88 17
E-mail: diana.amado@urjc.es