

## **Analysis of the relationships between motivational variables and anxiety in competing judokas**

### **Análisis de las relaciones entre variables motivacionales y ansiedad en judocas competidores**

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#### **Resumen**

El judo de alto rendimiento se encuentra en continua evolución, explorándose nuevas formas de enseñanza y entrenamiento, que faciliten conducir al judoca hacia el éxito.

El objetivo del presente trabajo fue analizar las relaciones que se establecen entre los diferentes tipos de motivación autodeterminada, necesidades psicológicas básicas, ansiedad cognitiva, ansiedad somática y autoconfianza en judocas competidores.

Se analizó una muestra de 124 judocas competidores, 36 mujeres y 88 hombres pertenecientes a 16 clubes de toda España, cuyas categorías iban desde infantil hasta senior, con edades comprendidas entre los 12 y los 37 años.

Para llevar a cabo dicho estudio, se pasaron los cuestionarios de Behavioral Regulation in Sport Questionnaire, para medir el nivel de motivación autodeterminada; el Psychological Need Satisfaction in Exercise Scale, para medir la satisfacción de las necesidades psicológicas básicas y el Revised Competitive State Anxiety Inventory, para medir el estado de ansiedad.

Los resultados mostraron que la motivación intrínseca, correlacionó de forma positiva y significativa con la necesidad psicológica básica de competencia además de la autoconfianza en su dimensión intensidad. Por otro lado, la desmotivación, la regulación externa y la

ansiedad somática en su dimensión intensidad, correlacionaron negativa y significativamente con la motivación intrínseca.

Por consiguiente, los entrenadores tendrían que satisfacer las necesidades psicológicas básicas de los judocas, con el fin de provocar un aumento de las formas de motivación más autodeterminadas, pudiendo originar ello una mejora de la autoconfianza y una reducción de los niveles del estado de ansiedad.

### **Palabras clave**

Motivación; necesidades psicológicas básicas; ansiedad estado, judo.

### **Abstract**

High-performance judo is going through continuous evolution, exploring new forms of teaching and training, to facilitate conducting the judoka toward success.

The objective of this study was to analyze the relationships been established between different types of self-determined motivation, basic psychological needs, cognitive anxiety, somatic anxiety and self-confidence in competing judokas.

A sample of 124 competing judokas, 36 women and 88 men belonging to 16 clubs from all over Spain, ranging from children to seniors, ages ranging from 12 to 37, were analyzed.

To carry out this study, the questionnaires for Behavioral Regulation in Sport Questionnaire were used, to measure the level of self-determined motivation; The Psychological Need Satisfaction in Exercise Scale was used, to measure the satisfaction of basic psychological needs and the Revised Competitive State Anxiety Inventory, to measure the anxiety state.

The results showed that intrinsic motivation correlated in a positive and significant way with the basic psychological need for competence as well as the intensity amount for self-confidence. On the other hand, demotivation, external regulation and the intensity amount for somatic anxiety correlated negatively and significantly with intrinsic motivation.

Therefore, trainers would have to satisfy the basic psychological needs of the judokas, in order to trigger an increase in more self-determined forms of motivation, which could lead to an improvement of self-confidence and a reduction of anxiety state levels.

### **Key Words**

Motivation; Basic psychological needs; Anxiety State; judo.

### **Introduction**

High-performance judo is in continuous evolution, being pursued by athletes and coaching staff that want to know and control the greatest number of factors that can influence success in sports (Montero, Moreno-Murcia, Gonzalez, Pulido and Cervelló 2012). Specifically, the analysis of psychological variables is capturing a great deal of interest in recent years (García-Calvo, Sánchez, Leo, Sánchez and Amado, 2011, García-Mas et al., 2015, Zarauz- Sancho and Ruiz-Juan, 2015).

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Thus, at certain levels of competition, the differences between athletes can be explained through their psychological component (Zurita, et al., 2017), arriving at some point even at the existence of a common psychological profile (Grushko et al., 2016).

In relation to the above, motivation is a fundamental variable in sports practice. Defined by Littman (1958), as that which moves the individual towards the realization, maintenance and / or abandonment of physical-sport activities, also referring to the process or condition, which may be physiological or psychological, innate or acquired, internal or external to their body, which determines the reason for this behavior.

The Self-Determination Theory, exposed by Ryan and Deci (2002; 2007), explains the functioning of motivation in humans in social contexts and to what extent people, of their own choice, perform their actions voluntarily (Deci and Ryan, 2008). This social-cognitive theory will be the theoretical framework that will support the present study.

Thus, Deci and Ryan (2000) distinguish, within more or less self-determined forms of motivation, three major groups. In the first one of them is intrinsic motivation, characterized by the satisfaction and pleasure that causes the person to perform or participate in something. In a second group we find extrinsic motivation, subdivided in turn into different types of regulations: integrated regulation, defined by the introversion of said activity in the person's day to day, being considered as another part of their daily life; Identified regulation, characterized by the fact that the person will perform an activity in function of the benefits that he obtains at his social and personal level; Introjected regulation, which brings feelings of guilt that appear in the subject when he does not get to perform the planned activity; And finally, external regulation, by which the subject will perform activities in exchange for some recognition or award. Finally, a third group is composed by those with lack of motivation, characterized by the total absence of intrinsic and extrinsic regulations that imply motivation for the fulfillment of any activity, not having common sense to continue doing so (Deci and Ryan, 2000, Ryan and Deci, 2002).

This theory of self-determination studies the social context and its effect on three basic psychological needs (BPN): autonomy, relatedness and competence Deci and Ryan, 2000. The concept of "needs" refers to the elements that must be identified as necessary to facilitate growth and development of human potential (Ryan, 1993). The need for autonomy refers to

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the ability to take the initiative in regulating one's actions (Ryan and Deci, 2002). The need for competence represents the tendency of the individual to feel competent in their own environment. Finally, the need for social relations reflects the desire to feel united and accepted by other people (Deci and Ryan, 2000).

In order to clarify and interrelate the different concepts that make-up the Theory of Self-Determination, Vallerand (1997) establishes a hierarchical model that considers that motivation occurs at different levels, originating relationships between them, influencing one another: situational, contextual and global levels, contextualizing our work at the contextual and situational levels.

Considering this model, it is understood that social factors influence the three BPNs, which constitute themselves as mediators to determine the type of motivation of the individual and that in turn, will have cognitive, affective and behavioral consequences, since according to the subject's perception that these needs, have been satisfied or not, so will be the degree and type of motivation he possesses in a given context (Vallerand, 1997). This occurs at the three hierarchical levels, amongst which bi-directional relationships are established, that is, the influences at the situational level influence the contextual, but those at the contextual level can also affect the situational level; exactly the same happens between the contextual and global levels (Vallerand, 1997).

Anxiety is another determining psychological variable on athlete's performance, being one of the most analyzed in different sports (Han, Kim and Zaichkowsky, 2013; Molina, Sandín and Chorot, 2014; Morillo, Reigal and Hernández-Mendo, 2016). The types of anxiety that have been measured in this study have been: cognitive anxiety and somatic anxiety. The first one refers to the lack of ability to concentrate, while the second constitutes the degree of perceived physical activity (Jones, 1991).

Anxiety can also be measured depending if it is a trait or state, depending on the time at which the occurrence is analyzed. Thus, Martens (1977) conceptualizes anxiety regarding sports competitions and maintains that there are individuals with a tendency to perceive this type of situations as threatening, denominating it competitive anxiety. The immediate emotional state characterized by feelings of apprehension and tension associated with the body's activation that occurs in competitive situations would be what the author calls anxiety

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competitive state. Thus, following Jones' directionality model (1991), the anxiety state will vary according to its intensity and time duration.

Finally, the current study analyzed the variable self-confidence, which refers to a person's belief that he has to materialize what he wants to do; is one of the important factors in relation to performance (Feltz, 1994), since it plays a fundamental role in reducing or controlling anxiety levels minutes before the competition, this aspect being associated with a higher sport's performance (Cantón and Checa, 2012; Montero, Moreno-Murcia, González-Cutre and Cervelló, 2013).

Next, will proceed to present the bibliographic review made related to the research topics presented. Thus, in the context of physical activity and sport, several studies have analyzed the relationships between BPNs and intrinsic motivation, extrinsic motivation and demotivation (Edmunds, Ntoumanis and Duda, 2006, Gené and Latinjak, 2014, Navarro-Patón, Rodríguez and Eirín, 2016), producing a positive relation between the satisfaction of the BPN's and the intrinsic motivation that leads the subjects to practice physical activity for their own interest. Likewise, lower values of demotivation are also reflected. In the research lines cited in this paragraph, we find the one by Montero, Moreno-Murcia, González-Cutre, and Cervelló (2013), based on a sample of 128 judokas of different ages from Spanish Clubs, concluding that the perception of competition, autonomy and social relations acted as mediators for intrinsic motivation, being the perception of competence the most important.

Authors such as Cecchini, González, Carmona and Contreras (2004), have studied the relationship between anxiety and different variables such as intrinsic motivation, extrinsic motivation or demotivation, finding that the two states of anxiety (cognitive and somatic) were positively related with extrinsic motivation, which caused that athletes with external interests demonstrated elevated levels of anxiety. The results of the study carried out by García-Mas et al. (2015) are in this same line, since intrinsic motivation had no influence over the probability of athletes presenting anxiety before the competition.

Recent studies that follow our research line, such as Leyton, Da Silva, Cejas, Lobato, and Jiménez (2015), with a sample of 45 handball players, affirm that somatic and cognitive

anxiety before competition, the amount of direction correlated negatively and significantly with demotivation and the basic psychological need for competition.

To finish the review of the research stage, highlight a reference to self-confidence variable, the work of Montero et al. (2012), carried out with 128 Spanish judokas of different ages and sports levels, in which it was concluded that there were positive and significant relationships between self-confidence and intrinsic motivation and competition BPN.

Variables that can determine the performance of competing judokas are therefore included in different research papers, establishing as an objective in this study: to analyze the relationships established in competitive judokas at different levels of self-determined motivation (general intrinsic motivation, intrinsic motivation towards knowledge, intrinsic motivation towards execution, intrinsic motivation towards stimulation, integrated regulation, identified regulation, introjected regulation, external regulation and demotivation), autonomous, competence and social relations and cognitive anxiety BPN (intensity and direction), somatic anxiety (intensity and direction) and self-confidence (intensity and direction).

## **Method**

### ***Design***

The study's design is: ex post facto, retrospective and simple group (Montero and León 2007), descriptive cross-section, in which the variables described above are not intervened or manipulated, only what happens with them in natural conditions is observed (Cubo, Martín, and García, 2011).

The variables of our study were the different levels of self-determined motivation, BPN (autonomy, competence and social relations) and the judoka's anxiety state.

### ***Participants***

Intentional sampling by clusters was used (Azorín and Sánchez-Crespo, 1986), making sure that the characteristics of the population were represented. The study's sample consisted of a total of 124 competitors, 36 women and 88 men belonging to 16 clubs across Spain, ranging from children to seniors, with ages between 12 and 37 years old ( $M = 17.23$ ;  $SD = 5.15$ ).

### ***Instruments***

In order to measure the first variable, self-determined motivation levels, a contextual measurement instrument was used, Behavioral Regulation in Sport Questionnaire (BRSQ), by Lonsdale, Hodge and Rose (2008), validated in Spanish by Moreno-Murcia, Marzo, Martinez, and Conte (2011). This instrument made it possible to observe that motivation towards practice prevailed in the subject. It is composed of 36 items that measure 9 factors: general intrinsic motivation, intrinsic motivation towards knowledge, intrinsic motivation towards execution, intrinsic motivation towards stimulation, integrated regulation, identified regulation, introjected regulation, external regulation and demotivation.

A second instrument was able to measure the satisfaction of BPN at a contextual level in the sport's realm, Psychological Need Satisfaction in Exercise Scale (PNSE), validated by Moreno-Murcia, March, Martinez, and Conte (2011). It has 18 items, which measure 3 factors: autonomy, competition and social relations BPN.

For the third and last variable, anxiety state, the Revised Competitive State Anxiety Inventory (CSAI-2R), by Cox, Martens, and Rusell (2003) was used, validated and translated into Spanish by Andrade, Lois, and Arce (2007). The instrument consists of 17 items and also measures 3 factors, somatic anxiety, cognitive anxiety and self-confidence, measured through an intensity and directionality scale.

## ***Procedure***

In the first place, all participants were informed of the risks and benefits of the study and provided a document with the expressed consent of their parents or guardians, following the Helsinki Declaration of the World Medical Association. Subsequently, a battery of questionnaires was given to the judokas, indicating to them that the anxiety questionnaire (CSAI-2R) could only be completed moments before the competition, 10 minutes before entering the mat.

Once the questionnaires were collected, we recorded the sample and performed the analysis that is detailed below.

## ***Data Analysis***

We performed a Kolmogorov-Smirnov normality test and homogeneity of variances using the Levene test, showing that the results obtained had a normal data distribution.

Likewise, a factorial and reliability analysis was carried out to verify the validity of the items and the internal consistency of all the instruments, as well as a descriptive analysis. In addition, we developed a Pearson correlation analysis to observe how the variables correlated to each other.

Finally, point out that we used the computer statistical program, IBM SPSS Statistics version 21. for the registration of the sample and the analysis of the data.

## **Results**

### ***Descriptive analysis, reliability and correlations***

First, the descriptive statistics of the measurement instruments used to carry out the study are presented, where the mean and standard deviation are shown (Table 1).

Table 1. Descriptive and Reliability Statistics



<i>Variables</i>	<i>Range</i>	<i>Median</i>	<i>SD</i>	<i>Cronbach Alpha</i>
1. IM. General	1-7	6.75	.40	.63
2. IM. Knowledge	1-7	6.35	.83	.83
3. IM. Stimulation	1-7	6.30	.79	.74
4. IM. Execution	1-7	6.41	.59	.75
5. R. Integrated	1-7	6.04	1.07	.80
6. R. Identified	1-7	6.11	.85	.68
7. R. Introjected	1-7	3.33	1.83	.81
8. R. External	1-7	1.74	1.04	.63
9. Demotivation	1-7	1.45	.79	.70
10. BPN. Competition	1-6	5.37	.79	.92
11. BPN. Autonomy	1-6	3.65	1.14	.83
12. BPN. Social Relations	1-6	5.50	.57	.65
13. A. I. Cognitive	1-4	2.54	.82	.78
14. A. I. Somatic	1-4	2.33	.74	.86
15. I. Self Confidence	1-4	3.18	.58	.74
16. A. D. Cognitive	-3-+3	-.24	1.29	.81
17. A. D. Somatic	-3-+3	-.28	1.43	.86
18. D. Self Confidence	-3-+3	1.35	1.26	.83

*Note:* IM: Intrinsic Motivation; R: Regulation; BPN: Basic Psychological Need; A: Anxiety; I: Intensity; D: Direction

To verify how the different study variables were related, a correlation analysis was performed between the types of intrinsic motivation (general intrinsic motivation, intrinsic motivation towards knowledge, intrinsic motivation towards execution, intrinsic motivation towards stimulation), integrated regulation, identified regulation, introjected regulation, external regulation, demotivation, BPN (autonomy, competence and social relations) and cognitive anxiety, somatic anxiety and self-confidence (Table 2).

Table 2. Correlation Analysis

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1. IM. General	-																		
2. IM. Knowledge	.36**	-																	
3. IM. Stimulation	.33**	.41**	-																
4. IM. Execution	.28**	.40**	.48**	-															
5. R. Integrated	.28**	.31**	.35**	.64**	-														
6. R. Identified	.13	.38**	.39**	.53**	.47**	-													
7. R. Interjected	-.08	.04	.06	.14	.21*	.19*	-												
8. R. External	-.24**	-.09	.01	-.08	-.06	.01	.30**	-											
9. Demotivation	-.29**	-.07	-.10	-.17	-.11	-.04	.10	.38**	-										
10. BPN. Competence	.19*	.34**	.51**	.22*	.08	.12	-.05	-.06	-.04	-									
11. BPN. Autonomy	-.04	.05	.31**	.07	.00	.27**	-.06	.13	.04	.20*	-								
12. BPN. Social Relations	.17	.44**	.57**	.44**	.33**	.50**	.04	-.07	-.12	.48**	.23**	-							
13. A. I. Cognitive	-.15	.01	.01	.04	.08	-.01	.33**	.20*	.15	-.11	.03	.01	-						
14. A. I. Somatic	-.30**	.00	-.01	.01	-.05	-.03	-.05	.07	.21*	-.11	.06	.02	.37**	-					
15. I. Self-confidence	.27**	.28**	.22*	.32**	.28**	.21*	.09	-.01	-.26**	.33**	.12	.27**	-.17	-.27**	-				
16. A. D. Cognitive	.15	.02	.14	.02	.09	.10	-.16	-.06	-.04	.10	.10	.01	-.60**	-.20*	.23**	-			
17. A. D. Somatic	.21*	.02	.16	.07	.13	.00	.10	-.02	-.18*	.02	.02	-.02	-.18*	-.51**	-.25**	.45**	-		
18. D. Auto-confidence	.15	.01	.07	.15	.12	.01	.08	-.04	-.16	.32**	.05	.07	-.32**	-.34**	.66**	.23**	.19*	-	

Note: IM: Intrinsic Motivation; R: Regulation; BPN: Basic Psychological Need; A: Anxiety; I: Intensity; D: Direction

\* $p < .05$ ; \*\* $p < .01$

Firstly, the results displayed in table 1, show us the mean and the standard deviation, as well as the data obtained after the reliability analysis, carried out to observe the internal consistency of the questionnaires used; we should point out that some variables had Cronbach's Alpha less than .70 (.63 for general intrinsic motivation, .68 for identified regulation, .63 for external regulation, and .65 BPN for social relations), but given the small number of items that make-up the factors, the observed internal consistency may be marginally accepted (Hair, Anderson, Tatham, and Black, 1998).

Subsequently, in Table 2, we find the data obtained concerning the correlation between the variables mentioned above. In this case, the general intrinsic motivation (intrinsic motivation towards knowledge, intrinsic motivation towards stimulation and intrinsic motivation towards execution) is positively and significantly related to the integrated regulation, identified regulation, basic psychological needs of competence and social relations, somatic anxiety (direction) and self-confidence (intensity). Finally, there is a negative and significant relationship between general intrinsic motivation with external regulation, demotivation and somatic anxiety (intensity).

Regarding basic psychological need for competition, we also find a positive and significant relationship with self-confidence in its direction dimension.

## Discussion

Presently, through this study, we tried to find the relationships which are established amongst the different types of self-determined motivation, basic psychological needs and state anxiety, in competing judokas.

The results confirmed that general intrinsic motivation is positively related to the variables of intrinsic motivation (toward knowledge, toward stimulation and towards execution), with integrated regulation, identified regulation, BPN for competence and social relations, cognitive anxiety and somatic (direction) and self-confidence (intensity and direction). There were no positive relationships between the general intrinsic motivation and the variable: BPN for autonomy.

Consequently, following Vallerand's Hierarchical Model (1997) we can deduce that when the satisfaction of basic psychological needs increases, the levels of more self-determined motivation increases, which would lead to an increase of self-confidence.

In addition, general intrinsic motivation had a negative correlation with the variables external regulation, demotivation and cognitive and somatic anxiety (intensity), this aspect could be due to lower levels of motivation provoking an increase in the anxiety state when judokas go to compete. No negative relationships were found between the general intrinsic motivation and the variables: cognitive and somatic anxiety (direction).

Thus, the results presented above are in agreement with those of other studies such as Edmunds, Ntoumanis and Duda (2006), Gené and Latinjak, (2014) or Moreno-Murcia, González, Pulido, and Cervelló, (2012). In the latter study, it was concluded that the perception of competence, autonomy and social relations provoked an increase in intrinsic motivation.

Some investigations show data contrary to what is exposed in the Self-Determination Theory and the results of the present investigation. In the case of Guzman and Carratalá (2006), who carried out an analysis of pre-competitive situational motivation in 181 judokas, ages 14 to 16 years old, depending on the BPM. That time, the data showed the relationship

between BPM and extrinsic motivation with external regulation, observing a positive and significant relationship between these variables.

As for the relationships established between general intrinsic motivation and anxiety state, the results of the study we presented are in line with those found by Montero et al. (2012), where the motivation of the judokas was related to their anxiety state, being, the (intensity) of their pre-competitive self-confidence, which showed a positive relationship with general intrinsic motivation. Similarly, García-Mas et al. (2015) showed that there is little likelihood of competitive anxiety if more self-determined motivation is present.

Coinciding with the study cited in the previous paragraph, we found the research of Ruiz-Juan, Zarauz and Flores-Allende (2015), carried out with long distance runners, in which high levels of self-confidence were obtained and negatively correlate with levels of cognitive and somatic anxiety. Data to be taken into account also in our study, because, if we increase the levels of self-confidence in the judokas, we will control somatic and cognitive anxiety, thus reducing their levels of pre-competitive anxiety.

Similarly, Sancho and Ruiz-Juan (2015) obtained high intrinsic motivation and high self-confidence levels at the same time as moderate extrinsic motivation, cognitive and somatic anxiety and almost no motivation in their study with veteran athletes.

The main limitation found at the time of carrying out the present study was the numerical difference in the sample between the lower and higher categories, in favor of the first, since the number of competing judoka is considerably higher than in the second categories. Another limitation of the study was the non-establishment of cause-effect relationships, when carrying out exclusively a correlation analysis.

It would be of great interest to carry out this same study based on the differences that can be established with respect to the different judokas weight categories or even their gender difference. Also, some other type of analysis could be applied, such as regression analysis, or to expand the sample and to develop a structural equation model. In addition, a program of motivational intervention could also be developed, in order to favor positive performance adaptive consequences in judokas.

## Conclusions

Once the study was carried out and the results analyzed, the following conclusions were obtained:

Intrinsic motivation correlates positively and significantly with competition BPN, in addition to self-confidence.

Demotivation, external regulation, and somatic anxiety (intensity) correlate negatively and significantly with intrinsic motivation.

To conclude, consider of great importance the results obtained concerning motivational variables, since they play a fundamental role in the athlete's psychological training, because greater BPN satisfaction could increase the levels of self-determined motivation in judokas. Self-determined motivation could lead to an increase in self-confidence among athletes. At the same time, higher levels of self-confidence would help judokas to control somatic and cognitive anxiety produced moments before a competition. Thus, it could be of great usefulness for coaches and athletes to try to increase self-confidence

in order to reduce the levels of competitive anxiety state. Por lo anterior podría ser de gran utilidad para entrenadores y deportistas tratar de aumentar la autoconfianza con el fin de reducir los niveles de ansiedad estado competitivos.

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