

PERSONAL FACTORS ASSOCIATED WITH PRE-COMPETITIVE ANXIETY IN ELITE GYMNASTS

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Case study

Abstract

The aim of this study was to analyze how goal orientations and two facets of perfectionism – striving for perfection and negative reactions to imperfection- be related to precompetitive anxiety in elite gymnasts. Thirty seven artistic gymnasts answered a series of questionnaires to measure the study variables. The results showed that cognitive anxiety was related to negative reactions to imperfection, while the self-confidence was predicted by the task orientation. In conclusion, aspects of personality, such as task orientation and negative reactions to imperfection, anticipate the cognitive self-confidence and anxiety, respectively, at the time previous to a senior gymnastics competition.

Keywords: *personality, effort, perfection, goal orientations, emotion.*

INTRODUCTION

The artistic gymnastic can generate anxiety and/or concern for fail during the competition because many of the technical elements defy gravity. Taylor (1981) proposed that two psychological variables that show a considerable influence on competitive performance are anxiety and self-confidence. Moreover, Martens, Vealey and Burton (1990) pointed out that those individual sport athletes that are judged in a subjective manner during competition show a high degree of cognitive anxiety and a lower self-confidence. On the other hand, some authors emphasize the importance of cognitive and emotional processes in the occurrence of injuries (Hackfort & Kleinert, 2007), where it has been shown that anxiety plays an important role (Olmedilla, Ortega, & Gomez, 2014).

The state of competitive anxiety is an immediate emotional state that includes feelings of being apprehensive, tension, and activation during competitive situations (Martens et al., 1990).

The anxiety that appears before a competition is known as pre-competitive anxiety (Cox, 2009).

Three dimensions have been identified in the competitive experience (Martens et al., 1990):

Cognitive anxiety, which refers to the mental component caused by a fear to social evaluation, failure, and loss of self-confidence (Cox, 2009); somatic anxiety which includes those physiological responses such as muscle tension, and self-confidence that refers to the perception of personal abilities and the belief to show an

adequate performance. Although this last dimension is not a direct measurement of anxiety, the pre-competition self-confidence is usually associated to low competitive anxiety (Craft, Magyar, Becker & Fletz, 2003).

Roberts (1986) established that personal meanings play a key role during the appearance of anxiety, and suggests that personal meanings related to achievement contexts, like in the case of sports, can function as disposition variables related to motivation.

Within this context, goal orientations would anticipate pre-competitive anxiety. Goal orientations are defined as the individual differences in the form of judging the competition or ability (Ames, 1992; Nicholls, 1989). Nicholls (1989) identified two types within his classic conception. The first one being an orientation to the task, in which the competition judgment is self-referenced. In other words, it is based on the level of mastery of the task that is being carried out. The second one is an orientation to the ego, in which the competition is judged based on normative criteria according to social comparison to others.

Roberts (1986) stated that athletes who are highly task oriented and with a low ego orientation, see the achievement in self-referred terms, and because of that they are less prone to experience an excessive state of anxiety. Some studies have supported this idea in a pre-competitive situation, like that conducted by Newton and Duda (1995) which showed that ego orientation predicted self-confidence in a negative manner. Hall, Kerr and Matthews (1998) stated that a day before the event ego and task orientations showed a significant correlation with self-confidence and that, 30 minutes before the competition task orientation held a negative correlation to somatic anxiety and self-confidence was predicted positively. Moreover, ego orientation had a positive correlation with cognitive anxiety. Pineda-Espejel and López-Walle (2012) were able to prove that ego orientation predicts somatic and cognitive anxiety, and that task

orientation predicts self-confidence positively as well as both anxieties in a negative manner. Ruiz-Juan and Zarauz (2013) supported for their entire sample, that ego orientation predicted cognitive anxiety positively.

Furthermore, different personality traits such as perfectionism, also anticipate the state of competitive anxiety (Cox, 2009). Recent approximations have defined perfectionism as a personality trait characterized by an effort of being impeccable and of establishing high standards of performance, also accompanied by a tendency to offer excessively critical assessments of one's conduct or performance (Flett & Hewitt, 2002).

Subsequent studies have suggested that there are two different dimensions of perfectionism (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Stoeber & Otto, 2006). The first dimension is called perfectionistic striving, which captures aspects or facets related to striving for perfection or establishing high standards of performance and excellence. The second dimension is known as perfectionistic concern which captures aspects associated to a concern for errors, doubts on the execution of tasks, and negative reactions towards imperfection.

There are not so many studies measuring both dimensions of perfectionism (perfectionistic strivings and perfectionistic concerns) with regards to the study of pre-competitive anxiety and perfectionism. For example, Frost and Henderson (1991) showed with university athletes that total perfectionism had a positive relation with pre-competitive anxiety and a negative relation with self-confidence. Hall and cols. in 1998 showed by studying student athletes that only the concern for errors (a facet of perfectionistic concerns) had a positive relation with anxiety and a negative one with self-confidence; whereas personal standards (a facet of perfectionistic strivings) had a positive relation with self-confidence. It is important to highlight that both studies focused on general

perfectionism and not perfectionism in sports.

In addition to this, Stoeber, Otto, Pescheck, Becker and Stoll (2007) in a study that included university and school athletes, as well as low performance football players; showed that total perfectionism was associated with high cognitive and somatic anxiety. Negative reactions to imperfection (a facet of perfectionistic concern) were particularly associated to high anxiety (cognitive and somatic) and held a negative relation with self-confidence in every group. However, the relationship between the strive for perfection (a facet of perfectionistic striving) and anxiety and self-confidence remained unclear. Besides, these results cannot be generalized in high performance cases.

Finally, Hamidi and Besharat (2010) conducted a study with different professional athletes, and found that a strive for perfection predicted cognitive and somatic anxiety in a negative manner and was positively related with self-confidence. In contrast, negative reactions to imperfection positively predicted somatic anxiety and had a correlation with cognitive anxiety and a negative correlation with self-confidence.

Even though previous research has focused on both dimensions of perfectionism (perfectionistic striving and perfectionistic concern), only two measured both variables in the sports context and in competitive situations; therefore this study focuses on the perfectionism in competition and makes the differentiation between both facets in perfectionism. These two facets are the striving for perfection and the negative reactions towards imperfection. This since there is proof that the striving for perfection represents the central element in the positive dimension of perfectionism (Stoeber & Otto, 2006). Furthermore, negative reactions to imperfection have been closely related to a concern for errors and a maladaptive perfectionism (Frost & Henderson, 1991; Rice & Preusser, 2002).

Based on these facts and since perfectionism is a common trait in high-

performance athletes (Gould, Dieffenbach & Moffett, 2002), the purpose of this study is to analyze how goal orientation and both facets of perfectionism (striving for perfection and negative reactions to imperfection) are associated with pre-competitive anxiety in elite gymnasts. Additionally, compare the variables through sex, and between best and worst teams positioned in the team final event.

METHODS

The sample consisted of 37 male and female artistic gymnasts participated in the study (15 male and 18 female, 4 did not report their gender). These athletes represented 57% of the population that competed in the 2014 Veracruz Central America and the Caribbean Games. The average age was 21.07 years ($SD = 4.45$), and reported having trained for 12.56 years ($SD = 5.73$), with a training range of 5 to 7 hours per day. These athletes represented different Spanish-speaking countries: Colombia, Costa Rica, Cuba, El Salvador, Honduras, Panama, the Dominican Republic and Venezuela). The male gymnasts obtained notes in the all around event between 88.150 and 70.100, while in the female branch the notes ranged were between 55.633 and 40.798.

We used the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda, 1989) to measure goal orientations in its adapted version for the Mexican context (López-Walle, Balaguer, Meliá, Castillo and Tristán, 2011). The questionnaire is composed of 13 items responding to the initial phrase "I feel the most successful in my sport when..." and it is divided in two scales measuring the orientation to the task (i.e. "I learn a new exercise and it makes me want to practice more") and the orientation to the ego (i.e. "I am the only one who can do such exercises or techniques"). Answers are on a five-point Likert scale which oscillate from *completely disagree* (1) to *totally agree* (5).

The striving for perfection facets and negative reactions towards imperfection in

competition were measured with a short version of the *Multidimensional Inventory of Perfectionism in Sport* (MIPS; Stoeber et al., 2007) adapted to Spanish (Pineda-Espejel, Alarcón, López-Walle and Tomás-Marco, in press). It is composed of ten items answering the initial phrase: "During the competition..." five of them capture the striving for perfection (i.e. "I have the desire to do everything perfectly"), and the other five capture the negative reactions to imperfection (i.e. "I feel completely furious if I make mistakes"). There was a Likert answer scale used which goes from *never* (1) to *always* (6). The global index of perfectionism during competition was calculated by combining the scores from the striving for perfection items and those of negative reactions to imperfection.

We used the Revised Competitive State Anxiety Inventory-2 (CSAI-2R; Cox, Martens & Rusell, 2003) in its version adapted to the Mexican context (Pineda-Espejel, López-Walle & Tomás, 2014) to analyze the intensity of pre-competitive anxiety symptoms. It is composed of 17 items responding to the initial question "How do you feel right now before the competition?" They are then grouped in three factors: somatic anxiety (i.e. "I am pretty restless"), cognitive anxiety (i.e. "I am worried about losing") and self-confidence (i.e. "I am confident enough to do well"). Answers were grouped on a four-point Likert scale oscillating from *nothing* (1) to *a lot* (4).

This present research was conducted according to the ethical directives proposed by the American Psychological Association (APA). Before proceeding to data collection, we requested via telematics for authorization from the General Office and the Technical Sports Deputy Office of the XXII Central America and the Caribbean Games 2014, as well as from the Mexican Gymnastics Federation to conduct the study. We had the support from the Deputy Office of Medical Services and Drug Control in order to have access to the competition facilities.

The first personal contact was with the trainers in order to inform them about the study and to request the participation of their gymnasts. In the case of under-age gymnasts, we requested participation consent from the trainer or team delegate. The application of the questionnaires was realized about 40 minutes before starting the warming up of the competition qualification session 1, in the presence of a pollster who is the main researcher, to answer any question regarding the comprehension of any item. Likewise, they were informed that by answering the questionnaires they were accepting their willful participation in the research. They were also informed about the fact that the data collected was to remain anonymous and confidentiality.

RESULTS

Descriptive Statistics and Reliability

The media, typical deviations, and data normality results for the study sample showed that, in average, these gymnasts report high levels of task orientation, perfectionism effort, overall perfectionism and self-confidence as well as moderate levels of ego orientation, negative reactions to imperfection and somatic anxiety (Table 1). The instrument reliability statistics (Table 1) reflected an adequate internal consistency by situating themselves above .70 criteria determined by the scales of the psychological domain (Nunnally, 1978).

Correlation and Linear Regression

Due to the normal distribution of data ($p > .05$), Pearson's bivariate correlations analysis showed that ego orientation is related to negative reactions to imperfection and with the global index of perfectionism. Cognitive anxiety was affected by the negative reactions to imperfection, whereas self-confidence was favorably influenced by task orientation (Table 1).

Table 1

Descriptive and variable normality statistics, reliability of scales (Cronbach Alpha), and Pearson's Correlations Matrix

	Rang	M	SD	W	1	2	3	4	5	6	7
1 Task Orientation	1-5	4.66	.43	.91	(.82)						
2 Ego Orientation	1-5	3.37	.85	.93	.18	(.81)					
3 Cognitive Anxiety	1-4	2.00	.60	.95	-.01	.01	(.81)				
4 Somatic Anxiety	1-4	2.15	.69	.95	-.01	-.17	.71**	(.85)			
5 Self-confidence	1-4	3.19	.58	.94	.42*	.24	-.18	-.36*	(.89)		
6 Striving for perfection	1-6	5.00	1.03	.97	.29	.30	-.06	-.06	.26	(.90)	
7 Negative reaction to imperfection	1-6	3.76	1.02	.92	-.13	.35*	.36*	.19	-.08	.02	(.81)
8 Global index to perfectionism	1-6	4.37	.73	.98	.11	.43*	.18	.08	.13	.71**	.71**

Note: * $p < .05$; ** $p < .01$. Reliability values are shown in parentheses (Cronbach alpha); *M* (mean); *SD* (Standard deviation); *W* (Shapiro-Wilk normality test).

Table 2

Differential analysis of the study variables between the best team and the lower team rank in the team final of WAG

	Countries rank	N	M	SD	F(d.f.)
Task orientation	2nd	4	4.85	0.14	4.00(6)
	4th	4	4.71	0.00	
Ego orientation	2nd	4	4.55	0.76	0.50(6)
	4th	4	4.00	0.60	
Cognitive anxiety	2nd	4	2.47	1.04	4.78(6)
	4th	4	2.04	0.41	
Somatic anxiety	2nd	4	2.40	1.21	10.28(6)*
	4th	4	2.60	0.20	
Self-confidence	2nd	4	4.14	0.84	0.41(6)
	4th	4	2.46	0.64	
Striving for perfection	2nd	4	5.40	0.40	7.84(6)*
	4th	4	5.00	1.56	
Negative reactions to imperfection	2nd	4	4.60	0.60	1.17(6)
	4th	4	4.26	1.20	
Total perfectionism	2nd	4	5.00	0.26	7.42(6)*
	4th	4	4.10	1.42	

Note: * $p < .05$

Based on correlation results, an analysis of linear regression was done disclosing that only task orientation predicts self-confidence ($\eta^2 = .52$, $p < .05$) explaining a 17% variance. Somatic and cognitive anxieties were predicted neither by goal orientation nor by any of the facets of perfectionism.

Differential analysis

The averages of the study variables were compared through sex. Student's t-test showed that women are more oriented on the task ($M = 4.81$; $SD = 0.25$) compared to men ($M = 4.38$; $SD = 0.54$) [$F = 7.87$ (31), $p < .01$]. While for the remaining variables there were no statistically significant differences.

In addition, were compared the averages of two teams of the sample, the best against the lower ranked at the team final, both WAG and MAG. The Student's *t*-test revealed, for WAG, significant differences in levels of somatic anxiety, striving for perfection, and global index of perfectionism, being the best team that showed fewer somatic anxiety, and more positive perfectionism (Table 2). While the two teams MAG were not significant differences.

DISCUSSION

This work was done in order to analyze how goal orientation and two facets of perfectionism (striving for perfection and negative reactions to imperfection) are associated with precompetitive anxiety in high performance gymnasts.

It has been found that these elite gymnasts demonstrate high perception of self-confidence, and moderate levels of intensity in the symptoms of anxiety, opposing the theoretical assumptions of Martens and cols. (1990) for practitioners of these sports. This result can be attributed to the high level of performance of this sample, suggesting that have past experiences of competition, and are familiar with the situation (Drévillon, 1999). In contrast, is related with exposed by Allen, Greenlees, & Jones (2011), respect to athletes competing in international competitions have been found to have lower levels of neuroticism (incorporating anxiety).

For these levels of self-confidence and anxiety prior to competition, on one hand, the results support that anxiety is a function of personality (Rivolier, 1999). Particularly, if a gymnast is defined competent mostly through effort, learning and mastery execution of technical elements, this predicts expressions of high level of confidence in their ability before the competition and makes them believe that they are able to perform the gymnastic techniques just as they trained for; agreeing with previous studies using samples of

different athletes, and another level of performance (e.g. Hall et al., 1998; Pineda-Espejel & López-Walle, 2012).

This result maybe because these gymnasts maintained a high task orientation and a moderate ego orientation, they perceived the achievement in more personal terms, such as Roberts (1986) pointed out they are less likely to experience excessive worry and / or tension before the competition. The results support the idea of Craft et al (2013) that self-confidence before the competition is usually associated with low competitive anxiety; the reason is that self-confidence favors focusing on their strengths rather than their errors, and intensifying their efforts in order to achieve their objectives (Tognetti & Reda, 2004), such as showing sports mastery.

On the other hand, the results shown that if a gymnast feels competent only if shows to be superior to other gymnasts, then it is possible that when it fails in a motor gesture technique during competition, then bothers or frustrates himself/herself, and this leads to that prior to the competition, the gymnast has higher negative images and thoughts about their performance, which may arise feelings of worry, fear or insecurity of their performance capabilities, or failure to comply with their established achievement standards, leading to attention difficulties (Burton, 1988). This result agrees with the study of Hamidi and Besharat (2010) with high performance athletes, as well as the study of Stoeber et al (2007) with lower performance athletes.

The main effect of this condition is impotence and inability to properly perform their gymnastic skills and techniques. This supports the idea that the facet of negative reactions to imperfection resulting in a maladaptive perfectionism, furthermore, when the gymnast makes a mistake and reacts negatively to such imperfection of execution, it usually turns into distraction and uncertainty for the rest of the routine.

Although there is some evidence that striving for perfection may be related to precompetitive self-confidence (e.g. Hamidi & Besharat, 2010), and that negative

reactions to imperfections relate to somatic anxiety and inversely with self-confidence (e.g. Hamidi and Besharat, 2010; Stoeber et al., 2007), such relations were not significant in this study, probably due to the small size of the sampling; however, these associations keep the theoretical sense, since the negative reactions to imperfection have a negative tendency on self-confidence; while striving for perfection has a positive tendency on self-confidence and inversely with anxiety.

In this sense, the relationship between striving for perfection and precompetitive anxiety and self-confidence is unclear, as in the study of Stoeber and cols. (2007). However, it helps to reinforce that when effort perfectionist and doubt perfectionist are differentiated through its facets (e.g. striving for perfection and negative reactions to imperfection) only negative reactions to imperfection are related positively to precompetitive cognitive anxiety.

Moreover, because there is evidence that women can manifest more anxiety than men (e.g. Martens et al., 1990), the means of the study variables were compared between men and female gymnasts, showing that do not differ in levels of anxiety or self-confidence, consistent with other studies (e.g. Guillen & Alvarez-Malé, 2010; Montero, Moreno-Murcia, Gonzalez Pulido & Cervello, 2012). However, women consider a greater extent than men, which the main cause of success in sport comes from the effort.

In addition, since there are approaches that compare personality scores between athletes of low and high level, in this study make differential analysis of the means of the variables between two teams. It is noted that in the women, the best ranked team strives more to make perfect routines, and have lower levels of physiological arousal and the symptoms that this entails (e.g. sweating in the hands, muscle tension) compared with the equipment ranked in lower position. It is clear that both variables put in advantage the best ranked team, as the striving for perfection tends to favor

them feel successful when they show sports mastery, and this increases the self-confidence under pressure, and thus the perception of ability (Besharat & Pourbohloul, 2011). However, in the male branch no significant difference between the two teams, which does not make clear the role of the variables on performance.

Among these findings, the high average of striving for perfection in comparison to the moderate average of negative reactions to imperfection, supports what was indicated by Gould and cols. (2002) regarding to adaptive perfectionism, which is being represented by the facet of striving for perfection, has been identified as a psychological feature of high performance athletes. We consider that the characteristics of high performance gymnastics influence gymnasts to strive for perform perfect routines, because this sport define ideals performances and forms of realization referenced; since the men take the initiative to improvement new motor skills, while women are more consistent and responsive to the technical details (Issurin, 2012). Coupled with that the apparatus are an artistic performance where participants have a very limited time to get their classification after that time it is no longer possible to make corrections, which entails the rendition of high difficulty elements with impeccable technique.

In the other hand, the fact that striving for perfection and negative reactions to imperfection are not relate in this sample means that gymnasts, who strive to perform routines with excellence during the competition, are not likely to react negatively when they fail to achieve perfect performances. This suggests that perfectionism in high performance artistic gymnastics can be adaptive in those who strive for perfection, but control their negative reactions when their performance is not perfect.

This work has important implications for understanding perfectionism in high performance artistic gymnastics as well as for reasoning some correlatives that anticipate precompetitive anxiety, as the

competition is preferably centered on the social contrast and subjective and objective assessment of individual skills, and is a situation where the gymnast must face facts that time, the results and, on many occasions, the consequences of their performance can determine their future as a gymnast (e.g. leave the headline team, to be part of a selection), generating uncertainty about the likely outcomes.

From the theoretical point of view, it provides information about the contribution of perfectionism and goal orientations on precompetitive anxiety. The results support that perfectionism is multidimensional, and that only facet of negative reactions to imperfection has negative effects. Consequently, only certain forms of perfectionism are associated with pre-competitive anxiety.

Secondly, this work used the CSAI-2R to measure pre-competitive anxiety, unlike most of the studies mentioned here that used CSAI-2, which showed low factorial validity (Cox et al., 2003), therefore helps to clarify the relationship between the dimensions of precompetitive anxiety and perfectionism in competition. It is also a research that provides information of personality on high performance to the existing literature.

From a practical point of view, supports that personality has a lot of predictive utility in sport, and provides that it is favorable that the gymnasts feel successful mostly when they master a technical element, and to strive to make the technical elements and gymnastic routines with impeccable execution technique (exacerbating punctuality, perseverance and obstinacy during training), because it helps to trust your skills before the competition, which opposes the excessive increase in physiological arousal. In contrast, gymnasts should control feelings of dissatisfied, angry or frustrated when you do not run the routines perfectly, since increasing these reactions lead to worry, fear and insecurity of their efficiency; and those doubts finally create anxiety (Weinberg & Gould, 2010). From a diachronic view, precompetitive

anxiety can manifest in the physical plane with injuries such as sprains or tendinitis during training, and the mental plane with emotional block immediately before the competition (Rivolier, 1999), which undermines self-confidence.

And it provides information on how personality can affect gymnasts' responses to a competition. Then this information has important implications for sport psychologists design interventions whose goals are the constructs of this research, and the development of emotional control strategies, which further contribute to sporting conduct before the competition (e.g. attentional processes). In addition, understanding the personality can help coaches identify gymnasts require great support during competitions and major events in his career.

There are also some limitations in this study, such as having measured only two facets of perfectionism, striving for perfection and negative reactions to imperfection (Stoeber et al., 2007). It is therefore important that future studies employ different multidimensional measuring of perfectionism in sport and research other positive and negative aspects of perfectionism. Another limitation was the small sample size, making it impossible to generalize the results to the sport, or to the same level of performance. Therefore, further studies should be conducted with larger samples of high performance gymnasts.

Since anxiety and performance are closely linked, another limitation was not having assessed the athletic performance of each gymnast, so that was related to the variables under study. In addition, it would be important to include in future studies the direction dimension of anxiety, ie, how gymnasts perceive symptoms precompetitive anxiety, whether as beneficial or disturbing agents for their performance in competition (Jones, 1995), so that you can supplement information on whether a specific anxiety level will allow you to perform better or not; although there are unsupportive studies to evaluate the

directional perceptions of anxiety (e.g. Jerome and Williams, 2000).

Finally, this work has used a partnership approach between personality and precompetitive anxiety, however, the sport involves social interaction, so that behavior is influenced by the environment, such as organization and discipline; therefore it has been lacking assess the social context, considering that the high performance athletes, in his field evolution is more directly subjected to social pressure (Drévillon, 1999). So the assessment of the role of the environment (e.g. coach) as a predictor of anxiety in athletes (Rivolier, 1999) is another future line of research.

Based on the results of this study, we can conclude that aspects of personality, such as task orientation and negative reactions to imperfection can anticipate higher levels of self-confidence and cognitive anxiety, respectively, in the previous moments of a competition of high-level artistic gymnastic.

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