

PSYCHOMETRIC PROPERTIES OF AN INSTRUMENT FOR ANALYZING NEGATIVE STEREOTYPES AGAINST INJURED ATHLETES

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ABSTRACT

This study was planned with the purpose of investigating the psychometric properties of an instrument developed to know the content of the stereotypes about injured athletes. Prior studies have shown that stereotypes can influence people behavior when they perform their duties if activated. Positive stereotypes also tend to improve the productivity of people in a given task, whereas the activation of negative stereotypes leads to a worsening of the results, including the performance of athletes. Participants were 226 people; questionnaire was used to assess both negative and positive aspects about injured athletes. Those data were examined through an exploratory factor analysis, a confirmatory factor analysis, the Pearson correlations between items and between the factors and the internal consistency using Cronbach's alpha. Considering the limitations of a study based on samples and the exploratory nature of this research, the instrument has presented acceptable values for internal consistency, correlation between factors and content validity. Nevertheless, this scale should be improved to reach better values of internal consistency that has been only satisfactory. Although, the Cronbach's alpha found for the whole instrument and for 2 of the factors are above the recommended 0.70, 2 other factors in this trial barely exceeded .50.

Keywords: Psychometric properties, Stereotypes, injured athletes, negative stereotypes and positive stereotypes.

INTRODUCTION

Stereotypes are shared beliefs regarding the general conduct of a certain group of people, their personality traits and other attributes (Dovidio, Hewstone, Glick, & Esses, 2010; Freire & Pereira, 2009; Hamilton, Stroessner, & Driscoll, 1994; Leyens, Yzerbyt, & Schadron, 1994; Moore, 2002; Rodrigues, Assmar, & Jablonski, 1999; Tajfel, 1982). The term originated in the press, since it was first used by Lippmann (1922), a journalist and political commentator. His research study focused on the influence of stereotypes on behavior. Since then, it ended up meaning "all that is repeated according to a standard model." In general, stereotypes are formed by preconceived and simplified ideas, due to the lack of real knowledge on a subject, a person, a fact, a social or ethnic group (Melhoramentos, 2009).

In the research field of the stereotypes, one area of interest is the change that occurs in people when they perform their duties upon activation of stereotypes. Activating a stereotype is increasing accessibility of the constellation of attributes that are believed to characterize members of a given social category (Singletary, Ruggs, Hebl, & Davies, 2009; Wheeler & Petty, 2001, p. 797) through words, pictures or other stimulus. One can mention the example of the classic experiment of (Levy, 1996). Some words that would activate positive stereotypes about older people were presented to a group of elders (wisdom, experience); while another group was presented with words that would activate negative stereotypes (old, senile). Then the two groups undertook a memory test, and it was observed that the result of the first group was better than the second. Researches such as this suggest that the activation

of positive stereotypes tends to improve the productivity of people in a given task; whereas the activation of negative stereotypes leads to a worsening of the results.

Another line of research relates to the effect that stereotypes can cause on the performance of athletes. The best known are related to the Stereotype Threat Theory (Steele & Aronson, 1995) which were carried out by Stone, Lynch, Sjomeling, & Darley (1999). According to this theory, people who identified with a social group which has a negative stereotype known to all, and are capable of fulfilling their daily tasks, suffer a drop in performance when attempting to accomplish this tasks after the given stereotype is activated. Further studies demonstrated that the negative stereotypes for Caucasian and African descent athletes caused a decline in physical performance of the stereotyped group subjects, by activating the corresponding stereotype before they played golf (Stone et al., 1999). In other words, Caucasians performed worse when the task was presented as a test of athletic ability and better when presented as a test of mental ability. With African descents, the opposite was true.

In general, studies on the threat of stereotypes have been devoted to observing the effects of the activation on the intellectual activities. From Stone et al. (1999), other researchers continued to develop work in this direction (Chalabaev et al., 2013; Feltz, Schneider, Hwang, & Skogsberg, 2013; Follenfant, Légal, Marie Dit Dinard, & Meyer, 2005; Freire & Pereira, 2005; Hively & El-Alayli, 2014), confirming the idea that the activation of negative stereotypes about a group of people can, in many cases, decrease the performance of members of this group when requested to meet a physical task.

Similar effect was observed when (Freire & Pereira, 2005) working with soccer players, and activated the stereotype for injured athletes, before measuring the maximum height reached in a vertical jump. Players, who had been injured and went through the activation of the stereotype, although fully recovered, performed worse. This effect was not observed in the players who had not been injured, neither in those who did not go through the activation of the stereotype (injured or not). The results of the study by Freire and Pereira (2005) suggest that there is a stereotype for the group of injured athletes, a negative one, and which may reduce performance in a physical activity. This research aims to develop an instrument to know it.

Literature review, however, reinforces the idea that the stereotype about injured athletes should be a negative one, as Roderick (2006) demonstrated in a survey with English professional football players. He found results that suggest that athletes' self-image are altered when they are injured or are in pain, especially at times when it is necessary to fight for a place on the team. This study demonstrates that a player's temporary downturn for the sake of pain or injury creates a negative effect in the workplace, similar to that observed when a regular worker retires after working for years in any other area. Abandoning work is not acceptable, even for health reasons. A difficult and delayed diagnosis, for instance, can cause a person - athlete or not - to be known as "inactive" or as that which "simulates" an injury to avoid work, creating a negative stereotype of the injured group. The fact that pain is considered as inherent to sports may result in specific situations and feelings on affected athletes.

This study was planned with the purpose of investigating the psychometric properties of the instrument developed by Freire & Pereira (2005), which concerns the negative content of the stereotypes about injured athletes, aiming at eliminating items and create a reduced version to be used in future studies. To do so, the structure will be examined through an exploratory

factor analysis, a confirmatory factor analysis, the Pearson correlations between items and between the factors and the internal consistency using Cronbach's alpha.

METHOD

Population and Sampling

In total, there were 226 people, all Brazilians, of which 131 were male and 95 were female. The age range was between 13 and 59 years old ($M = 24.5$, $SD = 9.3$). The sample size exceeds the minimum number of five participants for each question in the questionnaire, as suggested by Tabachnick & Fidell (1989).

Instrument

The instrument used was the online version of the questionnaire developed by (Freire & Pereira, 2005), consisting of 36 questions, arranged in a Likert scale with 5 levels, where 1 represented total disagreement and 5 total agreement.

The questionnaire attempted to assess the negative stereotypes about disabled athletes (questions 03, 06, 11, 19, 20, 22, 24, 26, 29 and 32) and positive aspects (13, 18 and 30). Some of the questions had been developed to analyze the behavior of certain categories towards the injured athletes (04, 21, 25, 28, 33 and 36), and the other part to the attribution of damages caused by injury, both physical and psychological (02, 14, 17, 23, 27 and 31).

It was thought wise to vary the manner of presentation of some questions (05, 07, 09, 16, and 35) due to linguistic difference in the expression of stereotypes, distinguished by (Maass, Salvi, Arcuri, & Semin, 1989). This difference is based on the model of linguistic categories of (Semin & Fiedler, 1988). According to these authors, stereotypes are more powerful when expressed by adjectives, rather than a verb. Thus, different results were expected; for example, to the statements "injured athletes are anxious (03)" and "injured athletes have anxiety (35)".

To complete the instrument, there were questions about injuries that have functioned as distracters, since they don't directly mention the belief in the injured group. They are: stretching prevent injury (01), athletes compete when injured (08), one cannot prevent injuries (10), every athlete risks suffering a serious injury during his career (12), every athlete will suffer at least one serious injury during his career (15), it is usual for an athlete competing in pain (34).

Procedures

A lot has decided the order of the questions and the invitation to the participants was made through online social networking. Everyone should visit the website where the questionnaire was found and answer the questions, which intended to ascertain the beliefs of the injured athletes. It was sought to work with a composite sample, formed by convenience, consisting of people of either sex, over a wide age range, including both people directly involved with the sport and people not involved with it. The only requirement was that the participants knew the language in which the instrument was written, which is Brazilian Portuguese.

RESULTS

Most of the asymmetry rates are close to zero and between -0.74 and 0.62, as well as the kurtosis, which are between -0.98 and 0.71, indicating similarity to the normal curve; although some items represent a departure from the normal distribution kurtosis ("the injured athletes are losers").

Exploratory Factor Analysis

To remove items from the initial instrument, consisting of 36 statements, and create a smaller version, it was sought to estimate the number of factors and the percentage of variance explained through an exploratory factor analysis (EFA) of principal components and varimax rotation. This rotation was chosen because it was assumed that the factors were orthogonal, which means they were not correlated. The results indicated a structure of 13 factors with eigenvalues greater than unity (Kaiser, 1960) and which explained as a whole 66.67% of the variance. The results are shown in Table 1. The KMO index was also calculated, which is .70, and the amount of variance, measured by the Bartlett test, $<.001$.

The first factor found relates to the low value given to injured athletes and the belief that they are losers. Next, is the idea that presidents of clubs and investors bother to support them, either by hiring or investing in them. The positive adjectives come together in factor 3 and two distracters occur in factor 4. The next factor is related to these athletes' fear and anxiety, while factors 6 and 7 deal with the psychological influence on the injuries. The physical influence appears later, immediately before the belief attributed to the players that act alongside an injured one.

In position 10, are grouped items concerning loneliness; in 11, is the negative stereotype that the injured ones feel useless, followed by the fatalist statement that "every athlete will suffer at least serious injury during his career." The penultimate factor in the table refers to the adjective "fearfully" and failure to regain pre-injury performance. The last factor is just the distracter "cannot prevent injuries."

The results show that the top 5 categories of questions, as described, have been subdivided into 13 factors. Even then, the criteria for this separation remained as reliable as the original. An example of this is in the 6 items concerning the behavior of people towards injured athletes: statements about presidents of clubs and investors have been grouped in factor 2, while the ones referring to the players go into the factor 9, as shown in Table 1. There was a similar move in other sorts of questions.

After analyzing the factorial weight between each of the 36 questionnaire items and the factors, and the ones with less than 3 items were eliminated, as well as those with very low saturation. We adopted the cutoff suggested by (Bowling, 1997) in the context of the validation instruments. According to him, one must delete all items in which the correlations with the factors (factor loadings) are below 0.55. It was also sought to give more reliability to the instrument and so the items whose internal consistency was $>.70$ (Muñiz, 1996) were selected: 3, 6, 7, 11, 16, 19, 21, 22, 24, 26, 28, 32, 33, 35, 36.

The *Scree Plot* diagram in Figure 1 suggests the use of four factors, since the already explained variance will not contribute significantly thereafter. The new 4 factors have been labeled with the names of "uncomfortable", consisting of items 21, 28, 33 and 36, "value", items 11, 19, 22, 24 and 26; "feature", items 3, 16, 7 and 35 and "recovery", items 6 and 32.

Figure 1: Scree Plot Diagram

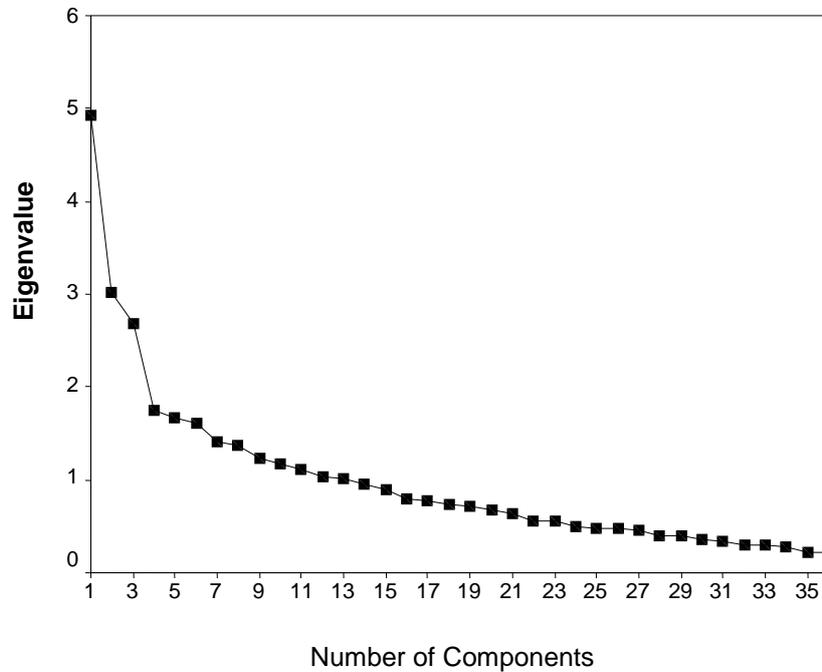


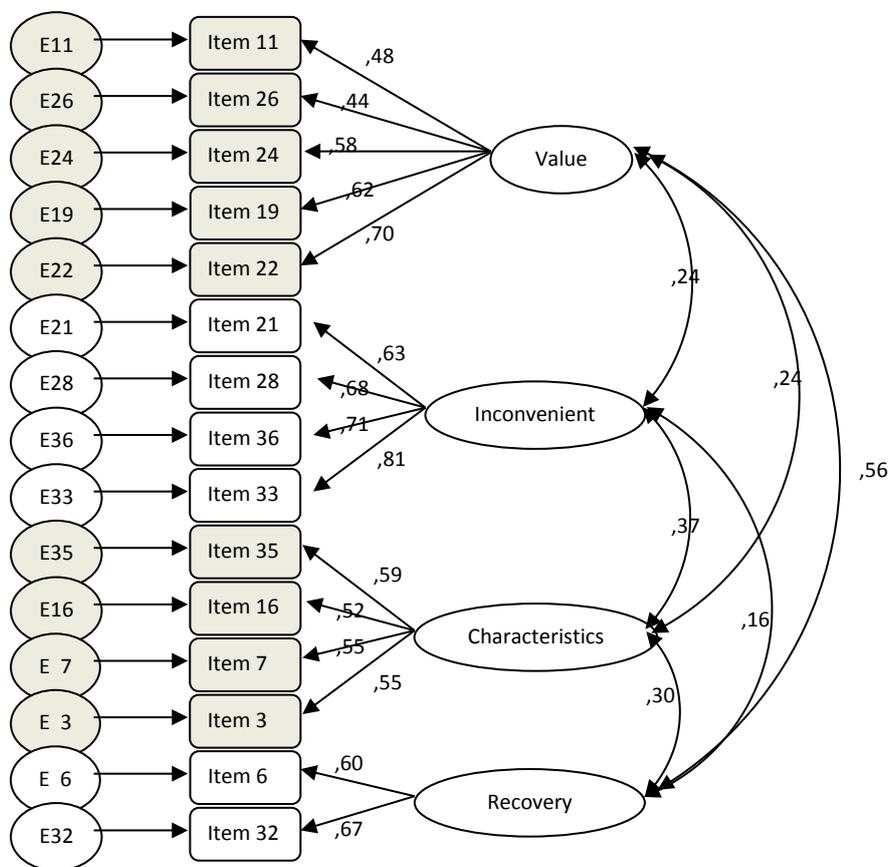
Table 1: Exploratory Factor Analysis of Components with Varimax rotation

	1	2	3	4	5	6	7	8	9	10	11	12	13
22) Injured athletes are worthless to their team		,725											
19) Injured athletes are worth less to their team		,674											
24) Injured athletes are losers		,613											
20) A serious injury is a significant reason to end the career of an athlete		,592											
11) Injured athletes are useless		,590											
33) Presidents of clubs are uncomfortable in signing athletes who were sidelined for a long time due to injury						,804							
36) Investors are uncomfortable in supporting an athlete recovering from a serious injury						,755							
28) Investors are uncomfortable in supporting an athlete who was sidelined for a long time due to injury						,700							
21) Presidents of clubs are uncomfortable in signing athletes recovered from serious injuries						,697							
18) Injured athletes are confident							,797						
9) Injured athletes feel believed							,746						
13) Injured athletes are winners							,659						
30) Injured athletes are optimistic							,567						
34) It is usual for an Athlete to compete in pain							,796						
8) Athletes compete when injured							,785						
35) Injured athletes have anxiety							,778						
3) Injured athletes are anxious							,761						
7) Injured athletes are scared							,502						
31) The drop in the performance of an athlete who is seriously injured is of psychological origin							,886						
23) The drop in the performance of an athlete who was sidelined for a long time is of psychological origin							,813						
17) Psychological factors play an important role in the recovery from an injury.								,752					
27) A psychologist plays an important role in the recovery from an injury								,644					
1) Stretches prevent injuries								,569					
14) The drop in the performance of an athlete who is seriously injured is of physical origin									,821				
2) The drop in the performance of an athlete who was sidelined for a long time is of physical origin									,816				
4) Players are annoyed when there is an athlete recovering from serious injury in the team										,808			
25) Players are annoyed when there is an athlete on the team who was sidelined for a long time due to injury										,692			
12) All athletes risk a serious injury during their career											,684		
29) Injured athletes are lonely											,613		
16) Injured athletes feel lonely											,505		
5) Injured athletes feel useless												,766	
15) All athletes will suffer at least one serious injury during their career												,517	
6) An athlete who was sidelined for a long time due to injury will never regain their previous performance													,698
26) The injured athletes are fearful						,478							,498
32) An athlete severely injured will never regain the pre-injury performance													,476
10) It's not possible to prevent injuries													,820

Confirmatory Factor Analysis

In the following, a confirmatory factor analysis (CFA) was performed to test the dimensional structure underlying the questionnaire using AMOS 7.0. The analysis was carried out as suggested by Hair, Anderson, Tatham, & Black (2005). Figure 2 shows the absolute measures of fit and the path of the CFA. The fit indices were the chi-square ($\chi^2 = 44.27$, 84 degrees of freedom), the GFI = 0.93, IFI = 0.91, CFI = 0.91 and RMSEA = 0.59. To be considered acceptable, the GFI, IFI and CFI values should be equal to or greater than .90 and the RMSEA value should be less than 0.08 (Sandin, Santed, Chorot and Valiente, 1996). These statistical values support the belief that the fit between the 15 items and 4 factors is acceptable.

Figure 2: Diagram of the Path of the Confirmatory Factor Analysis.



Chi Squared = 44.27, SD = 84, Variability = 0.999,
 Root Mean Square Error of Approximation (RMSEA) = 0.59
 Goodness of Fit Index (GFI) = 0.93
 Incremental Fit Index (IFI) = 0.91

Pearson correlations

Pearson's Correlation Coefficient and corresponding items are found in Table 3. As simply shown, there is no statistically significant correlation between the standardized score of the factors "inconvenient" and "recovery." The identified positive correlations suggest that all factors of the scale "walk in the same direction" and that strengthens the idea that the system of questions does resemble a scale. It is appropriate to note that although significant ($p < 0.05$) correlations between the factors "inconvenient" and "value", "value" and "characteristic" and "characteristic" and "recovery" may be considered weak (Franzblau, 1958).

Reliability Analysis

We also calculated the internal consistency according to Cronbach's alpha for both the set of all questions related to the questionnaire and the questions related to each factor, in order to investigate the reliability of the instrument.

The examination of the data in Table 4 shows that all values of Cronbach's Alpha for the items and factors are 0.50 higher (cut-off point suggested by (Bowling, 1997), however not all of them reach the recommended value, which is 0.70 or higher, to be considered that the group of items make a scale (Pasquali, 2003). Therefore, the values certify satisfactory internal consistency for the instrument ($\alpha = .755$) and for the factors "inconvenient" ($\alpha = 0.796$) and "value" ($\alpha = 0.692$), while the factors "characteristic" and "recovery" are not reliable enough, according to these criteria.

Table 2: Pearson's Correlation for the 4 factors and 15 items

	q21	q28	q33	q36	q11	q19	q22	q24	q26	q3	q7	q16	q35	q6	q32	1	2	3	4	
q21	1	.43(**)	.52(**)	.42(**)	.01	.14(*)	.11	.02	.18(**)	.11	.18(**)	.21(**)	.04	.06	.08	.75(**)	.14(*)	.20(**)	.08	
q28		1	.54(**)	.50(**)	.05	.17(*)	.12	.05	.26(**)	.11	.21(**)	.21(**)	.02	.04	.00	.78(**)	.20(**)	.20(**)	.03	
q33			1	.58(**)	-.00	.14(*)	.09	.05	.18(**)	.17(*)	.18(**)	.22(**)	.11	.09	.08	.83(**)	.15(*)	.25(**)	.10	
q36				1	-.08	.12	.18(**)	.08	.22(**)	.11	.20(**)	.16(*)	.15(*)	.13	.07	.79(**)	.16(*)	.22(**)	.12	
q11					1	.41(**)	.30(**)	.21(**)	.20(**)	.10	.13	.05	.03	.15(*)	.20(**)	-.01	.63(**)	.07	.21(**)	
q19						1	.46(**)	.27(**)	.25(**)	.11	.16(*)	.12	.00	.24(**)	.14(*)	.18(**)	.75(**)	.14(*)	.23(**)	
q22							1	.44(**)	.23(**)	.11	.13(*)	.05	.02	.28(**)	.25(**)	.16(*)	.70(**)	.12	.32(**)	
q24								1	.40(**)	.05	.06	.01	-.05	.24(**)	.29(**)	.07	.65(**)	.03	.31(**)	
q26									1	.26(**)	.28(**)	.17(*)	.12	.02	.18(**)	.26(**)	.63(**)	.30(**)	.12	
q3										1	.27(**)	.19(**)	.45(**)	.00	.12	.16(*)	.16(*)	.72(**)	.07	
q7											1	.36(**)	.26(**)	.10	.12	.25(**)	.24(**)	.67(**)	.13	
q16												1	.29(**)	.16(*)	.13(*)	.25(**)	.12	.67(**)	.18(**)	
q35													1	.04	.170(*)	.10	.04	.70(**)	.12	
q6														1	.40(**)	.10	.27(**)	.11	.84(**)	
q32															1	.07	.30(**)	.19(**)	.83(**)	
Inconvenient																1	.20(**)	.28(**)	.11	
Value																	1	.21(**)	.34(**)	
Recovery																		1	.18(**)	
Characteristics																				1

Table 3: Cronbach's Alpha Reliability Coefficient of the factors

Item	Cronbach's Alpha	Number of factors/items
Inconvenient	.80	4
Value	.69	5
Characteristics	.63	4
Recovery	.57	2
Scale	.76	15

DISCUSSION OF FINDINGS

Within the appropriate limitations of a study based on samples and considering the exploratory nature of this research, the instrument has presented acceptable values for internal consistency, correlation between factors and content validity. The internal consistency has been only satisfactory because although the Cronbach's alpha found for the whole instrument and for 2 of the factors are above the recommended 0.70, 2 other factors in this trial barely exceeded 0.50.

Although, the correlation between factors includes those with low magnitude, all of them have proved positive and statistically significant, which ensures a good level for the correlation between the items in this scale. Content validity was established through the appropriate random sample and the original data, which were adapted to the structure of 4 factors, ascertained by confirmatory factor analysis.

Despite not being able to verify other topics, such as the reliability of the test-retest, or to assess the criteria validity or discriminant of the scale, the results show that the instrument does work and is an option to study stereotypes for sports injuries in this population. However, it is clear that new tests and studies are needed to achieve the recommended rates. Therefore, the quality measures and overall fit give us enough support to believe that the results represent, in an acceptable manner, the constructs studied.

In relation to the correlation between the scale factors ("inconvenient", "value", "characteristics" and "recovery"), positive correlation was found to exist among the scale factors, which characterizes the construct validity of the instrument. The most related factors were "characteristic" and "recovery" while the least related have been "inconvenient" and "recovery."

CONCLUSION

Despite the absence in this study of psychometric properties ideal for a scale, it can be noticed that this tool provides a positive outlook, and if it continues to develop, it may be useful in identifying stereotypes of athletes who have been injured. It is possible that factors such as the participants' commitment to sport, or age, are capable of causing significant impact on the results, which is something to be taken into account when further developing the survey. This implies that the instrument was considered to be good but with chances of improvement.

It is acknowledged that this is a preliminary study and it is necessary to submit the instrument to other tests to verify its properties, and achieve more conclusive results.

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