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ORIGINAL

CAUSES OF SUCCESS IN HANDBALL THROUGH THE BELIEFS ABOUT ABILITY

CAUSAS DEL ÉXITO EN BALONMANO A TRAVÉS DE LAS CREENCIAS SOBRE HABILIDAD

Gómez-López, M.[1]; Manzano-Sánchez, D.[1]; Merino-Barrero, J.A.[2]; Valero-Valenzuela, A.[1]

[1] Department of Physical Activity and Sports. University of Murcia (Spain) mgomezlop@um.es, david.manzano@um.es, avalero@um.es

[2] Facultad de Educación. Universidad Internacional de La Rioja (UNIR), Logroño (Spain) jandres.merino@unir.net

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Spanish-English translator: Sheila Lindo Martínez, sheilalinma@gmail.com

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ABSTRACT

The aim of this study was to determine the prediction ability of the implicit beliefs about ability over the beliefs about the causes of success in sports. The sample was comprised of 444 high performance athletes (233 boys and 211 girls; M = 16,70; SD = 0,49). These athletes completed the Spanish version of the Beliefs

about the Causes of Success in Sports Questionnaire and the Conceptions of the Nature of Athletic Ability Questionnaire-2. The results revealed that beliefs of incremental ability predict effort, while beliefs about ability as an entity predict ability and deception as causes of success in handball.

KEYWORDS: coach, incremental belief, entity belief, deception

RESUMEN

El objetivo fue determinar la capacidad de predicción de las creencias implícitas de la habilidad sobre las creencias de las causas del éxito en el deporte. La muestra estuvo compuesta por 444 deportistas de alto rendimiento (233 chicos y 211 chicas; M = 16,70; DT = 0,49). Estos deportistas cumplimentaron el Inventario de Percepción de las Creencias sobre las Causas del Éxito en el deporte y la Escala de Creencias Implícitas sobre la Habilidad. Los resultados reflejaron que las creencias de habilidad incremental predicen el esfuerzo, mientras que las creencias de habilidad como entidad predicen la capacidad y el engaño como causas del éxito en balonmano.

PALABRAS CLAVE: entrenador, creencia incremental, creencia de entidad, engaño

INTRODUCTION

Recent researches show that the sporting environment is an ideal place to achieve positive consequences through physical activity (Jõesaar & Hein, 2011). It is essential to obtain these benefits taking into account the motivational aspects, which are relevant to understand the behaviour of human beings (King & McInerney, 2012).

One of the theories that explains motivation is the achievement goal theory (Nicholls, 1989), which states that athletes act motivated by the need to show their competence and to avoid demonstrating otherwise. In team sports with top-flight athletes, those who claim to be very task-oriented achieve a better competence as well as more self-determined levels of motivation (Fernández, Cecchini, & Méndez, 2017).

Focusing on handball, there are several recent studies that have been carried out connecting different psychological variables with motivation (Gómez-López, Granero-Gallegos, Baena-Extremera, & Abraldes, 2014; Ruiz-Sánchez, Gómez-López, & Granero-Gallegos, 2017; Ruiz-Sánchez, Gómez-López, Granero-Gallegos, & González-Hernández, 2017). Researches such as that of Li et al. (2011) show that those athletes with higher values of task-orientation are also those with higher competitive level and intrinsic motivation as well as greater

enjoyment, in contrast to the group with a greater degree of ego involvement. Literature has shown that goal orientations are good predictors of beliefs about the causes of success in sports, both in collective sports (Usán, Salavera, Murillo, & Álvarez-Medina, 2017; White, Kavussanu, Tank, & Wingate , 2004), and in individual sports (Abraldes, Gómez-López, Granero-Gallegos, & Rodríguez-Suárez, 2013; Abraldes, Granero-Gallegos, Baena-Extremera, Gómez-López, & Rodríguez-Suárez, 2016; Mascret, Falconetti, & Cury, 2016; Ruiz-Juan, Gómez-López, Pappous, Alacid, & Flores, 2010). Meanwhile, the ego orientation is more related to the perception of the causes of success in sports through the use of deception. On the contrary, the task orientation is related to effort and personal ability as the main causes of success in sports. More specifically in handball, studies such as that of Granero et al. (2017) indicate that a task orientation is related to the belief in effort as a means to achieve sporting success, while an ego-oriented environment is more related to beliefs about ability and deception.

Another important factor related to the motivation of adolescents in sports is implicit beliefs about sports ability (Li & Lee, 2004), which exert a strong influence on behaviour. Athletes can conceive ability as something improvable through learning, effort and training (incremental belief), or as something innate and stable, and therefore independent of both practise and effort (entity belief) (Biddle, Wang, Chatzisarantis, & Spray, 2003). Spray, Wang, Biddle, Chatzisarantis and Warbuton (2006) claim that ability is influenced by an innate natural talent that can be modified through effort and training.

In this regard, different studies show that the incremental belief about ability is positively related to more self-determined ways of motivation, enjoyment, persistence and goal orientations to mastery. On the other hand, athletes with a belief about ability as stable experience feelings of frustration and demotivation at the moment of not achieving satisfactory results (Li, Lee, & Solmon, 2005).

Consequently, there are numerous research papers which relate the motivational climate and the beliefs of sporting success (Abraldes et al., 2016; Cordo-Cabal, Gómez-López, & Granero-Gallegos, 2019; Laparidis, Papaioannou , Vretakou, & Morou, 2003; Mascret, Falconetti, & Cury, 2016; Usán et al., 2017), or the motivational climate and the implicit beliefs about sports ability (Cury et al., 2002; González-Cutre et al. al., 2007; Li et al., 2005; Ommundsen, 2001).

Along these lines, Nicholls (1992) considers that the implicit conceptions or beliefs about ability are related to the understanding by the individuals of the differences between ability and effort (beliefs of the causes of success), considering that a stable conception of ability represents the belief that ability cannot be modified with effort, and the performance depends on the ability, while a conception of ability as acquired, implies that it can be improved with effort.

Therefore and as it has been shown so far, research has focused on relating, on the one hand, the motivational climate usually generated by the coach and the

beliefs of the causes of success in sports. On the other hand, this motivational climate is related to the implicit beliefs of the sports ability. However, to date there have been no studies that have analysed the predictive relationship between the beliefs of success in sports and the implicit beliefs of sports ability.

For this reason, this study aims to analyse the predictive relationship of implicit beliefs about ability over the causes of success in sports. Accordingly, it was hypothesised that: a) the implicit belief about incremental ability based on improvement will positively predict effort and negatively ability and deception as the main causes of success in sports; b) the implicit belief about incremental ability based on learning will positively predict the beliefs of the causes of success in sports based on effort and ability and negatively based on deception; c) the implicit belief about entity based on talent will positively predict the belief of the cause of success based on ability and deception and negatively on effort; d) the implicit belief about stable entity will positively predict sporting success beliefs based on ability, deception and effort (see Figure 1).

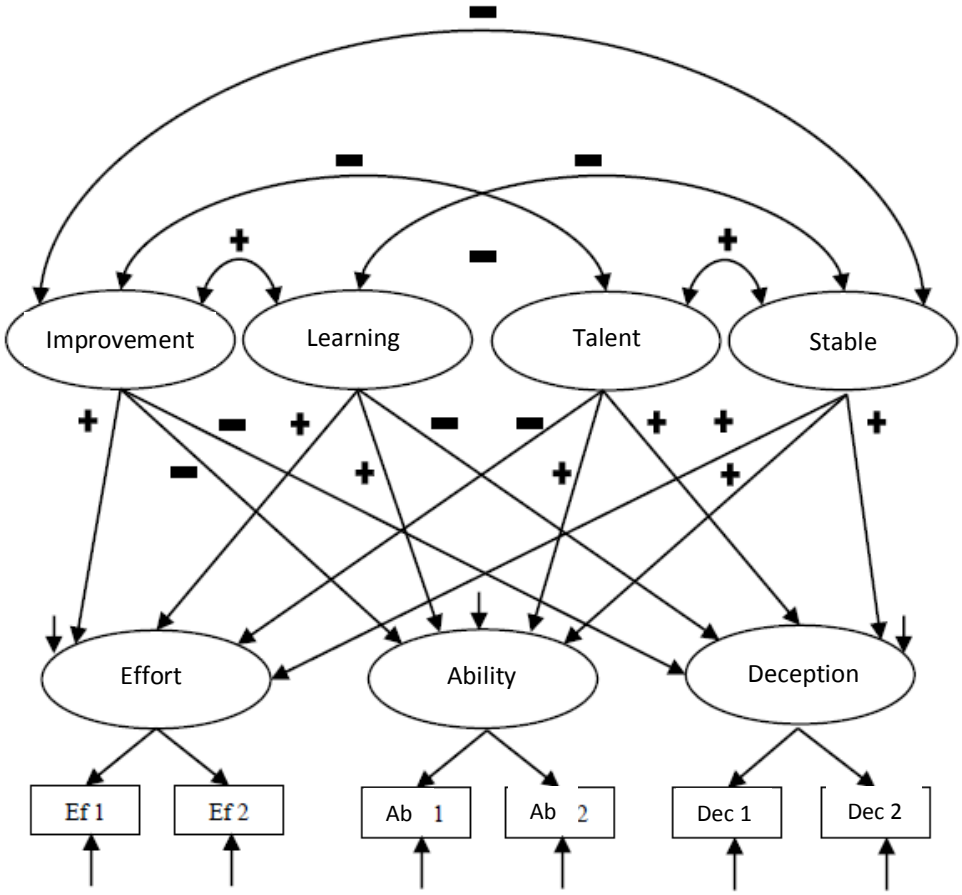

Figure 1. Structural hypothesised model about the relationships expected among the study variables.

MATERIAL AND METHODS

Participants

The study involved 444 handball players belonging to all the teams that played the last Spanish Championship of Autonomous Selections (CESA, for its Spanish initials) in the youth category (233 boys and 211 girls, M = 16.70, SD= 0.49) . These players are classified as high performance athletes according to Royal Decree 971/2007, of 13 July, on high-level and high performance athletes.

Instruments

Beliefs about the Causes of Success in Sports Questionnaire, (BACSSQ; Duda, Fox, Biddle, & Armstrong, 1992; Duda & Nicholls, 1992). The Spanish version of the questionnaire was used (Castillo, Balaguer, & Duda, 2002) which includes 18 items that measure the perceptions that athletes have about whether effort (nine items), ability (four items) and the use of deception techniques (five items) allow to achieve success in sports. In the questionnaire instructions, the athletes were asked: "*What do you think that people should do to be successful in the sport they practice most often?"* The answer was meant to be given on a five point Likert scale, from (1) *I completely disagree* to (5) *I strongly agree*. Previous studies have shown their reliability in the field of physical activity (Abraldes et al., 2016; Cervelló, Escartí, & Balagué, 1999; Guivernau & Duda, 1994; Ruiz-Juan et al., 2010) with values from α = 0.74 to α = 0.87 (effort), from α = 0.62 to α = 0.81 (ability) and from α = 0.71 to α = 0.72 (deception techniques). The total scale obtained a value of α = 0,79.

Conceptions of the Nature of Athletic Ability Questionnaire-2 (*CNAAQ-2*; Biddle et al., 2003). We used the Spanish version of the questionnaire (Moreno, Cervelló, Martínez, & Moreno, 2013), which includes 12 items divided into two higher-order subscales called incremental belief and entity belief. The subscale of entity beliefs consists of six items of which three correspond to the first-order variable of stable and the others to the variable of talent. Meanwhile, the incremental subscale consists of six items of which three correspond to the first-order variable of improvement and the others to the variable of learning. In the questionnaire instructions, the athletes were asked: "*Your beliefs about your ability in sports are..."* The answer was meant to be given on a five point Likert scale, from (1) *I completely disagree* to (5) *I strongly agree*. Both in the study by Moreno et al. (2013) and in this one, values of α = 0.72 (entity-stable), α = 0.86 (entity-talent), α = 0.73 (incremental-learning) and α = 0.68 (incremental-improvement) were obtained. On the other hand, in the recent study by Sáenz-López, Mateos, Almagro and Conde (2017) values of α = 0.67 (entity) and α = 0.83 (incremental) were obtained.

Procedure

For this research, the Royal Spanish Handball Federation (RFEBM, for its Spanish initials), the Andalusian Handball Federation (FABM, for its Spanish initials) as organising entity, as well as the different participating youth association teams were asked for permission by means of a letter with an attachment of the copy of the instrument where it was explained the objectives of the research and how it was going to be carried out. The data collection was conducted in a self-administered manner, in the different hotels where the participating teams were staying during the players' rest moments and with the prior consent of the players, coaches responsible for the teams and legal guardians. The participants were informed of the objective of the study, its voluntary nature, the absolute confidentiality of both the answers and the data processing as well as of the non-existence of correct or incorrect answers. Likewise, they were asked to answer the questions with the utmost sincerity and honesty. The approximate duration of the instrument management was of 30 minutes on average. All the ethical procedures in the data collection were respected at all times and the approval of the Ethics Committee of the University of Murcia was obtained.

Data analysis

The existence of atypical cases was verified and they were eliminated from the study taking into account the extreme values by Mahalanobis distance in addition to the detection of outliers, considering a typical score> 3 of inadequate distribution as absolute value. The descriptive statistics of the different study variables as well as the bivariate correlations were calculated. Subsequently, a structural regression analysis was carried out in order to test the hypothesised relationships among the study variables (see Figure 1). For this purpose, a stepwise approach was followed, as recommended by Anderson and Gerbing (1988). Firstly, a measurement model that allows construct validity of the instruments was performed. Secondly, a prediction model with a combination of variables was carried out to analyse the influences of some variables on others contemplated in the proposed model.

A normality test was conducted on each of the variables to determine the use of parametric or non-parametric tests depending on the normality found. The normality contrasts performed on the homogeneity of the variance (Statistical analysis of Levene's test, p> 0.05) accepted the hypothesis of normality for the majority of the variables, which motivated the use of parametric procedures. All the analyses were carried out with the statistical package SPSS 19.0 and Amos 19.0.

RESULTS

Descriptive analysis and bivariate correlations

Descriptive statistics (mean, standard deviation, asymmetry and kurtosis), the Cronbach alpha values for each of the subscales as well as the bivariate correlations for all the variables under study (see Table 1) are shown. The data revealed a higher score in the beliefs about effort as the cause of success and in the implicit beliefs about ability, incremental-learning and incremental-improvement (M = 4.54, 4.32, 4.37 respectively), in contrast to the belief in deception and perception of ability as an entity-stable (M = 1.99, 2.21 respectively).

The bivariate correlation analysis reflected a significant relationship among the variables, excluding beliefs about ability as incremental in both dimensions and belief about ability as a cause of sporting success. Thus, the subscales related to the belief of incremental ability maintained negative correlation with the belief of stable ability but were positively associated with the cause of success based on effort and negatively with those based on deception. On the contrary, the subscales referring to the belief of stable ability correlated negatively with those related to incremental belief and causes of success based on effort. Otherwise, its relationship with the causes of success based on ability and deception was positive.

The asymmetry and kurtosis indexes obtained values lower than 2, which indicates univariate normality in the data (Bolleng & Long, 1993).

Table 1. *Descriptive statistics and bivariate correlations of the sample*

		Range	*M*	*SD*	*A*	*K*	α	1	2	3	4	5	6	7
1	E-Stable	1-5	2,21	0,81	0,40	-0,18	0,72	-	0,33*	-0,25**	-0,33**	-0,13**	0,14**	0,24**
2	E-Talent	1-5	2,70	1,03	0,06	-0,67	0,86	-	-	-0,19**	-0,15**	-0,16**	0,27**	0,25**
3	I-Learning	1-5	4,32	0,67	-0,99	0,37	0,73	-	-	-	0,60**	0,34**	-0,02	-0,29**
4	I-Improvement	1-5	4,37	0,64	-0,98	0,46	0,68	-	-	-	-	0,35**	0,00	-0,25**
5	Effort	1-5	4,54	0,50	-1,14	0,81	0,84	-	-	-	-	-	0,16**	-0,21**
6	Ability	1-5	3,42	0,91	-0,10	-0,55	0,73	-	-	-	-	-	-	0,34**
7	Deception	1-5	1,99	0,84	0,72	-0,16	0,77	-	-	-	-	-	-	-

Note: * $p < .05$; ** $p < .01$; *M* = Mean; SD = Standard Deviation; A = Asymmetry; K = Kurtosis; α = Cronbach alpha value

Measurement model

First of all, the validation of the measurement model was carried out by proposing an analysis in which the latent variables correlated freely. The items of each variable were divided into pairs; so that half of the first items of each sub-scale

were averaged in order to create the first block of items and the second half of items were averaged to create the second block of items. Marsh (1994) proposed the use of item pairs because the results of these are more reliable. They also tend to be distributed more normally by reducing the number of variables observed. Therefore, the model is identified by measuring each latent variable by at least two indicators (McDonald & Ho, 2002).

The multivariate normality was verified by the Mardia coefficient (13.54), considering it appropriate given that values lower than 70 in this index state that the distance from multivariate normality is not inconvenient for the analysis (Rodríguez-Ayán & Ruiz, 2008). Meanwhile, the multicollinearity assumption was fulfilled since the bivariate correlations between the variables were below 0.85 (Pérez, Medrano, & Sánchez Rosas, 2013). The errors of the endogenous variables were independent since they were not correlated with other variables. The maximum likelihood method was used as an estimation method.

Bearing in mind that it is not advisable to use a single global adjustment measure of the model, different absolute and relative adjustment indexes were calculated (Bentler, 2007; Markland, 2007; Miles & Shevlin, 2007). The χ 2 as well as the ratio between χ2/df (degrees of freedom of the model) index were used as absolute indexes. As relative, the IFI, CFI and TLI indexes were calculated. It was also analysed in the RMSEA and RMSR indexes (Kline, 2005). The goodness of fit indexes obtained in the measurement model were adequate with a χ2 (18, N = 444) = 24.66; p <0.008; χ2/df = 1.98; CFI = 0.98; IFI = 0.98. TLI = 0.95; RMSEA = 0.04; RMSR = 0.03.

Structural regression model

In order to analyse the existing relationships among the variables belonging to the proposed model, it was hypothesised that implicit beliefs about ability predict beliefs about the causes of sporting success, and for this, a structural regression model was applied. The Mardia coefficient (13.54) and the covariance matrix were used as input for the data analysis. The goodness of fit indexes showed adequate values for the data (Hu & Bentler, 1999), being adjusted to the established parameters: χ2 (16, N = 444) = 27.75; p <0.01; χ2/df = 1.95; CFI = 0.98; NFI = 0.96; RMSEA = 0.03; SRMR = 0.03. The contribution of each one of the factors to the prediction of other variables was examined through the standardised regression weights. The t value associated with each weight was taken as a measure of the contribution, so that values higher than 1.96 are considered significant (Hair, Black, Balbin, & Anderson, 2009). All the aforementioned relationships (see Figure 2) were significant. The results revealed a positive prediction of the belief about incremental ability-improvement over effort (β = 0.20) and inversely over deception (β = -0.22). On the other hand, the implicit belief about incremental ability-learning positively predicted the belief of success based on effort (β = 0.26) and ability (β = 0.09) and negatively the belief based on deception (β = -0.09).

Regarding the implicit beliefs about ability as entity-talent positively predicted beliefs about the causes of success in sports based on ability (β = 0.31) and on deception (β = 0.20) and negatively on effort (β = -0.10). On the other hand, the implicit belief about ability as entity-stable predicted the ability (β = 0.09), deception (β = 0.14) and effort (β = 0.02) as beliefs of the causes of success in handball.

The relationships analysed explained 19% of the variance of the belief of the cause of success in handball based on effort, 12% based on ability and 21% based on deception.

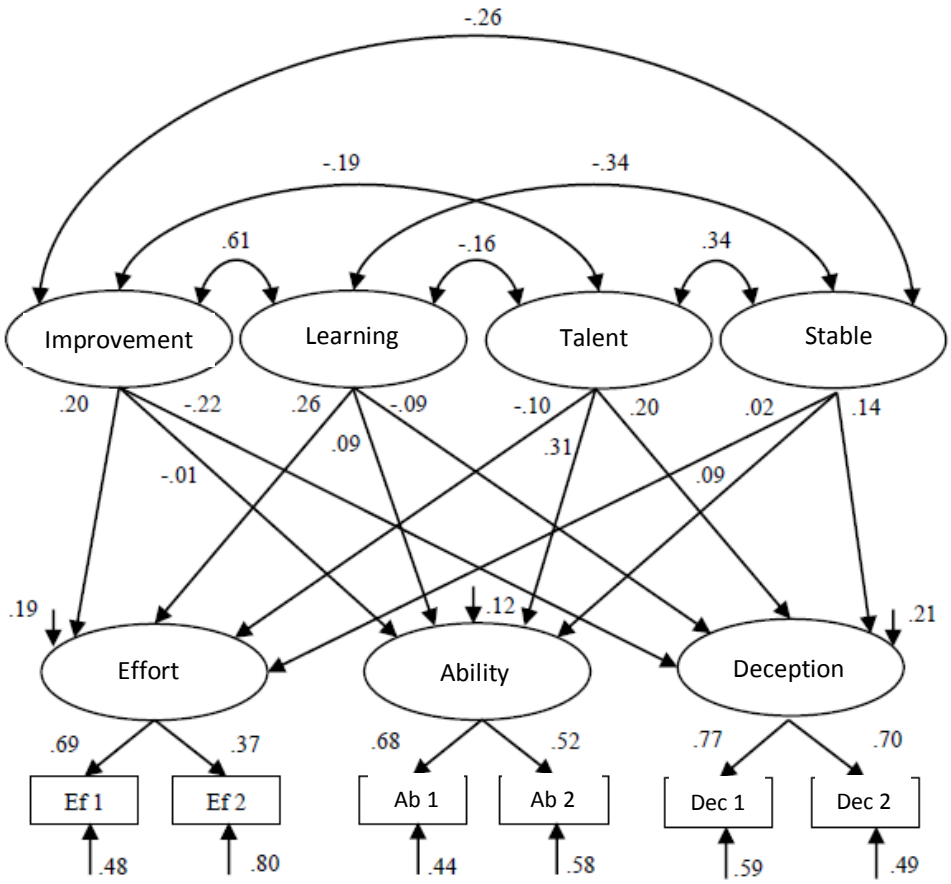

Figure 2. Structural regression model showing the relationships between the perception of sports ability and the beliefs about success. The beliefs about success are composed of groups of one or two items. All parameters are standardised and statistically significant at p <0.05. The variances explained are shown on the small arrows.

DISCUSSION

As for the first two hypotheses of this research paper, the results confirm that the implicit beliefs about incremental ability based on improvement and learning positively predict effort and negatively deception as beliefs of the causes of success in handball. Likewise, the following two hypotheses are also accepted in this study, that is, the implicit beliefs about ability as an entity based on talent and stability positively predict ability and deception and negatively predict effort as causes of success in handball. Nevertheless, no studies have been found in this respect neither in this sport nor in sports practise in general. The results confirm the postulate of Nicholls (1992) which considers the existence of a relationship between the implicit beliefs about ability as something stable or well acquired and the different beliefs about the causes of sporting success (ability or effort). These findings are of great importance from the practical point of view for the coach, since they point out that those players with implicit beliefs about ability being improvable and modifiable will strive more to achieve success in sports than those teammates who believe that ability is stable.

These results are related to several studies (Abraldes et al., 2016; Ruiz-Juan et al., 2010; Usán et al., 2017), which, despite not having contemplated all of these variables, did confirm that implicit beliefs of incremental ability are related to greater task persistence in both individual and collective sports.

To the contrary, focusing on the implicit beliefs about ability as an entity, the talent positively predicted the ability and deception as causes of success in handball and negatively the effort, while the implicit beliefs about ability as stable, positively predicted ability, deception and effort as causes of success. These results are in line with Spray et al. (2006) who claim that the implicit beliefs about ability can be incremental and of entity when athletes perceive sports ability as something "innate, but modifiable through effort". Therefore, it is necessary to emphasise that possibly an implicit belief about the sports ability as a stable entity does not have to mean a detraining of the effort of the athlete, but it can be complemented with the implicit incremental belief.

Finally, it should be stressed that variables such as age, the practised sport modality and the research context are elements to be considered and that can explain, at least in part, the great contrast among the results of the different researchers analysed.

CONCLUSIONS

In conclusion, it should be highlighted the existence of a relationship between the implicit beliefs of the players about the handball ability and the beliefs about the causes of success in handball. Therefore, it was found that players who understand sport as an incremental ability tend to qualify sporting success as more

dependent on effort. Otherwise, players who conceive sports ability as an entity identify sporting success as dependent on deception and personal ability.

For future research papers, variables such as gender, specific position of the players or ranking obtained in the classification could be considered, analysing the differences existing in both perceptions by following other recent studies (Mosleminezhad, Hemayattalab, & Fahimi, 2016; Usán et al., 2017). Regarding the limitations of this study, it should be noted that the structural equations model proposed is the one that presented the best fit, but it is assumed that it is only one of the possible choices (McDonald & Ho., 2002).

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