

# Self-efficacy perception in elite water polo goalkeepers

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## ABSTRACT

The sports in which there is the figure of goalkeeper, becomes relevant in order to obtain high performance, the perception of success that this participant is formed and that is configured as an expectation. Therefore, this study aims to analyse the association between perception of self-efficacy of two elite water polo goalkeepers and their coach and the observable performance in an international tournament. In order to measure the perception of behavioural success and their coach, it was used the Scale of achievement self-efficacy for water polo goalkeepers (Argudo, De la Vega, Tejero, & Ruiz, 2013). To measure the performance, were analysed all throwing's received by the two goalkeepers in the XV Water polo World Championship. The results indicate that there are differences between the perception of the player, the coach and the observed behaviour, appreciating that the goalkeeper's perception of success is superior to what actually happens. While in the female case, player and coach perception is less than the observed behaviour. **Keywords:** Sport psychology; Self-efficacy; High performance; Water polo.

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## INTRODUCTION

Water polo is a cooperation-opposition sport that combines high intensity and short duration actions. Where the goalkeeper's participation includes actions such as horizontal displacements, vertical jumps, accuracy passes, and high-speed throws blocking (Vila, Ferragut, Argudo, Abrales, Rodríguez, & Alacid, 2009) which requires the goalkeeper to act in tenths of a second that require great attention, concentration and ability to react and anticipate, with prolonged periods of low intensity.

Therefore, the performance of an elite water polo goalkeeper, not only requires mastering certain technical-tactical variables, such as efficiency and speed of movement or the correct spatial location, but also possess certain physiological variables such as long arms and strong legs (Lozovina, Lozovina, & Pavièiæ, 2012), to cope with long periods of apparent inactivity that requires psychological abilities to face errors. In this case Olmedilla, Ortega, Garcés, Abenza, Blas, & Laguna (2015) finding the best psychological profile for sports performance in goalkeepers.

In this sense, among the psychological elements that seem to have greater weight in the sporting performance of a goalkeeper find the concept of self-efficacy, defined by Bandura (1997) as the confidence in the own capacity to carry out a task or to realize a certain goal. Whose evaluative judgment that the person makes is also influenced by emotional factors that would play a fundamental role in the perception that one has about one's own competence and about the cognitive processing, which takes place (Kuiper, McDonald, & Derry, 1983).

Within the sports field and specifically in the modalities in which the goalkeeper figure exists, the perception of success that this participant is formed and that is configured as an expectation, gives rise to a process of adaptation with respect to the direct context, which influences greatly in individual and collective sports success (Argudo, De la Vega, & Ruiz, 2015). Since, athletes with greater perception of self-efficacy will face their actions better, will be more involved and will seek to overcome challenges, while those who maintain a perception of moderate self-efficacy will be less involved and will seek challenges that do not expose them.

Hence the importance of the study of self-efficacy in sport and motor behaviour (De la Vega, Ruiz, Tejero, & Argudo, 2012), given its organizing character about the movement and its influence on the action. Since the cognitive assessment made by the athlete on their own resources and competences would affect the entire process of adapting the athlete to the context, dedicating their available resources differentially depending on the perception of competence that is had, which would also influence the feeling of control obtained (Bandura, 1977) and therefore an improvement in sports success.

In a generic way, recent studies present favourable data on the influence of the practice of regular physical-sports activities in increasing the feeling of competition, which also affects group or individual performance. As well as the gender variable, showing women preferred behaviours towards a greater increase in perceived motor competition in individual games and sports compared to men, who obtain better results in the practice of collective sports (Balaguer, 1998; Carrol, & Loudis, 2010; Hellín, Moreno, & Rodríguez, 2006; Ruiz, 1995).

In high performance, Arruza et al. (2009, 2011) find in athletes of several different sports modalities that the realization of a competition plan is a good instrument for increasing self-efficacy, as well as influencing mood and stress tolerance, which would play an essential role as mediator of the athlete's psychological performance. In this same line, Levy, Nicholls, & Polman (2011) they find that the greater the confidence, the

higher the level of perceived performance, experimentally demonstrating this thesis Beattie, Lief, Adamoulas & Oliver (2011), in golfers allowing to predict 49% of the variance of effectiveness.

On the other hand, as found in the study conducted by Thomas, Lane, & Kingston (2011), following a qualitative methodology in the study of the factors involved in self-confidence and self-efficacy in sport, the very nature of these constructs would be multidimensional, which requires various investigations that allow us to draw adequate conclusions about the different dimensions that are included in them allowing; in addition, the creation of instruments that enable the measurement of the perception of self-efficacy in specific sports such as, in the case at hand, is water polo, constituting a current line of work and relevant research (Argudo, De la Vega, Tejero, & Ruiz, 2013; De la Vega, Ruiz, Tejero, & Argudo, 2012).

Based on all of the above, and taking into account the excellent usefulness of the studies carried out in a large event of the highest sports level, especially due to the great difficulty of accessing the sample, the main objective of this research is to analyse which it is the degree of association between the perception of behavioural success of two elite water polo goalkeepers, the perception of success of their coach and the observable behavioural performance in an international competition.

## METHODS

### **Participants**

This study analyses the case of two senior high-performance water polo goalkeepers. At the time of the investigation, she had 23 years of age, with experience in the highest category of clubs of seven seasons and as goalkeeper of the national team of six years, being the undisputed holder in both sports groups. While he had 30 years of age, with experience in the top category of clubs of fourteen seasons and as goalkeeper of the national team of eleven years, being the holder in both sports groups. For the selection of candidates, incidental sampling was carried out for the sole reason of viable access. Participation was voluntary and consented, describing the main objectives of the study. The participants did not receive any financial compensation or reward. According to the principles of ethical research referred to the need to maintain the anonymity of research participants (Salkind, 1999), no other characteristics of the participants under study are described.

### **Design**

The study has a descriptive and correlational design. According Montero, & León (2007), The design belongs to the category of "case studies" subtype "instrumental", since it constitutes a descriptive study with a single sample unit where the researcher intentionally chooses the participant for being prototypical or representative and where they were analysed: (1) perception of self-efficacy of goalkeepers' achievement in throwing, (2) perception of coach's self-efficacy of goalkeeper's action in throwing and (3) successful conduct of throwing during the sporting competition.

### **Procedure**

To measure the perception of efficacy, the *Achievement Self-efficacy Scale for Water Polo Goalkeepers* has been used (Argudo, De la Vega, Tejero, & Ruiz, 2013). The instrument consists of 34 items that describe different types of throw. In the protocol of the scale, athletes and the coach are asked to report their degree of success in stopping throws in sports competition, according to what is usual and majority for them and according to their own experiences. There is a five-point Likert response scale: (1) "very little success, I stop less than 20% of throws", (2) "little success, I stop between 21% and 40% of throws", (3) "Some success, I stop between 41% and 60% of releases"; (4) "quite successful, I stop between 61% and 80%"; and (5) "very

successful, I stop more than 80% of releases". Likewise, the scale allows the level of perception to be measured from 1 to 5, using the arithmetic mean obtained from all the items. The two participants were given the scale, allowing them to decide the time and place to complete it. The researchers collected the answers after a week and just before the celebration of the sporting event.

For the measurement of successful behaviour in sports competition, all throws received by the two participants in the XV Water Polo World Championship, held in Barcelona (Spain), were analysed by observation. In this regard, four observers, previously trained in observational categorization, analysed a total of 92 throws in the case of the goalkeeper and 80 throws in the case of the goalkeeper. The Polo Analysis Direct v1.0 software was used for this (Argudo, Alonso, Fuentes, & Ruiz, 2010). In this way, the score of the participants was obtained in the 34 items described in the scale and the percentage of goalkeepers' throwing stoppage, categorizing from 1 to 5 as previously seen: (1) less than 20% of arrests, (2) between 21% and 40%, (3) between 41% and 60%, (4) between 61 and 80%, and (5) more than 80% of stopped throws. The data on the observable behaviour of stopping in sports competition are highly reliable, where a Kappa agreement index between observers equal to .99 was reached. Finally, what was declared by the participants was contrasted with respect to their effectiveness in attaining throwing offs with the stop percentages observed in sports competition.

### Data analysis

In order to analyse the degree of association between the perception of self-efficacy of the goalkeeper's stopping success and his behaviour observed in competition, proceeded by means of Spearman Correlation Coefficient ( $\rho$ ). This statistic was interpreted according to Salkind (1999), considering very low correlations between 0 and .2, low between .21 and .40, moderate between .41 and .60, high between .61 and .80, and very high between .81 and 1. Likewise, in a complementary way, both variables interpreted as independent were compared for which we proceeded with a non-parametric Spearman rho test and the effect size was estimated using the Cliff delta parameter ( $\delta_c$ ) (Cliff, 1993). The calculations have been carried out with the help of the IBM SPSS Statistics 20 software application and a significance level of  $p < .05$  was established.

## RESULTS

Table 1. Descriptive statistics and correlations (*rho*) of throws received by goalkeepers (n=34 and n=32).

	Female							Male						
	N	M	SD	$\delta_c$	GP	OB	CP	N	M	SD	$\delta_c$	GP	OB	CP
Goalkeeper's perception	34	2.79	1.01	-.11	1	.721*	.06	32	3.56	.98	-.08	1	.14	.13
Behaviour observed	34	3.21	1.2	.25		1	.02	32	3.29	1.03	-.03		1	.44*
Coach's perception	34	3.09	.93	.16			1	32	3.38	1.18	-.14			1

Legend: SD=Standard Deviation, GP=Goalkeeper's Perception, OB=Observed Behaviour, CP=Coach Perception, \* $p < .001$

The data provided in table 1 report that the male goalkeeper's perception of effectiveness ( $3.56 \pm .98$ ) is slightly higher than the coach's perception of effectiveness ( $3.38 \pm 1.18$ ) and the actual behaviour observed

( $3.29 \pm 1.03$ ), in the case of the male goalkeeper. Finding a statistically significant and moderate size difference ( $\rho=.442$ ;  $p=.033$ ;  $\delta c=-.03$ ), between the coach's perception and the behaviour observed.

Likewise, the data shown in Table 1 report that the female goalkeeper's perception of effectiveness ( $2.79 \pm 1.01$ ) is slightly lower than the coach's perception of effectiveness ( $3.09 \pm .93$ ) and behaviour real observed ( $3.21 \pm 1.20$ ). Finding a statistically significant and moderate size difference ( $\rho=.721$ ;  $p<.001$ ;  $\delta c=.11$ ), between the perception of the athlete and the behaviour observed.

## DISCUSSION

This study has developed a contextualized analysis in high-performance water polo on the correspondences that are established between the perception of behavioural success of athletes, their coach and real behaviours in competition during the development of a world championship.

Among the main findings found are the differences between the perception of the coach and the behaviour observed ( $\rho=.442$ ;  $p=.033$ ;  $\delta c=-.03$ ) in the case of the analysis to the male athlete; and the appearance of significant differences. In the case of the female athlete between her perceptions of success and her observed behaviour ( $\rho=.721$ ;  $p<.001$ ;  $\delta c=.11$ ). In this sense can be seen in a descriptive way that, in the male case, the perception of the goalkeeper's success is upper to what really happens, which could be justified by the competitive level he has. While in the female case both the perception of the player and the coach is lower to the observed behaviour.

Following these results, the support of the approaches defended by Beattie *et al.* (2011) and Vancouver, Thompson, & Williams (2001), in which is affirmed that the perception of success is not directly related to the performance achieved in competition, which shows that there are differences between perception and action (Hernández, Santacreu, & Rubio, 1999). The results of this study, therefore, do not match what Mowlaie, Besharat, Pourbohloul, & Azizi (2011), who appreciate significant correlations between self-efficacy, stated and sports performance.

On the other hand, the results of this study question the argument about the ability to perceive the success of athletes and elite coaches about the relevant behaviours of their role. What is evident in the differences found on the perception of success in this study, distorted in the positive sense in the case of the female athlete and in the negative sense in the case of the male athlete, so that it does not adjust to their level of performance real in competition. What could compromise their own self-regulatory capacity and the possible effect that potential sources of information and feedback exert, such as the coach, the environment, partners and rivals.

Likewise, both coaches and researchers emphasize the importance of the goalkeeper's role in the collective success of the team (González, Bermúdez, Martínez, & Chiroso, 2017), highlighting his psychological profile and demonstrating the influence exerted by the goalkeeper's self-efficacy expectations in achieving sports success. Whose assessment allows us to affirm that the chances of victory in a match increase as the efficiency of the goalkeepers increases. Finding in World Handball Championships that efficiency rates close to 45% (Trejo, & Planas, 2018) result in the team being victorious, showing this study similar value in terms of percentage of goalkeeper's efficiency.

On the other hand, one of the limitations of this study lies in the low number of participants, since only one goalkeeper of each sex (experts) was analysed and where the possible influence of age, collective efficacy

was not taken into account, the own expectations of result (individual and collective) and the motivation of the participants (García-Naveira, 2018), as well as the result or the final classification of the team. Another of the limitations found has been the low scientific corpus related to this topic, since although in recent years the scientific works that analyse the performance of competing teams from different perspectives have begun to emerge (González et al., 2017), few studies specifically analyse the actions of the goalkeepers during the game and less consider the performance combining subjective measures (player's and coach's perception), with objective measures (performance measured in competition), which makes it more difficult to contextualize and compare the results presented here.

So one of the explanations that we consider more plausible when interpreting the difference in the results of the different investigations, focuses on the fact that different recent studies, such as that of Levy, Nicholls, & Polman (2011), those who use the perception of performance as a performance variable, finding a logical degree of high agreement between the perception of their own effectiveness and the performance achieved, while both belong to the athlete's cognitive and subjective dimension. However, when objective measures of performance behaviours are used, this relationship is no longer clear, the phenomenon described by Vancouver, & Tichner (2004), according to which, when it comes to complex tasks at the cognitive level, having a favourable perception of competence affects the result obtained in a positive way, while the relationship is zero and even negative when the cognitive involvement of the task is weak.

Likewise, future research would be interesting to approach methodologies that allow comparing behavioural parameters of players' performance, with respect to different psychological variables that have a clear subjective character, so that clearer conclusions can be established on the role that these variables play on the performance achieved, and on other variables that can have a positive or negative effect on performance, such as sports technicians and their leadership and communication styles.

## **CONCLUSION**

In conclusion, and in line with the results presented by García-Naveira (2018), can affirm that high self-efficacy offers higher levels of sports performance, and that the attacking or defensive tendency of the player is multifactorial (physical, technical, tactical and psychological) and the product of his historical-sports development.

## **AUTHOR CONTRIBUTIONS**

Conceptualization, F.M.A. and P.B.; formal analysis, E.R. and A.A.; methodology, F.M.A., E.R. and P.B.; project administration, F.M.A.; resources, A.A.; supervision, F.M.A., E.R. and P.B.; visualization, A.A. and E.R.; writing—review & editing, F.M.A., A.M., E.R. and P.B.

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## **DISCLOSURE STATEMENT**

The authors declare no conflicts of interest.

## REFERENCES

- Argudo, F. M., Alonso, J. I., Fuentes, F., & Ruiz, E. (2010). Polo Análisis v1.0 Directo. Registro computerizado para la evaluación táctica cuantitativa en tiempo real en waterpolo. En F. M. Argudo, S. Ibáñez, E. Ruiz & J. I. Alonso, *Softwares aplicados al entrenamiento e investigación en el deporte* (pp. 137-147). Sevilla: Wanceulen.
- Argudo, F. M., De la Vega, R., & Ruiz, R. (2015). Percepción de éxito y rendimiento deportivo de un portero de waterpolo. *Apunts*, 122, 21-27. [https://doi.org/10.5672/apunts.2014-0983.es.\(2015/4\).122.02](https://doi.org/10.5672/apunts.2014-0983.es.(2015/4).122.02)
- Argudo, F. M., De la Vega, R., Tejero, C. M<sup>a</sup>., & Ruiz, R. (2013). Escala de autoeficacia de logro para porteros de waterpolo. Validación de contenido y traducción anglosajona. *Revista Española de Educación Física y Deportes*, 401, 125-136. [https://doi.org/10.5672/apunts.2014-0983.es.\(2015/4\).122.02](https://doi.org/10.5672/apunts.2014-0983.es.(2015/4).122.02)
- Arruza, A., Sajoa, T., Gil, L., Arribas, S., Balagué, G., Cechinni, J. A., & Brustad, B. (2009). Understanding the relationship between perceived development of the competition plan and sport performance: mediating effects of self-efficacy and state depression. *Perceptual and Motor Skills*, 109(1), 304-314. <https://doi.org/10.2466/pms.109.1.304-314>
- Arruza, J. A., Arribas, S., Otaegi, O., González, O., Irazusta, S., & Ruiz, L. M. (2011). Perception of competence, mood state and stress tolerance in young high performance athletes. *Anales de Psicología*, 27(2), 536-543.
- Balaguer, I. (1998). Self-concept, physical activity and health among adolescents. Trabajo presentado en 24th International Congress of Applied Psychology, San Francisco.
- Bandura, A. (1977) Self-efficacy: toward an unifying theory of behavioral change. *Psychological Review*, 84, 191-215. <https://doi.org/10.1037/0033-295x.84.2.191>
- Bandura, A. (1997). *Self-efficacy*. New York: Freeman.
- Beattie, S., Lief, D., Adamoulas, M., & Oliver, E. (2011). Investigating the possible negative effects of self-efficacy upon golf putting performance. *Psychology of Sport and Exercise*, 12, 434-441. <https://doi.org/10.1016/j.psychsport.2011.02.004>
- Carroll, B. & Loidis, J. (2010). Children's perceived competence and enjoyment in physical education and physical activity outside school. *European Physical Education Review*, 7(1), 24-43. <https://doi.org/10.1177/1356336x010071005>
- Cliff, N. (1993). Dominance statistics: ordinal analyses to answer ordinal questions. *Psychological Bulletin*, 114 (3), 494-509. <https://doi.org/10.1037/0033-2909.114.3.494>
- De la Vega, R., Ruiz, R., Tejero, C. M<sup>a</sup>., & Argudo, F. M. (2012). Escala de autoeficacia de lanzamiento en waterpolo. Trabajo presentado en XIII Congreso Nacional y I Foro del Mediterráneo de Psicología de la Actividad Física y el Deporte. Universidad de Murcia, España.
- García-Naveira, A. (2018). Autoeficacia y rendimiento en jugadores de fútbol. *Cuadernos de Psicología del Deporte*, 2(18), 66-78.
- González, A., Bermúdez, S. G., Martínez, I., & Chiroso, L. J. (2017). Eficacia de los porteros en los Juegos ODESUR y Campeonato Panamericano de Balonmano en 2014. *Apunts. Educación física y deportes*, 4(130), 95-105. [https://doi.org/10.5672/apunts.2014-0983.es.\(2017/4\).130.08](https://doi.org/10.5672/apunts.2014-0983.es.(2017/4).130.08)
- Hellín, P., Moreno, J. A., & Rodríguez, P. L. (2006). Influencia social del género y de la percepción de competencia en la valoración de las clases de educación física. *Revista Española de Educación Física y Deportes*, 5, 37-49.
- Hernández, J. M., Santacreu, J., & Rubio, V. (1999). Evaluación de la personalidad: una alternativa teórico- metodológica. *Escritos de Psicología*, 3, 20-28.

- Kuiper, N., McDonald, M., & Derry, P. (1983). Parameters of a depressive self-schema. En J. Suls & A. Greenwald (Eds), *Psychological perspectives on the self* (pp. 191-217). Hillsdale, NJ: Erlbaum.
- León, O. G., & Montero, I. (2003): *Métodos de investigación en Psicología y Educación* (3ª edición). Madrid: McGraw-Hill.
- Levy, A., Nicholls, A., & Polman, R. (2011). Pre-competitive confidence, coping, and subjective performance in sport. *Scandinavian Journal of Medicine & Science in Sport*, 21(5), 721-729. <https://doi.org/10.1111/j.1600-0838.2009.01075.x>
- Lozovina, M., Lozovina, V., & Pavièiæ, L. (2012). Morphological changes in elite male water polo players: Survey in 1980 and 2008. *Acta Kinesiologica*, 6(2), 85-90.
- Montero, I. M. & León, O. G. (2007). A guide for naming research studies in Psychology. *International Journal of clinical and Health psychology*, 7(3), 847-862.
- Mowlaie, M., Besharat, M. A., Pourbohloul, S., & Azizi, L. (2011). The mediation effects of self-confidence and sport self-efficacy on the relationship between dimensions of anger and anger control with sport performance. 2nd World Conference on Psychology, Counselling and Guidance-2011. *Procedia social and Behavioral Sciences*, 30.
- Olmedilla, A., Ortega, E., Garcés, E., Abenza, L., Blas, A., & Laguna, M. (2015). Perfil psicológico de los jugadores profesionales de balonmano y diferencias entre puestos específicos. *Revista Latinoamericana de Psicología*, 47(3), 177-184. <https://doi.org/10.1016/j.rlp.2015.06.005>
- Ruiz, L. M. (1995). *Competencia Motriz. Elementos para comprender el aprendizaje motor en educación física escolar*. Madrid: Gymnos.
- Salkind, N. J. (1999). *Métodos de investigación*. México: Pearson Prentice Hall.
- Thomas, O., Lane, A., & Kingston, K. (2011). Defining and contextualizing robust sport-confidence. *Journal of Applied Sport Psychology*, 23(2), 189-208. <https://doi.org/10.1080/10413200.2011.559519>
- Trejo, A. & Planas A. (2018). Eficacia ofensiva en situaciones de desigualdad numérica en el balonmano femenino. *Apunts. Educación Física y Deportes*, 131(1), 95-107. [https://doi.org/10.5672/apunts.2014-0983.es.\(2018/1\).131.07](https://doi.org/10.5672/apunts.2014-0983.es.(2018/1).131.07)
- Vancouver, J., Thompson, C., & Williams, A. (2001). The changing signs in the relationships between self-efficacy, personal goals and performance. *Journal of Applied Psychology*, 86, 605-620. <https://doi.org/10.1037/0021-9010.86.4.605>
- Vancouver, J. B. & Tischner, E. C. (2004). The Effect of Feedback Sign on Task Performance Depends on Self Concept Discrepancies. *Journal of Applied Psychology*, 89, 1092-1098. <https://doi.org/10.1037/0021-9010.89.6.1092>
- Vila, H., Ferragut, C., Argudo, F., Abraldes, J., Rodríguez, N., & Alacid, F. (2009). Relationship between anthropometric parameters and throwing velocity in water polo players. *Journal of Human Sport and Exercise*, 4(1), 57-68. <https://doi.org/10.4100/jhse.2009.41.07>

