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## ORIGINAL

# THE EFFECT OF STORIES ON REAL AND PERCEIVED AQUATIC COMPETENCE IN PRESCHOOLERS

## EFFECTO DE LOS CUENTOS EN LA COMPETENCIA ACUÁTICA REAL Y PERCIBIDA EN INFANTES

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### ABSTRACT

Even though a growing interest exists in the study of the renewal of the traditional 'play' curriculum, as well as the utilization of the aquatic medium as an educational resource, at present, very few studies link both areas. For this reason, the objective of this quasi-experimental study was to confirm the effect of aquatic motor tales over perceived motor competency and real motor capacity. We studied 16 preschoolers among 3 to 5 years of age for their real

and perceived aquatic motor competency. After a non-parametric test was administered, the results show that administration of aquatic mobility stories contributed positively and significantly on the perceived motor competence of the experimental group. The results are discussed in favor of inclusion of aquatic educational programs in order to promote the self-esteem of this age-group.

**KEY WORDS:** perceived competency, motility stories, aquatic activities, preschool education.

## **RESUMEN**

Pese a existir un interés creciente en los estudios por la renovación de los contenidos lúdicos tradicionales, así como en la utilización del medio acuático como recurso educativo, en la actualidad existen muy pocas investigaciones que relacionen ambos aspectos. Por ello, el objetivo de este estudio cuasi-experimental fue comprobar el efecto de los cuentos motores acuáticos sobre la competencia motriz percibida y la capacidad motriz real. Los participantes fueron 16 infantes de 3 a 5 años a los que se le midió la competencia motriz real y percibida acuática. Tras una prueba no paramétrica los resultados mostraron que la administración del programa de cuentos motores contribuyó de manera positiva y significativa sobre la competencia motriz percibida del grupo experimental. Se discuten los resultados en pro de incluir en los programas educativos acuáticos los cuentos motores de cara a fomentar el autoconcepto infantil.

**PALABRAS CLAVE:** competencia percibida, cuentos motores, actividades acuáticas, educación infantil.

## **INTRODUCTION**

The recognition of the usefulness of aquatic motor activities has become apparent in numerous studies over the last few years (Castillo, 2001; Cotrino, Moreno, and Pérez, 2005; Moreno and De Paula, 2009), highlighting the benefits to the social, cognitive and motor areas of the personality during the pre-school stage. For example, Albarracín and Moreno-Murcia (2009, 2011) consider that command of the body in this medium is related to self-confidence and to broadening the limits of personal freedom, and as such supports responsibility and autonomy. In this sense, there seems to be a consensus in research about recommending this content to be used in the curriculum for preschool education (López and Aznar, 2003). It is also apparent that programs designed in the aquatic medium have demonstrated benefits for some aspects of personal/social and motor development in children, emphasizing motivation and perceived self-confidence (Diem et al., 1978). In this context, recreational tales represent a source of didactic interest on all levels (motor, physical, social, intellectual and cultural), thanks to the possibilities of interconnection with different areas of knowledge. In the last few years, some studies suggest bringing back the educational entertainment tradition in general, and through its

didactic manipulation create a tool capable of promoting its pedagogical potential in the area of physical education (Méndez-Giménez and Fernández-Río, 2011). All these reasons make it apparent that there is a need to carry out studies that combine recreational stories with the potential of the aquatic medium to stimulate the integral development of a person.

In this way, recreational resources would make sense in the curriculum because it would contribute to the development of basic competences. In relation to the perception of self-confidence that children report, it is particularly important to point out that during this stage, when children gradually discover new forms of finding their limitations through trial-error and exploration, dilemmas between their real competence and their perceived competence begin to appear. In this sense, in the last decade the current educational system has established the need to provide a global education for students, so in pre-school education, significant teaching forms have been required which would suit children's characteristics, such as *symbolism*, and looking for methodologies which include motivation as their primordial factor (Beltrán, 2001).

The development of motor competence should be contemplated as a fundamental objective in the context of the new legislative framework in education and the proposals by the European Space for Higher Education for competence teaching-learning processes to be initiated from pre-school education (up to six years old) to enable a more competitive society where people can aspire to greater personal growth (Martínez 2011). Motor competence is understood as what children are capable of doing with respect to their body and objects (García-Ferro, 2012; Ruíz and Graupena, 2005) and involves acquiring the knowledge necessary to move adaptively in the environment (Ruiz, 2008). Through interaction with the most immediate environment and through movement, a child has the opportunity to become familiar, investigate and experiment with objects, progressively forging a positive feeling of confidence about their own capabilities and competencies (Franco, 2008; Palomera, Martín, and Ruíz-Aranda, 2012; Ramos, 2009).

According to Piaget (Mounoud, 2001), the role of movement in infancy can be found in the genesis of any intellectual acquisition, suggesting that through action children develop their cognitive, motor and social abilities. During the pre-school stage, when the main global motor behaviors and broad and diversified motor learning are developed, it would be appropriate to enable children to move about with maximum freedom in different situations (Zomeño and Moreno, 2003). In this sense, an aquatic medium proves to be an ideal scenario which, according to studies (Jofre and Lizalde, 2003; Moreno, Arias, Caravaca, Del Castillo, Pinto, and De Paula, 2010; Zomeño, Marín, and Moreno, 2007), provides people with new motor possibilities which help them to grow through new experiences.

Finally, the role of parents, tutors, or teachers is also important in this task, as they should make sure that the proposed activities are ideal for prompting a process that enables children to develop integrally, by providing them with the necessary information in each situation so that they are able to assimilate aquatic motor skills well (Cirigliano, 1986). This would contribute to their aquatic

motor competence, that is to say, their real ability to solve any aquatic motor problem that relies on the structures developed during the teaching-learning process (Moreno, 2005); and their perceived aquatic motor competence, which refers to how children see themselves with respect to the execution of an activity implemented in this medium (Moreno and Ruíz, 2008). Until recently, however, and in the context of a traditional teaching philosophy, children between 3 and 6 have shown a great lack of confidence and fear with respect to the aquatic medium, in which case it would be suitable for encouraging the use of teaching scenarios where greater confidence and assurance would be generated in the participant (Cirigliano, 1982). During this stage, play (Lavega, Planas and Ruíz, 2012) and dramatization can become adequate strategies to achieve this goal (Domínguez, Lezeta, and Espeso, 2001) and, in fact motility stories present a novel alternative (Martínez and Moreno, 2011; Muñoz, 1999; 2011), because they provide a pedagogical tool focused on children exploring their many motor and creative possibilities (Iglesia, 2008; Ruíz, 2011).

In the context of the above, the aim of this study was to look into the effect of the administration of motility programs on perceived aquatic motor competence and ability in a sample of 3 to 5 year old children. We hypothesize that through the use of motility stories there will be an improvement in aquatic motor competence and ability in the children belonging to the experimental group in contrast to the control group..

## METHOD

### PARTICIPANTS

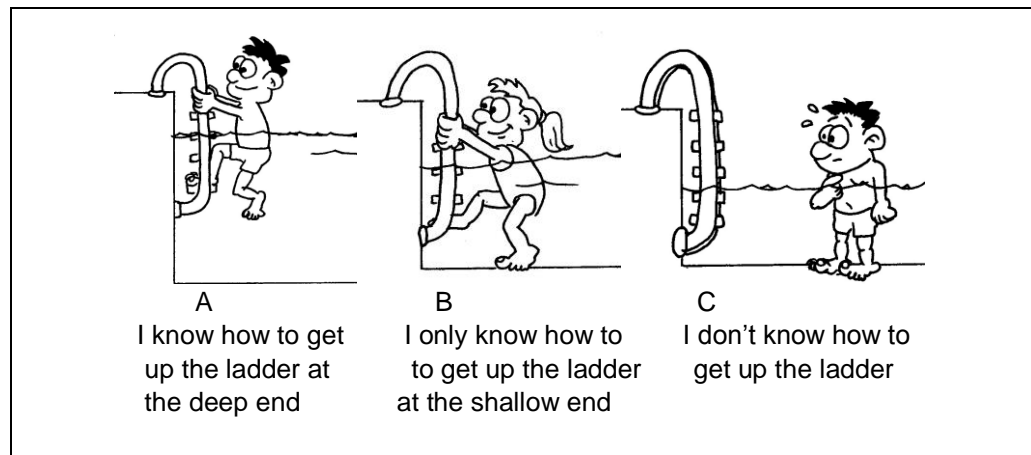
16 children aged between 3 and 5 participated in this study ( $M = 4.39$ ,  $DT = .57$ ). 56.25% were girls in contrast to 43.75% boys. 12.50% were 3 years old, 81.25% were 4 and 6.25% were 5. The total sample was divided into two groups, an experimental group ( $n = 8$ ) with the same number of boys as girls, and the control group ( $n = 8$ ) where 62.50% were girls in contrast to 37.50% boys.

### INSTRUMENTS

**Aquatic Motor Skill.** We used the 'aquatic motor skill' factor from the *Escala Pictórica de Competencia Acuática Percibida* (EPCAP) (Pictorial Scale of Perceived Aquatic Competence) by Moreno and Ruíz (2008) which measured the level of aquatic motor ability a child perceived. The six items are answered on a Likert scale of three options (presented as three comic images) where A corresponds to "best", B to "moderate" and C to "worst" (e.g. Figure 1). Participants are shown the three alternative comic images individually to help them understand the question. Holding a pencil, they should point to the image which is most similar to themselves. Each participant is shown the items in random order so as to control possible errors. Likewise, the intra-element (response option) is varied per item. Internal consistency for this dimension was .82.

**Figure 1.** Example of item response: “Can get up the ladder? From the aquatic motor skill scale (Moreno and Ruiz, 2008)

4. Can you get up the ladder?



**Aquatic Motor Competence.** Aquatic skills are measured with an experimentation test which was created for the occasion (Annex I). It consisted of eight connected tests on a circuit; each test was evaluated on a measure scale of 1 (*does it incorrectly*) to 4 (*does it correctly*). The test consists of: diving through a ring that is floating in the water at about 0.5m from the edge, picking up a ring which is at a depth of 1.2 m from the surface, getting back to the surface and moving through the water on back to reach a tube suspended a few centimeters above the water and placing the ring on the tube, then getting onto an airbed and walking on it until reaching the end of it, jumping into the water to collect one of the objects floating in front of it, which should be taken to a bucket by swimming on front, when near the bucket should throw the object inside. Good results were obtained in the intra-explorer reliability and validity test. As it was a single explorer, the inter-explorer test was not carried out.

**Table 1.** Intra-explorer Reliability and Validity Coefficient of Experimentation Test

Tests	reliability R	f	Validity p-value
1. Dive head first	0.89	2.2	n.s.
2. Immersion	0.90	2.1	n.s.
3. swim on back	0.88	1.9	n.s.
4. Place ring	0.96	-	n.s.
5. Balance on the float	0.89	-	n.s.
6. Jumping from the float for the "treasure"	0.98	-	n.s.
7. Swim on front	0.99	-	n.s.
8. Place object in the bucket	0.95	2.1	n.s.

## RESEARCH PROCEDURE AND DESIGN

The quasi-experimental study was carried out at the initiation stage of aquatic skills in a private center with 3 to 5 year old children. The participants had approximately six months experience within the aquatics initiation program,

attending an average two days a week for 45 minutes. The criterion for determining the control group and the experimental group was intentional, with both groups established at the beginning of the course being maintained. So, there were eight participants in the control group and the other eight participants were in the experimental group. After receiving permission to carry out the study from the instructors in charge of the courses and authorization from the children's parents, the intervention was started.

The study period was between April and May, and consisted of 12 classes of 49 minutes duration approximately. In a class prior to the intervention, the level of aquatic motor competence and ability was evaluated. The same data were collected again at completion of the intervention. Both the control group and the experimental group followed the same objectives and content (movement, manipulations and balance). The control group followed a traditional methodology, which consisted in tasks being presented by the instructor and the infants repeating them.

**Motility Stories Program.** During each lesson a motility story (an action played out and experienced collectively which aims to contribute to motor, intellectual, affective and social development) was put into practice. The children listened to the tale and became the active characters from the story, representing what was being told in the story. To do this, the story was introduced in the first animation phase, and they were encouraged to participate actively in it. In the second main phase, while the tale was narrated, the participants played it out by doing the different motor activities from the tale. In the last phase (back to peace and quiet), the narration brought them to a more relaxed situation, and as the ending of the story was told, they formed a circle to reflect a little and analyze what had happened during the story with questions like: "Did you like the story? What did you most like about the story? Who wants to do another story tomorrow?" The story narrator was involved in the story like any other participant, trying to maintain fluid dynamics and continuity, besides contributing to the participants' integration and lack of inhibition.

### *Data Analysis*

The research was based on a pre-post quasi-experimental design with an experimental group and a control group. The independent variables established to carry out the study were based on the use of aquatic motility tales for teaching aquatic motor skills. The dependent variables were aquatic motor competence and aquatic motor ability.

First, the Kolmogorov-Smirnov test was carried out to test whether the sample met normality, and results showed that non-parametric tests were required. Second, a non-parametric test was carried out for independent samples (U of Mann-Whitney) to analyze whether there were differences between the groups before the intervention. Finally, a non-parametric test was made after the intervention for related samples (Wilcoxon) to find out the intra-group difference. The different analyses were made using statistical software SPSS 19.0.

## RESULTS

### PRELIMINARY ANALYSIS

The non-parametric test for independent samples (U de Mann-Whitney) did not show significant differences in aquatic motor competence ( $U = 13.00, p > .05$ ) or in aquatic motor ability ( $U = 8.00, p > .05$ ), which was based on two homogenous groups.

#### *Effects of program intervention*

To find out the intra-group differences in the variables analyzed a non-parametric test for related samples was made (Wilcoxon). Significant differences were found in aquatic motor ability ( $p < .05$ ) in the experimental group, with higher measures being obtained after the intervention (Table 2).

**Table 2.** Non-parametric test for Related Samples

		Experimental Group ( $n = 8$ )			Control Group ( $n = 8$ )		
		<i>M</i>	<i>DT</i>	<i>Z</i>	<i>M</i>	<i>DT</i>	<i>Z</i>
Aquatic motor competence	Pre	3.18	.40	1.03	2.98	.28	-.10
	Post	3.15	.29		3.08	.38	
Aquatic motor ability	Pre	2.52	.32	-2.35*	2.45	.15	-.12
	Post	2.87	.23		2.57	.13	

### DIFFERENCES IN INTER-GROUP POST-TEST

The non-parametric test for independent samples (U de Mann-Whitney), showed significant differences, which favored the experimental group in the variable aquatic motor ability ( $U = 89.45, p < .01$ ).

## DISCUSSION

To date, there have been few studies published which relate the use of methodologies based on symbolism to aquatic motor competence and ability in children. Furthermore, in the last few years, numerous attempts have been made in research to bring back the educational entertainment tradition as a source of didactic interest on all levels of human development (Méndez-Giménez and Fernández-Río, 2011; Muñoz, 2011; Trigueros, 2009). Consequently, this study analyzed the role of motor stories as an educational resource in promoting aquatic motor competence in children in the second cycle of pre-school education.

The results of this study show that children who have experienced aquatic motility stories have a greater perceived aquatic motor ability; that is to say, they show more willingness and confidence towards the aquatic medium than the control group. In the first place, we believe that this result is a consequence of including the aquatic medium as an educational resource, which as indicated above has been recommended in several studies (Casterad, 2003). Secondly,

we believe it is because of the nature of the educational proposal established, since according to some authors (Méndez-Giménez and Fernández-Río, 2011) the interconnection between the tools of the educational entertainment tradition and different areas of knowledge contributes to the development of basic educational competencies. Nevertheless, in spite of the numerous attempts to bring back this entertainment content, Ruiz (2011) points out that instead of focusing on structural aspects, the experiential processes of the entertainment activity should be focused on more. In this sense, aquatic educators could consider motility stories in the aquatic medium (Martínez and Moreno, 2011; Muñoz, 2006; 2007) as a useful instrument to help participants' improve their perceived aquatic motor ability, since from this autotelic perspective a person is wholly implicated through their corporeality and motility, and through being continually active and in contact with the experiences provided by the representations. In this same line, for Ruíz (2011) motility stories contribute to modifying the foundations of participants' personal identity, because they refer to people who listen, talk, know, laugh, experience emotions and feelings and interact with others.

On the other hand, the results of this study did not show differences in participants' real motor competence in either group. In spite of the fact that a practical context, where children see themselves encouraged to search for the many varied motor solutions to the different problems presented, could favor motor competence, as some studies indicate (Fernández-Río and Velázquez, 2005), our data did not corroborate this idea. For this reason, we think that the true potential of including aquatic motility stories in the pre-school stage lies in the improvement of perceived motor ability and the motivational aspects that sustain it. It is possible, however, that a continuous and systematic administration of this type of program over a longer period of time than the one in this research could positively contribute to the improvement of real motor competence. Positive motor self-perception, which this practice assumes, could lead to an increase in the intention to go on practicing, and consequently achieve an improvement in a person's real motor ability.

Therefore, the originality and real practical contribution of this study is the discovery that practice through motility stories could favor an improvement in children's perceived aquatic motor ability, through an increase in the feeling of confidence in their own abilities. Through this medium, we would help with the development of breathing, floating, propulsion, throwing, catching, jumps and turns, balance, laterality, relaxation and bodily schema, without forgetting cognitive, social and emotional aspects (Moreno, 1999; Moreno, Pena, and del Castillo, 2004).

Furthermore, during the pre-school and primary stages the connection between motor development and cognoscitive development is of particular importance, as this is a time when a person's social behavior (the expressive and communicative character of the body facilitates and enriches interpersonal relations) and interests and attitudes start to become defined (Da Fonseca, 2006). Apart from these aspects, including these types of practices in a center's curriculum could contribute to an increase in the quality of activities as perceived by students, and avoid their dropping out of sport at a later age



(Nuviala, Tamayo, y Nuviala, 2012). Motility stories can therefore acquire a high educational value because of the possibilities of exploring the environment itself and for the logical relations that are favored through interactions with objects, with the environment, with other people and oneself. It should not be forgotten that motor play is one of the principal mechanisms for relations and interaction with others, and it is during these stages that they have a more important role. Therefore, based on how children are attracted by what is magical and fantasy, and especially on the awareness of their need for movement, expression and interaction with everything that surrounds them, the symbolic presentation of motility stories aims to develop a significant teaching method for aquatic skills suited to children's needs, characteristics and interests (Moreno and Martínez, 2010; Muñoz, 2006; 2007).

Acquiring these skills aims to generate children's willingness to do aquatic activities in the future, and consequently a good perception of aquatic motor competence is generated, contributing to a healthy self-concept. Adults, attending and participating with children in their own discovery of this competence, become a fundamental link in this process. Future research made with larger samples and a longer intervention time would be necessary to confirm the results obtained in this research. Therefore, including motility stories in teaching aquatic motor skills could constitute a useful tool, not only to consolidate aquatic learning itself, but also as a new focus, which through symbolism and globalization, would contribute to a healthy and adaptive infant self-concept

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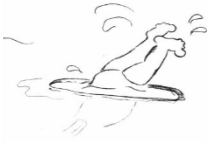







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### Annex I. Experimentation test

Skill	Graphic image	Evaluation criteria
1. Dive head first		<p>A. Head doesn't go through ring</p> <p>B. Head goes through ring without jumping</p> <p>C. Dives head first through ring and touches it</p> <p>D. Dives head first through ring and doesn't touch it</p>
2. Immersion		<p>A. Doesn't pick up the ring</p> <p>B. Picks up ring with monitor's help</p> <p>C. Picks up ring by support on pool rail</p> <p>D. Picks up ring without help</p>
3. Swim on back		<p>A. Moves without monitor's help</p> <p>B. Moves with support of float</p> <p>C. Moves alone but goes under</p> <p>D. Moves alone</p>
4. Places ring		<p>A. Doesn't place ring</p> <p>B. Places ring with support on pool rail</p> <p>C. Places ring after several attempts</p> <p>D. Places ring without help</p>
5. Balance on airbed		<p>A. Doesn't put foot on airbed</p> <p>B. Puts foot on airbed and falls</p> <p>C. Puts foot on airbed but has difficulty keeping balance</p> <p>D. Walks on airbed with good balance</p>
6. Jump from airbed to go after 'the treasure'		<p>A. Doesn't jump (doesn't fall)</p> <p>B. Jumps but very close to airbed</p> <p>C. Jumps forward but doesn't pick up floating object</p> <p>D. Jumps and reaches floating object</p>
7. Swim on front		<p>A. Moves with monitor's help</p> <p>B. Moves but doesn't breath (swims underwater)</p> <p>C. Moves but has to stop to rest</p> <p>D. Moves without help</p>
8. Place object in bucket		<p>A. Places object with monitor's help</p> <p>B. Places object with support of pool edge</p> <p>C. Throws object towards bucket but it doesn't go in</p> <p>D. Throws object without help and gets it in the bucket</p>