

Cultural influence in the development of functional independence

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Abstract: Introduction: The occupational therapy discipline considers cultural aspects as keys to understanding the performance and development. Objective: To compare occupational performance among healthy children aged 3 and 7 years in daily life activities in different countries. Method: This is a comparative study, from Spain, Norway and Taiwan. We used the Pediatric Evaluation of Disability Inventory (PEDI) scale of functional skills. Data from the three countries were compared using the Welch unpaired test. Results: The results show that there are significant differences between the three samples in all domains of the PEDI functional scales and for all age groups. Taiwanese children scored higher than Spanish and Norwegian children; and Spanish children scored higher than Norwegians in all of the PEDI functional domains. Conclusion: Culture has a decisive role in the development patterns of skills for acquiring independence in ADLs. Before planning an intervention, occupational therapist should take into account different cultural related issues.

Keywords: *Independence, Culture, Child Development, Activities of Daily Living.*

Influencia de la cultura en el desarrollo de la independencia funcional

Resumen: Introducción: Los aspectos culturales son considerados desde la disciplina de la Terapia Ocupacional como claves para entender el desempeño y el desarrollo. Objetivo: comparar el desempeño ocupacional entre niños sano con edades entre 3 y 7 años, en las actividades de la vida diaria entre diferentes países como son España, Noruega y Taiwán. Método: Se trata de un estudio comparativo entre España, Noruega y Taiwán. Ha utilizado la escala de habilidades funcionales del Pediatric Evaluation Disability Inventory (PEDI). Posteriormente se han comparado los datos de los tres mediante el uso de la prueba t no pareada de Welch. Resultados: Los resultados muestran diferencias significativas entre las tres muestras en todos los dominios de las escalas funcionales del PEDI y para todos los tramos de edad. Los niños taiwaneses puntúan más que los niños españoles y noruegos, y los españoles más que los noruegos en todos los dominios del PEDI. Conclusion: La cultura influye de forma determinante en los patrones de desarrollo en las habilidades relativas a la adquisición de la independencia en las AVDs. Antes del desarrollo de una intervención, el terapeuta ocupacional deber tener en cuenta las diferentes cuestiones relacionadas con la cultura.

Palabras clave: *Independencia, Cultura, Desarrollo Infantil, Actividades de la Vida Diaria.*

Influência da cultura no desenvolvimento da independência funcional

Resumo: Introdução: Aspectos culturais são considerados a partir da disciplina de terapia ocupacional como chaves para a compreensão do desempenho e do desenvolvimento. Objetivo: comparar o desempenho ocupacional entre as crianças saudáveis, com idades entre 3 e 7 anos, nas realização de atividades da vida diária (AVD) entre diferentes países. Método: Estudo comparativo a partir de dados da Espanha, Noruega e Taiwan. Foi utilizada a escala de habilidades funcionais da *Pediatric Evaluation Disability Inventory* (PEDI). Foi feita a comparação dos dados dos

três países, utilizando o teste não pareado Welch. Resultados: Os resultados mostram diferenças significativas entre as três amostras em todos os domínios de escalas funcionais de PEDI e para todas as faixas etárias. Crianças de Taiwan pontuaram mais do que as crianças espanholas e norueguesas, e crianças espanholas tiveram *score* mais elevado do que os noruegueses em todos os domínios funcionais do PEDI. Conclusão: A cultura está muito ligada aos padrões de desenvolvimento em habilidades para a aquisição de independência em AVD. Antes do planejamento de uma intervenção, o terapeuta ocupacional deve levar em conta diferentes questões relacionadas com a cultura.

Palavras-chave: *Independência, Cultura, Desenvolvimento Infantil, Atividades de Vida Diária.*

1 Introduction

The exercise of occupational therapy can be defined as a carefully orchestrated dance of the dynamic properties of human and non-human environments that provide meaning and purpose to a person's life (MASAGATANI, 1998, p. 147).

The culture guides and drives the activities of members of a given society (FLORES MARTOS, 2006) becoming a key dimension to analyze the occupational behavior that is the object of Occupational Therapy (OT). The culture does not simply define what a person chooses to do, but also the meaning and interpretation of one's and others' actions (MATTINGLY; BEER, 1998). Thus, studies on the influence of culture are necessary to understand the person's behavior throughout his or her life cycle.

The Person, Environment and Occupational Performance Model (LAW et al., 1996) estimates that the ability to carry out occupational performance is influenced by personal aspects - such as body functions and structures, beliefs and values of the occupation such as objects and their characteristics, social demands, rhythm and by the environment that encompasses socioeconomic, cultural, physical and social contexts. From this model, it is understood that the environment provides the context for the person to carry out his occupational performance, and both, performance and environment, influence each other. The environments in which the person is located are not static but are constantly changing, which implies that behaviors or conducts that are shown through performance also change (RIGBY; LETTS, 2003) and that change has to be observable.

The influence of the environment reaches the child through the microsystem (in Bronfenbrenner terms), that is, through beliefs, behavior patterns, values, lifestyles, among others that make up the macro-system (CÓRDOBA IÑESTA, 2008). Thus, the culture shows the relationships between adults and children, guiding the psycho-social processes of

parenting, that is, patterns, practices, and beliefs about parenting (PARMAR; SUPER, 2004; IZZEDIN; PACHAJOA, 2009; CHUA, 2011). How parents favor THE independence, deal with the teaching of skills or exercise the discipline are key elements that condition the child's performance. If the choice of parents may vary as a particular cultural context, it is expected that there will be differences in the achievement of abilities by the child in his or her performance. Thus, Case-Smith and Clifford O'Brien (2010) reflect on the determinants of children's occupations of ideas of interdependence or autonomy and exemplify differences between cultures that illustrate how they affect daily activities such as sleeping. Also, Adair et al. (2004) find cultural differences in beliefs about hygiene habits. Likewise, cultural patterns and patterns of parenting and developmental goals that parents propose for their children operate in a multidimensional context that enhances or hinders the child's occupational performance. These factors include biology, physical environment, family structure, parental work, relationships between groups, and the economy of the society (GREENFIELD; SUZUKI, 1998).

This study aims to compare the data of different samples, a Spanish, a Norwegian and a Taiwanese samples to verify the existence or not of differences in occupational performance in the activities of daily life of young children living in different cultural contexts, starting from the hypothesis that the performance of the three groups is different since cultural differences are important.

2 Method

2.1 Design and participants

This is a comparative study (meta-analysis) between the results of three studies conducted in Spain, Norway, and Taiwan. It is a sample of 530 healthy children between 3 and 7 years old, without any alteration of development, collecting data on independence in activities of daily living were collected through PEDI. The inclusion and

exclusion criteria of each of the subsamples are described by the respective authors and published in the corresponding papers (BERG et al., 2008; CHEN et al., 2010; SANTAMARÍA VÁZQUEZ, 2014), all of which coincide that children have no diagnosis that affects development and meets the age criteria.

The demographic data for each of the Norwegian, Taiwanese and Spanish samples are also those specified in the previous papers, having no access to the databases of the Norwegian and Taiwanese works. In Table 1, the sample size of each study divided by age group is specified.

2.2 Instrument

To evaluate the functional performance of children's daily activities (ADLs), the Pediatric Evaluation Disability Inventory (PEDI) functional skills scale has been used (HALEY et al., 1992). This scale is divided into three domains: personal care, mobility, and social function. The personal care domain contains 73 items that collect information about a child's ability to perform activities such as eating, dressing, combing, or brushing their teeth. The mobility domain includes 59 items where, for example, the child can walk, carrying objects or going up and down stairs. Finally, the domain of a social function with 65 items, focuses on the ability to understand sentences and words, interactions during playing, collaboration on household tasks or functioning within the community among others.

All domains are scored on a dichotomous scale, where 1 is scored when the child can perform the task described in each of the items without help, and 0 when the child is not able to do it or needs help. On the one hand, a score is obtained for each of the domains resulting from the sum of those items where the child has been identified as capable, and an overall scale score with the sum of the scores of the three domains.

The PEDI has been translated into Norwegian, Taiwanese and Spanish, and its psychometric properties have been analyzed by different authors,

obtaining adequate psychometric properties in all cases (BERG et al., 2004; CHEN et al., 2009; GARCÍA BÁSCONES, 2013).

2.3 Procedure

After the data collection of the three publications, statistical analyses were performed, and results were analyzed, considering the following study variables:

- Personal care. This variable is defined as the average score obtained in the personal care domain of the PEDI Functional skill scales. This variable is established by age group.
- Mobility. This variable is defined as the average score obtained in the mobility domain corresponding to the functional skills scales of the PEDI. This variable is established by age group.
- Social function. This variable is defined as the average score obtained in the social function domain within the functional skills scales of the PEDI. This variable is established by age group.
- Personal care SD. This variable is the result of the standard deviation obtained in the personal care domain of the PEDI Functional Skills scales. This variable is established by age group.
- Mobility SD. This variable is the result of the standard deviation obtained in the mobility domain of the functional skills scales of the PEDI. This variable is established by age group.
- Social function SD. This variable is the result of the standard deviation obtained in the social function domain of the functional skills scales of the PEDI. This variable is established by age group.

All three studies report that all ethical principles have been respected and data protection standards have been followed.

Table 1. Some sample size, by country and by age group.

	Age groups (years/months/days)							Total
	3/0/0 3/5/30	3/6/0 3/11/30	4/0/0 4/5/30	4/6/0 4/11/30	5/0/0 5/5/30	5/6/0 5/11/30	6/0/0 6/5/30	
Spain n	17	34	40	47	25	31	5	199
Norway n	16	18	18	18	24	22		116
Taiwan n	38	34	37	35	30	38	35	215

2.4 Statistical analysis

Data of means and standard deviations have been taken from the age ranges established in the PEDI manual (HALEY et al., 1992) of the three subsamples (described and specified in each of the three documents), and these results have subsequently been compared with the three subsamples with each other.

To determine whether there were significant differences between the samples, the Welch's unpaired t test was used, which assumes the normal

distribution of the population, unknown and different variances, since only sample size and mean and standard deviation data of the Norwegian and Taiwanese samples. The t-test has been done with free GraphPad software, available on the internet.

3 Results

The data on the scores obtained in each domain by the three samples are presented in Tables 2-4. The data shown on Norway and Taiwan are those obtained by Berg and Chen respectively (BERG et al.,

Table 2. statistics of the three samples in the Personal Care domain of the *PEDI Functional Skills Scale* (HALEY et al., 1992).

Age years/ months/days	<i>Personal care domain</i>					
	Norway		Taiwan		Spain	
	Mean	SD	Mean	SD	Mean	SD
3/0/0	40.4	6.7	64.3	7.9	569	7.55
03/05/1930						
03/06/2000	37.6	8.1	67.3	4.9	58.02	5.82
03/11/1930						
4/0/0	36.7	6.1	74.0	5.6	61.9	5.17
04/05/1930						
04/06/2000	37.9	11.0	74.5	6.2	65.21	3.57
04/11/1930						
5/0/0	40.3	5.4	78.3	7.0	64.6	3.5
05/05/1930						
05/06/2000	39.2	5.4	78.4	10.6	66.29	3.48
05/11/1930						
6/0/0			82.6	9.0	69.6	4.15
06/05/1930						

Table 3. Descriptive statistics of the three samples in the Mobility domain of the of the *PEDI Functional Skills Scale* (HALEY et al., 1992).

Age years/ months/days	<i>Mobility domain</i>					
	Norway		Taiwan		Spain	
	Average	SD	Average	SD	Average	SD
3/0/0	40.8	5.0	82.4	6.3	54.29	1.49
03/05/1930						
03/06/2000	41.2	4.5	84.0	8.1	53.8	1.48
03/11/1930						
4/0/0	40.4	6.4	86.8	6.0	54.9	1.54
04/05/1930						
04/06/2000	38.5	10.5	90.7	6.9	55.48	1.26
04/11/1930						
5/0/0	49.8	9.1	93.6	6.7	56.5	1.44
05/05/1930						
05/06/2000	41.3	12.5	95.7	4.8	56.48	1.43
05/11/1930						
6/0/0			97.2	4.3	56.6	1.14
06/05/1930						

2008; CHEN et al., 2010). These data have been used for comparison with the results among the three countries, through the calculation of the Welch t-test.

Figure 1 shows the means obtained by age group in the different domains of the PEDI Functional Skills scale.

Welch's t-test results show statistically significant differences in the comparison between the Spanish, Norwegian and Taiwanese samples (see Tables 5-7) for functional abilities. The meaning of these differences can be seen in Figure 1. Taiwanese children score higher in all domains than the Spanish and Spanish scored more than the Norwegian children. The curves follow different trajectories because the magnitude of the differences is not constant in the age range studied. However, the achievement of the Taiwanese children is greater than the Spanish and Norwegians.

4 Discussion

The results of this study show that the culture directly influences the development of independence in activities of daily living, even in European countries such as Spain and Norway. Addressing the reason for these differences is complex because of the number of factors that make up the environment and culture.

Different policies as raising and reconciling family life may be the cause of these mismatches. The Nordic countries are considered the best countries in the world to raise a child according to different reports (SAVE THE CHILDREN, 2013, 2014), establishing the generosity of social policies regarding maternity as one of the criteria, which include benefits in return for taking care of the children. The presence of the mother at home may be one of the causes for acquiring the habits of independence in ADLs later, since, in this sense, Taiwanese researchers argue the incorporation of

Table 4. Descriptive statistics of the three samples in the Social Function domain of the PEDI *Functional Skills scale* (HALEY et al., 1992).

Age Years/ months/days	Social Function domain					
	Norway		Taiwan		Spain	
	Mean	SD	Mean	SD	Mean	SD
3/0/0	47.3	4.6	61.4	5.1	50.70	3.67
03/05/1930						
03/06/2000	44.8	5.2	65.2	5.8	50.73	4.25
03/11/1930						
4/0/0	43.7	6.5	66.6	4.9	54.35	3.74
04/05/1930						
04/06/2000	43.1	12.1	69.0	5.1	55.23	3.23
04/11/1930						
5/0/0	45.0	6.1	74.8	8.1	57.16	2.67
05/05/1930						
05/06/2000	43.4	6.7	73.3	8.4	57.12	2.78
05/11/1930						
6/0/0			77.9	9.0	56.8	3.76
06/05/1930						

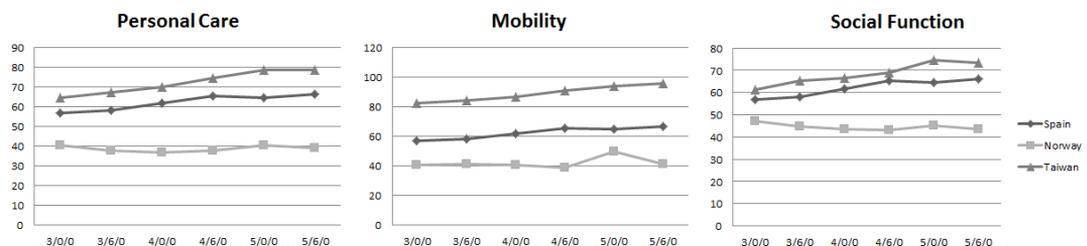


Figure 1. Graphic representation of the scores obtained by the Spanish, Norwegian and Taiwanese samples.

Table 5. Results of the Welch t-test, comparing the Spanish sample with Norway sample.

Age years/ months/ days	<i>Personal Care domain</i>				<i>Mobility domain</i>				<i>Social Function domain</i>			
	t	p	Difference	EE	t	p	Difference	EE	t	p	Difference	EE
3/0/0	6.64	.0001	16.5*	2.48	10.29	.0001	13.4	1.3	2.35	.0258	3.4	1.44
03/05/1930												
03/06/2000	9.48	.0001	20.42	2.1	11.55	.0001	12.60	1.09	4.13	.0003	5.9	1.42
03/11/1930												
4/0/0	15.23	.0001	25.2	1.65	9.48	.0001	14.5	1.58	6.4	.0001	10.65	1.64
04/05/1930												
04/06/2000	10.32	.0001	27.30	2.64	6.80	.0001	16.90	2.48	4.19	.0006	12.13	2.89
04/11/1930												
5/0/0	18.60	.0001	24.3	1.30	3.5	.0015	6.72	1.88	8.9	.0001	12.16	1.35
05/05/1930												
05/06/2000	20.6	.0001	27	1.3	5.66	.0001	15.18	2.67	9.06	.0001	13.72	1.51
05/11/1930												

*The differences in means are expressed in positive means that the Spanish population scores higher.

Table 6. Results of the Welch t-test, comparing the Spanish sample with the Taiwanese sample.

Edad years/ months/ days	<i>Personal Care domain</i>				<i>Mobility domain</i>				<i>Social Function domain</i>			
	t	p	Difference	EE	t	p	Difference	EE	t	p	Difference	EE
3/0/0	3.3	.002	-7.4*	2.23	25.36	.0001	-27.50	1.08	8.89	.0001	-10.70	1.203
03/05/1930												
03/06/2000	7.12	.0001	-9.28	1.30	21.37	.0001	-30.18	1.41	11.73	.0001	-14.47	1.23
03/11/1930												
4/0/0	7.2	.0001	-8.10	1.12	31.39	.0001	-31.9	1.01	12.25	.0001	-12.25	.999
04/05/1930												
04/06/2000	7.9	.0001	-9.29	1.17	29.82	.0001	-35.22	1.18	14.01	.0001	-13.77	0.98
04/11/1930												
5/0/0	9.4	.0001	-13.7	1.45	29.5	.0001	-37.08	1.25	11.21	.0001	-17.64	1.572
05/05/1930												
05/06/2000	6.6	.0001	-12.11	1.83	47.83	.0001	-39.22	0.82	11.14	.0001	-16.18	1.45
05/11/1930												
6/0/0	5.4	.0003	-13.00	2.4	45.73	.0001	-38.76	0.88	9.58	.0001	-21.1	2.21
06/05/1930												

*Que las diferencias de medias se expresen en negativo, significa que la población española puntúa más bajo.

Table 7. Resultados de la prueba t de Welch, comparando la muestra noruega con la taiwanesa.

Edad years/ months/ days	<i>Personal Care domain</i>				<i>Mobility domain</i>				<i>Social Function domain</i>			
	t	p	Diference	EE	t	p	Diference	EE	t	p	Diference	EE
3/0/0	10.5	.0001	-23.9*	2.25	23.44	.0001	-41.6	1.77	9.5	.0001	-14.1	1.47
3/5/30												
3/6/0	16.49	.0001	-29.7	1.8	20.72	.0001	-42.8	2.06	12.5	.0001	-20.4	1.63
3/11/30												
4/0/0	22.5	.0001	-37.3	1.65	26.33	.0001	-46.4	1.76	14.58	.0001	-22.9	1.57
4/5/30												
4/6/0	15.5	.0001	-36.6	2.35	26.88	.0001	-52.2	1.94	10.97	.0001	-25.9	2.36
4/11/30												
5/0/0	21.8	.0001	-38	1.73	20.36	.0001	-43.8	2.15	14.9	.0001	-29.8	1.99
5/5/30												
5/6/0	16,3	.0001	-39.2	2.42	24.5	.0001	-54.4	2.26	14.25	.0001	-29.9	2.09
5/11/30												

*The mean differences are expressed in negative means that the Norwegian population scores lower.

the Taiwanese woman into the World of work as a reason for their results (CHEN et al., 2010).

Another factor to consider, beyond family policies, are parenting styles. Western and Eastern parenting styles are different as shown by Amy Chua in her essay “Mothers Tigers, Sons Lions” (2011). Eastern culture seems to be more demanding and less permissive than Western cultures, which is related to the so-called “parental ethnic-theory”. This concept refers precisely to the influence of culture on how to exercise paternal and maternal roles, and that for example, to Western parents attribute a greater concern in the game, since they see in the game a potential of opportunities to favor development, while the Eastern parents focus more on academic tasks (PARMAR; SUPER, 2004). Along the same lines, Wise and Da Silva (2007) argue that parents give independence different values depending on the culture from which they come. In the specific case of habits related to tooth care, Adair et al. (2004) found that there were significant differences in beliefs about the control exercised over their children in both the number of brushings per day and the importance of doing it between countries such as Belgium and Norway with China.

Gross-Loh (2013) reviews the evaluation of parents of issues related to socialization, participation in activities outside the home or independence, showing for example that parents from countries such as Spain and Norway do not spend the same time to go with children to playgrounds, or in countries of Eastern culture like Taiwan, parents attach great importance to group activities because of the influence of the collectivist culture.

Another of the arguments to be considered to explain these differences is related to the knowledge that parents have about the development of their children. Several studies have shown that the greater the knowledge about development, the easier to accompany the children in this process and help them to acquire their skills (DICHTELMILLER et al., 1992; RIKHY et al., 2010; STEVENS, 1984). Regarding Spain, and about the process of acquiring independence in ADLs, it is even difficult to find scientific texts validated in the country that offer a clear criterion of the age at which it is considered appropriate to acquire the different skills related to the autonomy. For this reason, it is not surprising that Spanish parents suffer precisely from an adjusted criterion of when their children should perform certain activities, hindering to guide them to achieve greater independence.

On the other hand, it is necessary to address the physical environment, which Law et al. (1996) as Rigby and Letts (2003) insist on their role as a performance shaper. On this topic, although it is not possible to provide concrete data, the observation of images of everyday life (houses, parks, schools, etc.) of the three countries studied reflects different physical contexts (types of beds, presence of stairs inside the home, etc.) that may have influenced the basis of development.

There are many questions that can be analyzed, but the results of this work show that the age at which the different milestones related to the development of independence in ADLs are acquired, is conditioned by the country of origin, and the culture is a determining value in the development of autonomy in the child.

This is especially important when evaluating development with evidence created in different cultural contexts, and not only a process of translation and cultural adaptation but also an analysis of the applicability of the normative values of the source population and target population.

Comparing results of studies in which it is not known that the same variables have been controlled, it is accepted that it is an important limitation of this study. Nevertheless, it is a relatively frequent practice since it allows to detect indications that will be able to verify later investigations. The results presented indicate differences between different populations and in what sense these differences go. Therefore, it is necessary to design studies that confirm if these differences are due to different patterns of parenting, the parents’ assessment of socialization or the independence of their children or other factors, such as the timing, socio-economic conditions of the parents or the country, ensuring a good control of the sample and the variables studied. Therefore, the methodology used is one of the limitations of this study, and a deeper analysis would be necessary, using a more qualitative methodology that allows delving into the different issues mentioned above.

5 Conclusions

The culture has a decisive influence on developmental patterns in the skills related to the acquisition of independence in ADLs, as demonstrated by the significant differences found in the Spanish, Norwegian and Taiwanese populations. Occupational Therapy interventions in childhood should consider issues such as the importance that parents give

to their children's independence, the parenting styles of each family unit, as well as the physical environment. On the other hand, it cannot be said that these studies have been carried out in social and cultural contexts that are comparable. Therefore, it would be desirable for cross-cultural studies to be carried out by research groups to ensure that samples, procedures are homogeneous and that the only differentiating factor is culture. It would also be interesting to carry out studies to compare the development of occupations in different cultural contexts, as well as work on the creation of tools that already consider these issues.

As a limitation of this study, the data that are compared have been collected by three different teams, and there is no guarantee of control over the sample and the lack of research studies that analyze in depth the differences between the theories Ethno-parental or the development environments, being necessary a more qualitative methodology that allows deepening more.

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Author's Contributions

Montserrat Santamaría-Vázquez: analysis of the results, writing of the text. Valeriana Guijo-Blanco: project management, writing and review of the text. All authors approved the final version of the text.