

Physical Activity and Self-concept in Bilingual and Non-bilingual Schools: An Analysis through Structural Equations

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ABSTRACT: The aim of this study is to analyse, define and contrast a model that explains the concept of self-awareness and teenagers' attitudes towards Physical Education (P.E.). Using multi-group structural equations, the study also delves deeper into the links between the concept of self and attitudes of learners toward the physical education teacher according to the type of school (bilingual or non-bilingual). The total sample was made up of 2,388 teenage students aged between 11 and 17 (1,151 bilingual and 1,237 non-bilingual). The students responded to a socio-demographic questionnaire, a self-concept test, and a test dealing with Attitude toward Physical Education, to analyse the level of teaching of the foreign language in addition to aspects pertaining to the subject of physical education and the degree of concept of self or self-awareness. The results indicate higher levels of influence of the academic aspect in PE training in bilingual schools, whereas in non-bilingual contexts, it is the physical dimension that is rated more positively. Similarly, the data points to a positive and direct link between the overall concept of self in teenagers, with sense of empathy toward the teacher and value placed on the subject of physical education in students attending bilingual schools.

Keywords: Self-Concept; Bilingualism; Teenagers; Physical Education

Actividad física y autoconcepto en centros bilingües y no bilingües: Un análisis mediante ecuaciones estructurales

RESUMEN: El presente estudio tiene como objetivos analizar, definir y contrastar un modelo explicativo sobre el autoconcepto y la actitud hacia la educación física en adolescentes. Utilizando análisis de ecuaciones estructurales multigrupo, el estudio también analiza las relaciones existentes entre el autoconcepto y la actitud hacia el profesor de educación física en base al tipo de centro en donde estudian los adolescentes (bilingüe o no). La muestra está formada por 2.388 adolescentes de entre 11 y 17 años (1.151 bilingües y 1.237 de centros no bilingües). Se aplicó un cuestionario de tipo sociodemográfico, el test de autoconcepto y un cuestionario de actitud hacia la Educación Física con el fin de analizar el nivel de enseñanza de lengua extranjera, aspectos relacionados con la asignatura de educación física y el nivel de autoconcepto.

Los resultados depararon una alta influencia del aspecto académico de los adolescentes en los centros bilingües, mientras que, en el caso de los no bilingües, es la dimensión física la más valorada. Asimismo, los datos establecen una asociación positiva y directa entre el autoconcepto general de los adolescentes, la empatía con el profesor y la valoración hacia la asignatura de educación física en los alumnos que estudian en centros educativos bilingües.

Palabras Clave: Autoconcepto; Bilingüismo; Adolescentes; Educación Física

1. INTRODUCTION

Bilingual education is now a reality in schools in Spain, where its beneficial results are notable (Boldizsár, 2003; Durán & Beltrán, 2016) both from the point of view of the student's learning process and from the perspective of their overall training as autonomous individuals, which is a cornerstone of all the initial stages of education (Halbach, 2008). When we define bilingual education in its widest sense and broadest scope, we talk about implementing a syllabus where two languages are used to teach various academic subjects (Madrid & Corral-Robles, 2018).

By integrating bilingualism into the school system, knowledge is elevated to a higher status on the list of the perceived needs of the students by underlining the importance of communication skills and control of a foreign language. The value of knowing a foreign language is perceived as a need in order to achieve success in the new contexts of our present society (Gómez, Solaz & Sanjosé, 2014). In the present language learning process, it is considered basic to take into account aspects relating to intercultural sensitivity and sociolinguistics (Frank, 2000; González, 2015). One of the key elements in this process is that speaking various languages allows for greater cooperation, mobility and understanding between European citizens (Boldizsár, 2003).

Of the many factors that come into play when studying a foreign language, several authors, for instance, Rodríguez-Parra, Buiza, Adrián & Alegría (2012) and Castejón (2014), have singled out certain parameters that have a bearing on the learning process. These variables include external elements such as setting, context and situation, and internal elements, like the mother tongue, world knowledge and linguistic know-how; others are individual factors, such as age, motivation and aptitude, among others (García-Sánchez & Cruz, 2013; Pérez-Puente, 2006; Ramos, 2011). Another aspect that weighs heavily on the learning process is the kind of demands placed on Primary and Secondary school teachers for them to be permitted to participate in bilingual programmes, at the level of language proficiency and at the level of the knowledge needed of the subjects that are studied in English (Durán, 2018).

In the case of the students, a further consideration of importance is the image that a person has of him/herself (self-esteem or self-awareness), which is of interest both at an individual and a collective level. Over the last few years, international research has offered significant insights into self-concept, affording a greater understanding of this fundamental aspect of education (García & Musitu, 1999; Wilkins, Butt, Kratochvil & Balakrishnan, 2016). The subject has been examined in a wide variety of studies, some of which have analysed social aspects (Goñi & Fernández, 2007; Fernández-Zabala, Rodríguez-Fernández & Goñi, 2016), others emotional perspectives (Jiménez-Morales & López-Zafra, 2008), and others still academic performance (Gargallo, Garfella, Sánchez, Ros & Serra, 2009; Lohbeck, Nitkowski & Petermann, 2016), psychological insights (Flores, Medrano & Manoiloff, 2014; Gámez, Díaz, Marrero, Galindo & Breva, 2014) or physical and sport influences (Goñi, Madariaga, Axpe & Goñi, 2011; Zurita, Castro-Sánchez, Álvaro, Rodríguez & Pérez, 2016). Virtually all the researchers agree that attitudes, behaviour and the learning processes acquired during the teenager years and post-teens have a weighty bearing on later adult life (González-Valero, Zurita-Ortega & Martínez-Martínez, 2017; Castro-Sánchez, Zurita-Ortega, García-Mármol & Chacón-Cuberos, 2019).

The teacher is a key element in second-language learning (Morales, Calvo & Bialystok, 2013; Hoffmann, 2014) and, together with the family, constitutes a decisive factor in the learning process (González-Pienda, Núñez-Pérez, González-Pumariiega, Álvarez, Rocés & García, 2002; Castejón, 2014). Thus, studies focus ever more on how learning can be enhanced and what new methodologies can be deployed to positively favour the acquisition of a second language.

Bilingualism and physical education have been the focus of much research (Amor & Pascual, 2012; Salvador, Chiva & Fazio, 2016; Hernández-Garijo, Hortigüela & Pérez-Pueyo, 2018; García-Calvo & Salaberri, 2018) and indicate how action and performance, games and mimicry can improve foreign language learning, always factoring in the significance of context and the possibility of promoting psycho-social, emotional and neuro-motor aspects.

There are few contrastive studies, however, in the context of physical education training in a second language or the potential emotional, social, physical, family and academic benefits of the same as opposed to non-bilingual physical education training. This article, then, aims to define and contrast a model that explains concept of self and attitude toward physical education in teenagers, together with the links between them depending upon the type of school (bilingual or non-bilingual), using multi-group structural equation analysis.

2. MATERIAL AND METHODS

2.1. Participants

This cross-sectional descriptive research study had a total of 2,388 participants aged between 11 and 17 (Average = 13.85 years old; SD= 1.268), 1,036 of whom were male (43.39%) and 1,352 female (56.61%), with 1,151 students from bilingual (48.2%) and 1,237 from non-bilingual (51.8%) schools. The participants were spread over eight cities in Andalucía (Spain), all of them public and charters schools under the same bilingual policy. There are two sessions of one hour each in all of these schools. The sample was obtained via a convenience sampling of Spanish teenagers. It should be noted that 281 mistakenly completed questionnaires were eliminated from the final analysis.

2.2. Tools

Three tools were used to carry out this investigation. The first was a socio-demographic questionnaire, where we defined the subjects' gender (male or female) age, physical activity, type of educational centre (bilingual or non-bilingual) and whether the academic subject of physical education was given in English or in some other language.

The second questionnaire to be completed was an *Autoconcepto Forma 5* (AF5), based on that designed by García & Musitu (1999). This tool builds on the theoretical model of Shavelson et al. (1976) and is made up of 30 questions grouped together over five dimensions: academic aspects (items 1, 6, 11, 16, 21 and 26), social considerations (items 2, 7, 12, 17, 22 and 27), emotional perspectives (items 3, 8, 13, 18, 23 and 28), family bearing (items

4, 9, 14, 19, 24 and 29) and the physical dimension (items 5, 10, 15, 20, 25 and 30), each of which was measured with a Likert scale from 1 (“never”) to 5 (“always”). This type of response was an adaptation, based on originals from, among others, Salum-Fares, Marín & Reyes (2011) and Zurita et al. (2016). In our study, the Cronbach alpha was 0.875.

The third tool used was a test of Attitude toward Physical Education as designed by Moreno et al. (2003). The test is made up of 56 items that evaluate interests and attitudes of PE students on a Likert scale of 1 to 4 where, 1 represents total disagreement and 4 corresponds to total agreement. The analysis is designed over seven dimensions: the evaluation of the subject and the teacher of Physical Education (items 6, 10, 17, 18, 21, 30, 37, 38, 43, 51 and 55), the difficulty of Physical Education (items 4, 11, 19, 26, 36 and 44), the usefulness of Physical Education (items 1, 5, 12, 15, 16, 31, 32, 35, 40 and 42), empathy felt toward teacher and subject (items 2, 3, 7, 8, 23 and 48), concordance with organisation of the subject (items 13, 14, 24, 52 and 54), preference for Physical Education and Sports (items 20, 28, 34 and 50) and Physical Education as Sport (items 25, 45, 47 and 49). The Cronbach’s alpha in our study was 0.902.

2.3. Procedures

The questionnaires were distributed in class after receiving the students’ informed consent and completed in groups under the supervision of the researchers who had been previously trained to that end. The students first received instructions where they were told that their privacy would be safeguarded, and the ends to which the results were to be used. The participants were not informed of the main objective of the study in order to preclude insincere responses or social bias. The study was approved by the Ethics committee at the University of Granada (Code 641/CEIH/2018).

2.4. Data Analysis

IBM SPSS® (version 22.0 for Windows) Statistical Analysis Software was used to give the basic descriptive analyses. IBM AMOS® 23 was used to analyse the links that existed between the implied constructs of the structural model. Once the theoretical model had been developed, a route analysis was carried out where matrix links were considered working on the basis of multi-group analysis with gender as the defining group variable. As such, two different structural models were designed to establish links between the variables studied according to gender.

The route models were shaped from eight observable and one latent variable to define the indicators (Figure 1). The models offer causal explanations of the latent variable from the links observed between the indicators, considering the reliability of the measurements. They likewise include measurement errors over the observable variables in order for these to be directly controlled. The single-direction arrows are lines of influence between the latent and observable variables and these are interpreted as multi-variant regression coefficients.

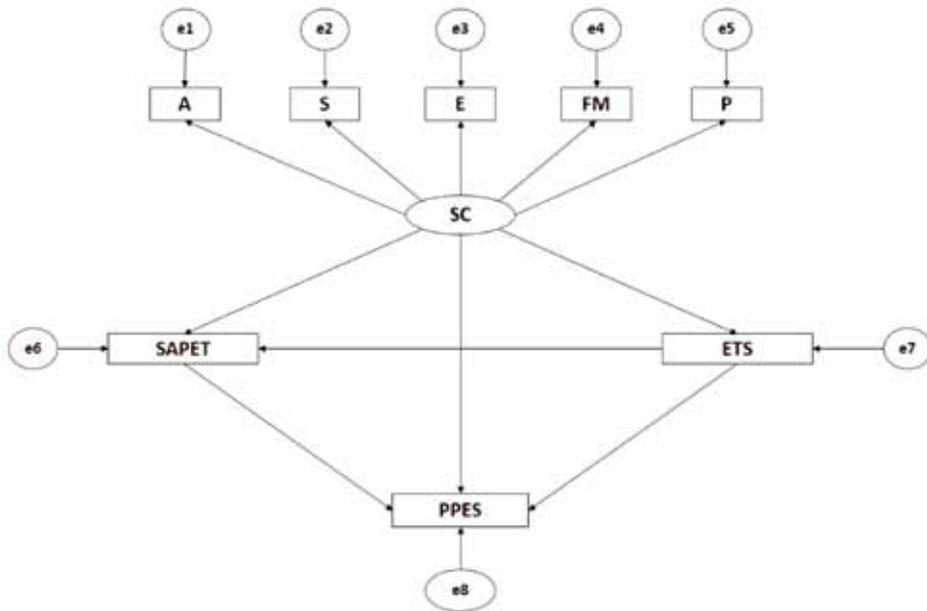


Figure 1. Theoretical Model

Note 1: Self-concept (SC); Academic self-concept (A); Social self-concept (S); Emotional self-concept (E); Family self-concept (FM); Physical self-concept (P); Empathy with Teacher and Subject (ETS); Assessment rating of Subject of Physical education and Teacher (SAPET); Preference for PE as Sport (PPES).

The concept of self (SC) acts as an exogenous variable and can be inferred from five indicators: A (Academic self-concept), S (Social self-concept), E (Emotional self-concept), FM (Family self-concept) and P (Physical self-concept). The Assessment rating of subject and PE teacher (SAPET) acts by way of endogenous variable, influenced by concept of self (SC) and empathy felt toward subject and teacher (ETS).

The fit of the model was tested for compatibility and empirical information obtained. The reliability of the fit was carried out using the Goodness-of-fit criteria of Marsh (2007, p.785). In the case of the Chi-square model fit, the non-significant associated p values indicate a good model fit. The Comparative Fit Index value (CFI) is acceptable with values over .90 and excellent when values surpass .95. The Normalised Fit Index value (NFI) should be over .90. The Increase Fit Index value (IFI) is acceptable at values over .90 and excellent for values over .95. Last, the Root Mean Square Error of Approximation value (RMSEA) is excellent if it is under .05 and acceptable if under .08.

3. RESULTS

The structural equation model proposed in accordance with the type of school analysed reveals a good fit over all the indices of evaluation. The Chi-square offers a significant value for p ($\chi^2 = 322,572$; $DF = 34$; $p < 0.001$). Nevertheless, this index does not allow for interpretation in a standardised manner, plus the additional problem that is posed as a result of its sensitivity to sample size (Marsh, 2007, p.785). Thus, other standardised fit indices are used that are less susceptible to sample size. The Comparative Fit Index (CFI) gives a value of 0.907 that is acceptable. The Normalised Fit Index (NFI) offers a value of 0.901 and the Increase Fit Index (IFI) is 0.907, both of which are acceptable. The Root Mean Square Error of Approximation (RMSEA) gives an acceptable value of .066. In Figure 2 and Table 1, the calculated values of the parameters of the structural model are given for teenagers who study in bilingual schools. Said values must be of an adequate magnitude and their effects significantly different from zero. Likewise there should be no improper values such as negative variances.

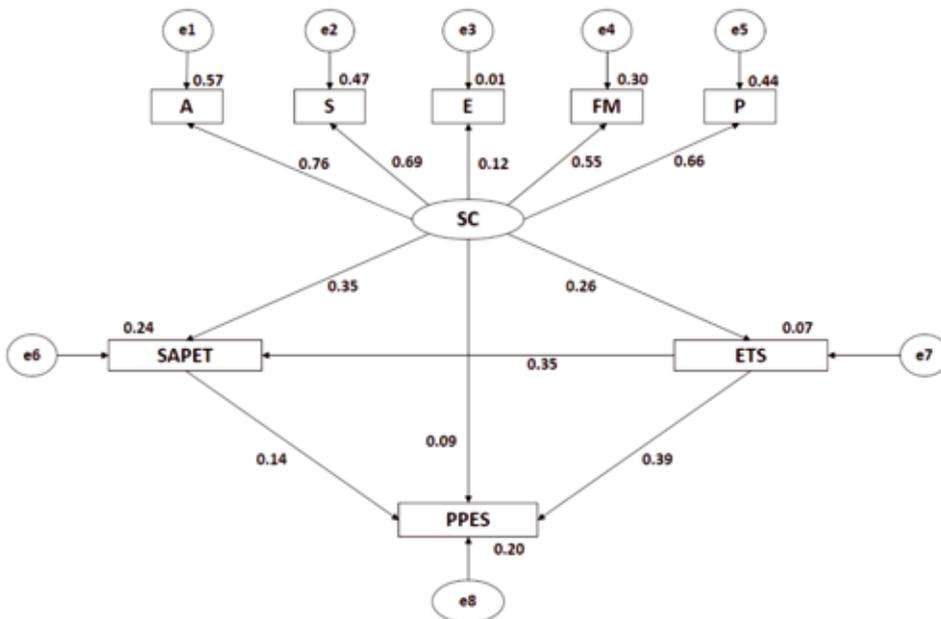


Figure 2. Structural Equation Model for teenagers in bilingual schools

Table 1. Structural Model in teenagers in bilingual schools

Links between variables			P.R.				P.E.R.
			Estimations	S.E.	C.R.	P	Estimations
ETS	←	SC	0.319	0.024	13.205	***	0.264
SAPET	←	SC	0.297	0.015	19.466	***	0.350
SAPET	←	ETS	0.296	0.013	22.463	***	0.351
A	←	SC	1.000	-	-	***	0.758
S	←	SC	0.779	0.027	29.165	***	0.689
E	←	SC	0.145	0.023	6.205	***	0.116
FM	←	SC	0.554	0.022	24.962	***	0.546
P	←	SC	0.804	0.025	32.659	***	0.662
PPES	←	SAPET	0.167	0.022	7.411	***	0.139
PPES	←	ETS	0.392	0.016	24.705	***	0.389
PPES	←	SC	0.111	0.025	4.468	***	0.091

Note1: SC, Self-concept; A, Academic SC; S, Social SC; E, Emotional SC; FM, Family SC; P, Physical SC; SAPET, Subject and PE teacher assessment rating; ETS, Empathy for teacher and subject; PPES, PE and sport preference.

Note2: P.R., Regression weightings; P.E.R., Standardised Regression Weighting; S.E., Standard Error of Estimate; C.R., Critical Ratio.

Note3: *** Link between statistically significant variables at level $p < 0.001$

Statistically significant positive and direct links at level $p < 0.001$ can be observed between concept of self and its component dimensions. When we analyse the weighted influence of the indicators of self-concept, we can see that the academic dimension reveals greatest correlation with SC ($r = 0.758$) followed respectively by the social ($r = 0.689$), physical ($r = 0.662$) and family dimensions ($r = 0.546$) with emotional dimensions exerting least influence ($r = 0.116$).

Likewise, statistically significant positive and direct links are to be seen ($p < 0.001$) between Self Concept and Empathy felt toward Subject and PE teacher ($r = 0.264$). Statistically significant variables at level $p < 0.001$ are also to be noted between Self Concept and Assessment Rating of PE teacher and subject, revealing that there is a direct link ($r = 0.350$) of average correlation strength. Self-Concept and Preference for PE and Sport also give a positive and direct link but with a low correlation strength ($r = 0.091$; $p < 0.001$).

Empathy felt toward subject and PE teacher and Assessment Rating of subject and PE teacher show a direct and positive link ($r = 0.351$; $p < 0.001$) with average correlation strength. Additionally, Empathy felt toward subject and PE teacher links directly and positively to Preference for PE and sport with average correlation strength ($r = 0.389$; $p < 0.001$). Finally, Assessment rating of subject and PE teacher links directly and positively to Preference for PE and sport with a low correlation strength ($r = 0.139$; $p < 0.001$).

The estimated values for the parameters of the structural equation model for students attending non-bilingual schools are shown in Figure 3 and Table 2. These must be of an adequate magnitude and present effects significantly different from zero. Likewise, as before, they should not give any improper estimations such as negative variances.

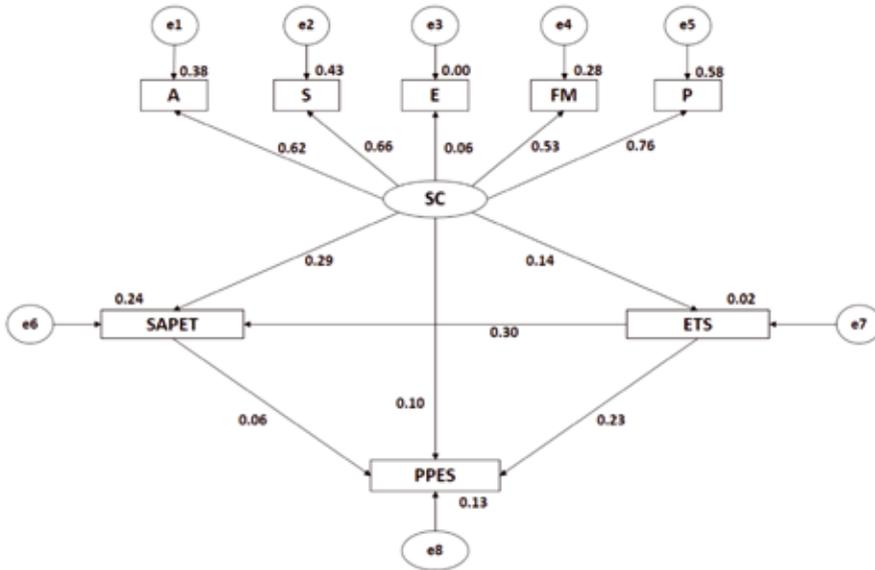


Figure 3. Structural equation model for teenagers attending non-bilingual schools

Table 2. Structural model for teenagers in non-bilingual schools

Links between variables	P.R.					P.E.R.
	Estimations	S.E.	C.R.	P	Estimations	
ETS ← SC	0.138	0.018	7.511	***	0.141	
SAPET ← SC	0.292	0.019	15.000	***	0.286	
SAPET ← ETS	0.262	0.013	20.405	***	0.302	
A ← SC	1.000	-	-	***	0.618	
S ← SC	0.612	0.019	32.532	***	0.658	
E ← SC	0.095	0.028	3.332	***	0.064	
FM ← SC	0.426	0.016	27.116	***	0.526	
P ← SC	1.141	0.038	30.219	***	0.764	
PPES ← SAPET	0.071	0.020	3.486	***	0.061	
PPES ← ETS	0.230	0.018	12.809	***	0.228	
PPES ← SC	0.097	0.019	5.249	***	0.099	

Note 1: SC, Self-concept; A, Academic SC; S, Social SC; E, Emotional SC; FM, Family SC; P, Physical SC; SAPET, Subject and PE teacher assessment rating; ETS, Empathy for teacher and subject; PPES, PE and sport preference.

Note 2: P.R., Regression weightings; P.E.R., Standardised Regression Weighting; S.E., Standard Error of Estimate; C.R., Critical Ratio.

Note 3: *** Link between statistically significant variables at level $p < 0.001$

Statistically significant positive and direct links at level $p < .001$ between all the categories and component dimensions of self-concept. Analysis of the indicators of self-concept allows us to see that the physical dimension shows the strongest correlation coefficient ($r = 0.764$), followed respectively by the social ($r = 0.658$), academic ($r = 0.618$) and family dimensions ($r = 0.526$), with the emotional dimension revealing least influence ($r = 0.061$).

Likewise, significant direct and positive associations are to be observed between Self Concept and Empathy felt toward subject and PE teacher ($p < 0.001$; $r = 0.141$). Statistically significant differences at level $p < 0.001$ are also to be observed between Self-Concept and the Assessment rating of the subject and PE teacher, revealing a direct link with a low correlation strength ($r = 0.286$). Meanwhile Self-Concept and Preference for PE and sport show a direct and positive link with low correlation strength ($r = 0.099$; $p < 0.001$).

Empathy felt toward subject and PE teacher reveals a positive and direct link of average correlation strength with Assessment rating of subject and PE teacher ($r = 0.302$; $p < 0.001$) and Empathy felt toward subject and PE teacher is correlated directly and positively to Preference for PE and sport ($r = 0.228$; $p < 0.001$). Finally, Assessment rating of subject and PE teacher links positively and directly to Preference for PE and sport with a low correlation strength ($r = 0.061$; $p < 0.001$).

4. DISCUSSION AND CONCLUSIONS

The study of bilingualism and its links with self-awareness and PE are concepts that have been studied before, due to the fact that they are central to the context of education in Spain (Cepero-González, García-Pérez & López-López, 2013; Coral & Lleixà, 2013; Salvador-García, Chiva-Bartoll & Isidori, 2017; López-Sánchez, Gris, Sánchez-Mompean, Zauder & Smith, 2018).

With regards to the influence of the various component dimensions of the self-construct on overall self-awareness, it can be seen that where teenager students attend bilingual schools, the academic dimension bears most weighting whereas their peers who attend non-bilingual schools give highest weighting to the physical dimension thereby revealing that the integration of a second language into the teaching-learning process benefits the acquisition of knowledge as found previously in the studies by Sotoca (2014) and López-Sánchez et al. (2018).

It should also be noted that the fact that the physical dimension is more highly valued in non-bilingual schools indicates that, in adolescence, one of the priority elements in the field of socialisation and emotional development is the practice of physical activity (Zurita-Ortega, Castro-Sánchez, Álvaro, Rodríguez & Pérez-Cortés, 2016; Martínez-Martínez, Castro-Sánchez, Rodríguez-Fernández, Zurita-Ortega, Chacón-Cuberos & Espejo-Garcés, 2018).

The data obtained in the study show that although PE forms a normal part of a teenager's education, the fact that the subject is given in a second language in a bilingual school consolidates the academic element and also bears more weighting on the social, family and emotional aspects of the self-concept of these students. These findings confirm the importance of teaching in a second language in favouring social, emotional (Mitchell & Myles, 2004) and family dimensions of self (Hernández-Prados, Gambín & Tolino, 2018).

Following along this same line of argument, there is seen to be a direct and positive link between Self Concept and Empathy felt toward subject and PE teacher with greater correlation strength in teenagers attending bilingual schools than in those who do not, proving that learning in another language creates greater empathy and showing the great potential that bilingual PE teaching can have (Hernández-Garijo et al., 2018).

There is also a stronger link in bilingual schools between teenagers' Empathy toward subject and PE teacher, Assessment rating of subject and PE teacher and Preference for PE and sport along the lines suggested by Cepero-González et al. (2013), which indicate greater ease of producing PE training in another language than is required in other subjects. These findings also connect with the research of Fernández-Barrionuevo (2009), who underlines the importance of instructions toward performing activities for the bilingual PE teacher and thus the direct association between communication of contents and performance. This situation is similar to that posited by Johnson, Erwin, Kipp & Beighle (2017) and Castro-Sánchez et al. (2019) with respect to the importance of PE in teenagers' education, in that it stimulates their levels of motivation; here importance is given to practical application of methodologies that motivate students to reach high levels of English proficiency while promoting their physical, social and cognitive development (Toumpaniari et al., 2015).

We should also mention the benefits of teaching in a second language as confirmed by the data obtained by Baker (2001) and Davies (2009), both of whom indicate that the acquisition of more than two languages develops a meta-linguistic awareness together with creativity, and that studying in bilingual schools favours the acquisition of linguistic competence in other languages.

The analysis of the direct and positive link between concept of self and preference for PE and sport, showing a greater correlation between the two in teenagers attending bilingual schools is important given the incidence of sport in teenagers and how greater interest may incline them toward this activity and away from others as indicated by Castro-Sánchez, Zurita-Ortega, Martínez-Martínez, Chacón-Cuberos & Espejo-Garcés (2016).

It should also be mentioned that there were limitations encountered in this study due to the fact that, although cross-sectional, the data were restricted to one specific moment in time. Another limitation was that the results could not be extended toward the rest of the teenage population in Spain but rather are restricted to a local analysis of teenagers in Andalusia. We should further indicate the possible need to have added to the questionnaire items relating directly to parents to see the degree to which family might influence students.

The main conclusions of this study indicate the influence of the academic aspect of self-concept in teenagers receiving PE in bilingual schools as opposed to the physical aspect weighted more strongly in the case of their peers in non-bilingual educational settings. Likewise, the results of the study establish the existence of a direct and positive link between self-concept and empathy toward subject and PE teacher, together with the value attached to PE as made manifest through the assessment rating of teacher and subject in students who attend bilingual schools. Last but not least, the study concludes that the link between self-concept and preference for PE and sport is stronger in bilingual educational contexts.

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