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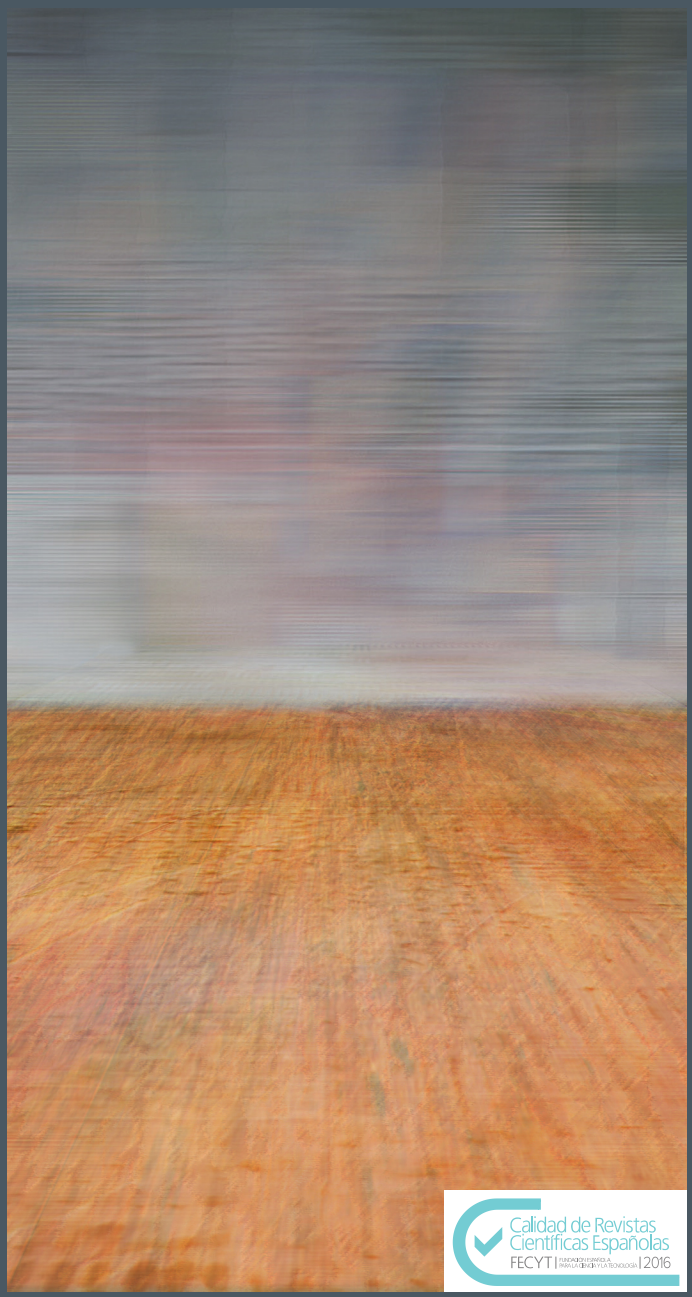

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Presentation

Revista de Educación is a scientific journal published by the Ministerio de Educación, Cultura y Deporte. Founded in 1940, and since 1952 called *Revista de Educación*, it has been a privileged witness of the development of education in the last decades, and an acknowledged means for the dissemination of education research and innovation, both from a national and international perspectives. It is currently assigned to the Instituto Nacional de Evaluación Educativa within the Dirección General de Evaluación y Cooperación Territorial and it is published by the Subdirección General de Documentación y Publicaciones of the Ministerio de Educación, Cultura y Deporte.

Each year we publish four issues. Starting next issue (No. 361), the magazine will have three sections: Research, Essays and Education Experiences, all of them submitted to referees. In the first issue of the year there is also an index of bibliography, and in the second number a report with statistic information about the journal process of this period and the impact factors, as well as a list of our external advisors.

From 2006 to the second number of 2012 (May-August 358), *Revista de Educación* was published in a double format, paper and electronic. The paper edition included all the articles in the especial section, the abstracts of articles pertaining to the rest of sections, and an index of reviewed and received books. The electronic edition contains all articles and reviews of each issue, and it is available through this web page (www.mecd.gob.es/revista-de-educacion/), where it is possible to find more interesting information about the journal. From the 358 number *Revista de Educación* becomes exclusively an online publication.

Revista de Educación assesses, selects and publishes studies framed in well established lines of research, mainly: methodologies of education investigation and assessment; analysis of education systems and public policies; evolution and history of contemporary education systems; education reforms and innovations; quality and equity in education; curriculum; didactics; school organization and management; attention to diversity and inclusive education; educational guidance and tutorship; teacher selection, training and professional development; international cooperation for the development of education.

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***Revista de Educación* does not necessarily agree with opinions and judgements maintained by authors**

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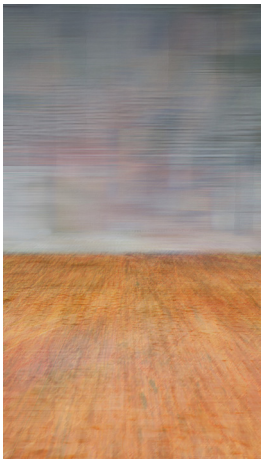
Research



Research

Students and screens: a good or a bad friendship? A longitudinal case study for Spain[1]

Los estudiantes y las pantallas: ¿una buena o mala relación? Un estudio longitudinal para España

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Abstract

TV and video games have been popularly considered as harmful for students' academic performance, to the extent that they are usually related to a sedentary way of living. However, although there is a great amount of empirical research on this issue, most of the evidence is based on purely correlational analyses. The current research intends to go further from correlational studies and analyse the influence that the time students devote to watch TV and play video games has on different measures of academic progression from primary to secondary education; specifically, students' scores and their likelihood of grade retention. Departing from rich census and longitudinal data for the region of Andalusia (in Spain) we have applied a time fixed-effects analysis. Opposite to common intuition, we find that the time students spend watching TV has a positive but decreasing influence on students' academic achievement, and playing video games also presents a positive influence on mathematics until a certain threshold (1 hour), becoming negative for students' academic performance when they

(1) Acknowledgements: The data used in this research has been provided by *Agencia Andaluza de Evaluación Educativa, Consejería de Educación, Junta de Andalucía*. This work has been partly supported by the *Ministerio de Economía, Industria y Competitividad* under Research Project ECO2017-88883-R; the *Fundación Centro de Estudios Andaluces* (under Research Project PRY085/19) and the postdoctoral contract from the *Plan Propio* signed by the *Universidad de Málaga*.

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spend too much time. However, students' likelihood of grade retention does not seem to be influenced by the time spent on TV and video games.

Keywords: TV; video games; academic achievement; students' academic progression; time fixed-effects Andalusia.

Resumen

Los videojuegos y la televisión son popularmente conocidos como nocivos para el rendimiento académico de los estudiantes, en la medida en que suelen estar relacionados con formas de vida sedentarias. Sin embargo, aunque hay una gran cantidad de investigación empírica sobre este tema, la mayoría de la evidencia está basada en análisis puramente correlacionales. Esta investigación pretende ir más lejos que los estudios correlacionales y analizar la influencia del tiempo que los estudiantes emplean en ver la televisión y jugar a videojuegos sobre diferentes medidas de progresión académica desde educación primaria a secundaria, centrándose específicamente en el rendimiento académico de los estudiantes y su probabilidad de repetición. Se ha aplicado un análisis de efectos fijos temporales sobre los datos censales y longitudinales disponibles para la región de Andalucía (España). Al contrario de lo que podría esperarse, encontramos que el tiempo que los estudiantes emplean en ver la televisión tiene una influencia positiva pero decreciente sobre su rendimiento académico, y que jugar a videojuegos también presenta una influencia positiva en matemáticas hasta un cierto umbral (1 hora), volviéndose negativa para el rendimiento académico de los estudiantes cuando emplean mucho tiempo. Sin embargo, la probabilidad de repetición de los estudiantes no parece verse influenciada por el tiempo empleado frente a la televisión y en los videojuegos.

Palabras clave: televisión; videojuegos; rendimiento académico; progresión académica de los estudiantes; efectos fijos temporales; Andalucía.

Introduction

Screens are occupying most of our spare time through some sedentary activities we can do as, e.g., watching TV, using the mobile phone, playing video games, etc. This lifestyle not only potentially relates to population's health and ways of living in a negative manner (Vandewater, Shim, & Caplovitz, 2004; Sisson et al., 2009), but also worsen its performance when studying or working (Esteban-Cornejo et al., 2015; Rhodes, Mark,

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& Temmel, 2012). Furthermore, these activities are likely to become some kind of addiction (Kubey & Csikszentmihalyi, 2002, for the case of TV; or Griffiths & Meredith, 2009, for video games). In this sense, the current research focuses, particularly, on their influence on education, and intends to disentangle to what extent the time that students spend watching TV or playing video games influences their academic progression from primary to secondary education, understanding this progression in terms of academic achievement or likelihood of grade retention.

Specifically, the focus of this research has been placed in the Spanish region of Andalusia, which possesses many characteristics that make its analysis of special interest. First of all, it is the largest populated region in Spain and one of the worst performers in international large-scale assessment tests. Concretely, Andalusia obtained scores which were 19 points below the Spanish average in the reading, mathematics and science competences, and also 19 points below the OECD average in PISA 2015 (MECD, 2016). In addition, Andalusia has very high dropout rates, i.e., students who dropped their studies before completing compulsory education: around 28.9% in 2015, i.e. 4.9% higher than the Spanish dropout rate (IECA, 2020). Andalusia also presents one of the highest repetition rates of Spanish regions in PISA 2015 (38% of students had repeated before reaching 15-16 years, which overcomes by 7% the Spanish repetition rate and 26% that of the OECD; MECD, 2016).

In this context, the novelty of this research, for the Spanish case, is twofold: first, it departs from longitudinal and census data which, to the best of our knowledge, is the first time that have been used to study the influence of TV and video games on students' academic progression from primary to secondary education. These data allow us employing time fixed-effects, an approach which partially solves the potential bias of our results due to endogeneity and/or variable omission, getting results which go further from simple correlation; differentiating in this way from most of the literature on this issue[2]. To the extent that there is a lack of educational longitudinal and census educational data for Spain, this has prevented researchers to study the relationship of TV and video games on students' academic progression for this country

(2) Following Nakamuro, Inui, Senoh, and Hiromatsu (2014), "while much is known about the cross-sectional relationship between TV or video games and children's development, little is known about how children who actually spend more time in front of TV or video games would have developed if they had spent less time doing so." (p. 30).

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going further from a purely correlational way. Second, it is also the first time that the relationship of these variables with students' academic progression has been measured in this way for Spanish students through two different educational outputs, i.e., students' academic achievement and their likelihood of grade retention. Particularly, students' academic achievement presents competences (i.e. "real-life skills"), while grade retention is more related to content-based knowledge (to the extent that students repeat based on an evaluation of this kind of knowledge at school), so that we can obtain results for both kinds of knowledge.

This research is structured as follows: first, a literature review on the association that TV and video games have on students' academic achievement has been performed; then, the data under analysis and the employed methodology for the current analysis are explained. After that, the results of the current research are presented, finishing with some conclusions and policy implications derived from our results.

Literature review

The influence that both TV and video games have on students' performance has been analysed *together* by many researchers, and it seems that results are quite mixed, as we will see in the following. Specifically, authors as Dumais (2008) studied longitudinal data for American students and indicated that students from low socio-economic background were more likely to engage in activities such as watching TV and playing video games, hence, getting lower academic achievement. Other authors as Nakamuro et al. (2014) employed longitudinal data to analyse the association that time devoted to TV and video games has with Japanese children's outcomes as behavioural problems, orientation to school and obesity. They found that, although positive, the association of TV and video game time with these outcomes was so low that it could be considered negligible. There are other authors as Haapala et al. (2014), who analysed the association of sedentary activities as TV watching and playing video games with primary education students' academic achievement in Finland through grades 1 to 3, finding that these particular activities did not influence students' performance and increased boys' arithmetic skills, respectively.

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In the case of papers focused *exclusively on the influence of TV* on students' academic achievement, it seems to be almost a general consensus in the negative association that this activity has with students' performance. In this sense, authors as Shin (2004) analysed longitudinal data on Michigan primary school students, finding that students who watch TV tend to spend less time doing homework, studying or reading for leisure, becoming more impulsive and obtaining lower scores at school. Sharif, Wills, and Sargent (2010) also performed a longitudinal study for primary and secondary education students from the United States and found that TV watching had a negative influence on students' performance through school behaviour problems. Ennemoser and Schneider (2007) also supported this result; they analysed 2 cohort-longitudinal data on kindergarten and primary education students, finding that those students who were classified as "heavy" TV viewers progressed less in reading than "medium" and "light" TV viewers. Going further than this negative association with students' performance, Landhuis, Poulton, Welch, and Hancox (2007) performed a longitudinal research on New Zealand primary education students, finding that TV viewing was positively associated with attention problems in adolescence, being this negative association, then, long-lasting. Furthermore, Turner and Croucher (2013) indicated, for United States students, that TV watching was negative not only for average grade scores but also for students' tendencies to engage in and enjoy effortful thinking.

On the other hand, another strand of the literature bets for a neutral (as previously discussed for Nakamuro et al., 2014, and Haapala et al., 2014) or positive to negative association (when students abuse of TV watching). Razel (2001) performed a meta-analysis on six studies for around 1 million students with an international focus and formulated a complex model on the relationship of TV and academic achievement; they found that a small amount of TV watching was positively associated with students' academic achievement but, when this TV time increased until a certain point, this association became negative.

Focusing on *video game time*, as it happens with TV, most of the video game focused research –general video game research not that focused on educative video games– highlights that the time spent by students on these activities may have a negative association with their academic results. In this subject, Weis and Cerankosky (2010) performed a randomised controlled trial on boys and found that their reading and writing skills

were harmed by this activity. Jackson, von Eye, Witt, Zhao, and Fitzgerald (2011) performed a longitudinal study and found, for 12-year-old American students, that playing video games was associated with higher visual-spatial skills, but also with lower academic achievement; they extended their research for the same-age children to study, additionally to these variables, the influence of video games on Body Mass Index and body weight (Jackson, von Eye, Fitzgerald, Witt, & Zhao, 2011), finding that video games only presented a negative association with the academic achievement of older children and those from low income households. In the case of Asian countries, Yeh and Cheng (2016) found, for 11-14 Taiwanese students, that playing video games was negatively correlated with academic achievement and that parental interventions trying to avoid these practices did not improve students' performance. Other authors as McCoy, Byrne, and Banks (2012) studied longitudinal data on primary school students in Ireland, finding that video games were negatively correlated with engagement, particularly for boys.

Another strand of the video game literature states that academic achievement is not harmed by this video game time, but positively or neutrally influenced. In the case of a positive association, Adachi and Willoughby (2013) found that Canadian students were benefited by certain types of video games (role playing and strategy games), which increased students' problem solving skills and academic achievement. Sedeño (2010) also highlighted that video games and their different types can develop certain student skills, so they are relevant for the teaching-learning process. Kovess-Masfety et al. (2016) studied six European countries[3] and found that primary education students were benefited by playing video games in the sense of mental health, intellectual functioning and academic achievement. Young et al. (2012) performed a meta-analysis of more than 300 research papers finding that video games had a positive association with language learning, history and physical education, but little academic value in mathematics and science. Bate, MacNish, and Males (2014) indicated that digital games have an ability to support complex generic lifelong learning competencies, but they have to be supported by politics and schools for their correct implementation, which sometimes does not happen due to their risky characteristics (as competencies are usually assessed in paper and pencil, investment in

(3) Germany, The Netherlands, Lithuania, Romania, Bulgaria and Turkey.

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digital games could be risky). Some interesting research which found a neutral correlation of video games with students' academic achievement, in an international context, is that of Drummond and Sauer (2014), who found for 22 countries participating in PISA 2009 that video games had little association with their academic achievement in reading, mathematics and science.

Although this is not the focus of the present research work, we find it relevant to highlight that, in recent years, students have employed their leisure time in new ways such as e.g. by the use of smartphones (Baert et al., 2019), social networks (Doleck & Lajoie, 2018), watching videos on demand by the Internet (Klobas, McGill, Moghavvemi, & Paramanathan, 2018), reading blogs, listening to podcasts or sending instant messaging (García-Martín & Cantón-Mayo, 2019), among others, which have been found to have an influence on students' academic performance. A wider review of the literature may be needed in this topic, but most of this research seems to point towards a negative influence of the cited leisure time activities when their use is excessive. Thus, these issues are worth exploring and also deserve further attention in future research.

Hence, as it could be appreciated, there is plenty of international and longitudinal research on this issue which provides quite mixed results. Nevertheless, to the best of our knowledge, this is the first time that longitudinal census educational data has been employed to analyse the relationship of TV watching and playing video games with Spanish students' academic progression, overcoming correlational studies for this country and, hence, filling the gap in the literature. This is mainly because both census and longitudinal educational data are a rarity for Spain.

Data

In this research census and longitudinal data provided by the *Agencia Andaluza de Evaluación Educativa* (AGAEVE) have been employed. Particularly, this dataset was obtained from the Diagnostic Assessment (*Evaluación de Diagnóstico*, DA, from now on[4]) for the whole population

[4] This DA was regulated in the education law which was applicable for the courses under analysis *(Ley Orgánica 2/2006, de 3 de mayo, de Educación* – LOE; BOE, 2006, art. 21, for the conduction of

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of Andalusian students in a particular course, which was conducted on an annual basis. The objective of this assessment was to improve the knowledge of students and their learning in the Andalusian education system; in order to achieve this aim students' basic curricular competences were evaluated. In particular, these competences were assessed by the use of validated cognitive tests, which were designed to be similar to those provided by PISA. Furthermore, students answered a contextual questionnaire which gathered information about their socio-economic characteristics (sex, age, parents' level of education, etc.). In addition, head teachers answered a school questionnaire asking about the characteristics of their school (number of students enrolled, school funding, availability of school library, etc.).

This research is focused on the 2008-09, 2011-12 and 2012-13 DA waves. Concretely, we analysed those students who were in the 5th grade of primary education (5th grade) in the course 2008-09 and followed them in the course 2011-12, when they were in the 2nd grade of secondary education (8th grade). The 8th grade 2012-13 data were used to follow those students who repeated between the courses 2008-09 and 2011-12, so they will appear in the course 2012-13[5,6]. We employ the data for the academic year 2011-12 because it is the last cycle of this census data in which we can follow students from 5th grade (2008-09) to 8th grade (2011-12). From the departing figure of 78,413 5th grade Andalusian students in 2008-09, a total of 70,131 of them can be followed in 8th grade, who are the focus of the current analysis; a figure which is reduced due to missing information in the relevant variables under study. Nevertheless, our main estimations have been replicated using a missing flag procedure for the main variables of our research to avoid losing observations and our main results are kept, showing that missing information was randomly lost and, hence, not having it would not bias our results. Hence, we end up working with a large sample.

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these DA in primary education; art. 29, for secondary education and art. 144 for the competences that Administrations have in this DA).

(5) Repeater students were identified, firstly, by following the applicable Spanish education law for the previous courses to 2008/09 – *Ley Orgánica 10/2002, de 23 de diciembre, de Calidad de la Educación,* i.e., LOCE (BOE, 2002), from 2002 to 2006. According to this law, students can only repeat once in primary education (BOE, 2002, art. 17.3). The following education law, *Ley Orgánica 2/2006, de 3 de mayo, de Educación,* i.e., LOE (BOE, 2006) also highlighted this (BOE, 2006, art. 20.2) and lasted from 2006 to 2013.

(6) We cannot follow from previous grades these students who were in 8th grade in 2012/13, so they cannot be the focus of our research work.

The current research focuses on the competences of linguistic communication in Spanish language[7] ("reading", from now on) and mathematics reasoning[8] ("mathematics", from now on). Students' scores in these competences have been standardised[9] to have mean 0 and standard deviation 1, so that we can interpret our results as effect sizes.

The information contained in this dataset also included contextual questionnaires about students, families, schools and teachers. Particularly, the 5th and 8th grade student questionnaires contained the following questions, which are the focus of our analysis:

"Approximately, how much time do you spend, out of school, doing these activities":

a) "Watching TV (videos, DVD)".

b) "Playing video games or computer games".

Students could answer to each one of these two activities one of the following options: "no time", "until 1 hour", "1 to 3 hours", "3 to 5 hours" or "5 hours or more".

The descriptive statistics for these TV and video game variables in 5th grade, together with other contextual background variables, are presented in Table AI (Appendix). Focusing on the TV and video game variables, it can be appreciated that most students spend until 1 hour doing these activities daily. Looking at the statistics presented in Table AII (Appendix), when analysing gender differences in the time devoted by students to watching TV and playing video games, it can be observed that boys devote more time to these activities than girls. In the case of the socio-economic status index tertiles (created using the socio-economic index distribution, which is an index provided by AGAEVE[10]) students

(7) This competence is defined as "the use of language as an instrument of oral and written communication, of presentation, interpretation and comprehension of reality; to construct and communicate the knowledge, to organize and to auto-regulate thinking, emotions and behaviour" (AGAEVE, 2009, p. 7).

(8) This competence is defined as "the ability to use and relate numbers, their basic operations, symbols and expression forms and mathematic reasoning, to produce and interpret different types of information and to increase knowledge on quantitative and spatial aspects of reality and to solve problems related to daily life and to the labour world" (AGAEVE, 2009, p. 7).

(9) With the objective of interpreting the results' section, we provide here the mean and standard deviation of the population used to standardise students' scores in each subject and course: in 2008-09 the mean score in reading (mathematics in brackets) was 68.14 (48.92) with a standard deviation of 17.21 (12.74); in 2011-12, the mean score in reading was 78.92 (39.75) with a standard deviation of 18.38 (11.50); in 2012-13, the mean score in reading was 70.24 (40.78) with a standard deviation of 18.44 (11.92).

(10) AGAEVE defined this variable to have mean 0 and standard deviation 1. In order to create it, the highest level of education of the parents, the highest parental occupation, the number of books at

present an increasing amount of TV watching and video game playing time while decreasing through the socio-economic index tertiles (as indicated by authors as Dumais, 2008).

Methodology

Study design

Before describing the methodology employed for the present research work, we first enunciate the questions that we intend to answer:

1) Does the time students devote to watch TV (videos, DVD) and to play video games or computer games influence their academic performance in reading and mathematics?

2) Does the time students devote to watch TV (videos, DVD) and play video games or computer games influence their likelihood of repeating a grade?

As we will see in the following, our methodological approach will let us answer these questions getting as close as possible to a causal way but, however, we are cautious and interpret our results as correlations rather than as causal relationships.

Methodological approach

This research relies on an identification strategy based on the use of time fixed-effects to get the association of TV and video games with students' academic progression (measured, alternatively, by students' academic achievement and grade repetition) between primary and secondary education. This method lets to account for those characteristics which are the same within-students between-years –for example sex– and obtain the influence of TV and video games on students' academic progression from primary to secondary education. However, we find necessary to acknowledge that controlling for all unobservables is a really difficult, if not almost impossible, task. In this sense, our estimates may still have

home and the level of home resources were used.

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some issues on (a) the omission of relevant variables (those which vary between years and are not controlled in our model); (b) the self-reported nature of TV and video game time, which can introduce measurement error in our model (which is partly solved by using two points in time); and (c) TV and video game time are not randomly assigned, but chosen by students based on their preferences (which is partly solved as we control for those preferences which do not vary between-years). Because of these reasons, we will not interpret our estimates as causal effects, but as conditional associations. This means that our analysis intends to study whether TV and video game time is associated with students' academic progression from primary to secondary education in terms of academic achievement and likelihood of grade retention.

We depart from the definition of an education production function (for panel data) to explain the influence of watching TV and playing video games on students' academic achievement:

$$Y_{ijt} = \alpha + \beta TV_{ijt} + \gamma X_{ijt} + \delta SC_{jt} + \varepsilon_{ijt} \quad (1)$$
$$Y_{ijt} = \alpha + \delta VG_{ijt} + \gamma X_{ijt} + \delta SC_{jt} + \varepsilon_{ijt} \quad (2)$$

where i is the student, j the school and t the grade ($t = 0$ in 5th grade and $t = 1$ in 8th grade); Y_{ijt} are students' scores in reading or mathematics; TV_{ijt} is the time that students spend watching *TV;* VG_{ijt} is the time that students spend playing video games; X_{ijt} are those student observable characteristics which are the same between-years; SC_{jt} are school characteristics which are the same between-years; ε_{ijt} is the idiosyncratic error term.

We obtain our base models when estimating these education production functions by the use of time fixed-effects. If we define for 5th grade data and for 8th grade data, eliminating the sub-indexes of equations (1) and (2) and applying differences between years, our base models are defined, respectively, as:

$$Y_{ij\,t_1} - Y_{ij\,t_0} = \Delta Y = \beta \Delta TV + \gamma \Delta X + \delta \Delta SC + \Delta \varepsilon \quad (3)$$
$$Y_{ij\,t_1} - Y_{ij\,t_0} = \Delta Y = \delta \Delta VG + \gamma \Delta X + \delta \Delta SC + \Delta \varepsilon \quad (4)$$

As and characteristics are the same between-years, their differences are zero, letting us obtain the influence of TV (β) and video games (δ) on students' academic progression. In addition, school dummy variables have been included in models (3) and (4) in order to account for the variation

in students' academic achievement due to students changing school – around 75% of students changed school between primary and secondary education, because most primary education schools in Andalusia do not offer both primary and secondary education. Furthermore, a year dummy control has been added to both models (3) and (4) to capture the variation in students' academic achievement between years which is not the result of TV or video game time (alternatively) as, e.g., the change in subject difficulty between the two grades. In addition, a control for socio-economic status of students has been included through the use of the socio-economic status index. The objective of using this index is to account for any variation between years in students' background characteristics which can bias the obtained results on TV and video games – as these activities may depend on the availability of these resources at home and, hence, socio-economic status. All these additional controls intend to gather potential confounding variables which can potentially bias our β and δ conditional association coefficients.

This identification strategy builds upon an important requirement of the variables under analysis: particularly, we need that TV and video game variables present enough variability between both grades. The fact that we are exploring a period of time which supposes the transition between primary and secondary education could, in some way, assure us a certain variation in these variables, as students may have to change the distribution of their out-of-school time use due, e.g., to the increasing time devoted to homework tasks when reaching secondary education. In relation to this, our data indicates that around 66% of students changed their time watching TV between 5th and 8th grade and 68% in the case of playing video games, what assures enough variability to support our results. One additional requirement is that TV and video game time variables have to be measured before they influence students' academic progression, what lets to avoid temporal asymmetry between the dependent and independent variables (Trusty, Plata, & Salazar, 2003). Our data accomplishes this point, as students are tested after they have performed the daily TV and video game activities they report.

While students' academic achievement measures competences (i.e. "real-life skills"), grade retention is more related to content-based knowledge (as students repeat based on an evaluation of this kind of knowledge at school). Hence, as previously indicated, students' academic progression from primary to secondary education has been also measured by their

likelihood of grade repetition. Concretely, the variation between 5th and 8th grade of students' time watching TV and playing video games is exploited to analyse the likelihood of grade retention of those students who did not repeat between the courses 2008-09 and 2011-12. In this sense, in the course 2011-12 these students could pass or fail and repeat the course, meaning this that, in the latter case, they have repeated 8th grade in the course 2012-13. Departing from models (3) and (4), this analysis is performed by defining a binary dependent variable, whose value is "0" in (5th grade in 2008/09) – because these students did not repeat between 2008-09 and 2011-12 – and, in (9th/8th grade in 2012/13), this variable takes the value "1" if the student failed 8th grade in 2011-12 and repeated in 2012-13 or the value "0" if the student passed to 9th grade when completing 8th grade in 2011-12[11]. Hence, ΔY in models (3) and (4) is substituted by this repetition variable (ΔR). This model has been estimated by the use of a linear probability model with time fixed-effects[12].

Results

Does the time students devote to watch TV (videos, DVD) and to play video games or computer games influence their academic performance in reading and mathematics?

In the following, we analyse the association of TV and video games with students' academic progression using the models proposed in the previous section. The results of the analysis of the relationship of these activities with our first measurement of students' academic progression, i.e., students' academic achievement, are presented in Table I.a for watching TV and Table

(11) The potential reverse causality of TV and video game variables for this grade retention model has been avoided by: (a) the definition of the TV and video game variables, which have been used in 5th grade to explain grade retention in (2008/09), while these variables in 8th grade are used to explain it in (2012/13); and (b) by the sample employed – those students who did not repeat between 2008-09 and 2011-12.

(12) A logistic regression with time fixed-effects may seem to be the best option to estimate this model, due to the binary nature of the dependent variable. However, defining such a model means dropping all those observations in which the grade retention variable does not vary between years – i.e., the observations corresponding to those students who did not repeat in and . Although linear probability models are criticised due to heteroscedasticity and the prediction of probabilities which are not between 0 and 1, the first problem has been solved by the use of robust standard errors, while the second problem is not so for us, as we are not interested in predictions.

I.b for playing video games. Two different specifications have been defined for each one of the two variables: specification I, in which the corresponding variable is presented in its original categorical form and specification II, in which it has been translated into a quasi-continuous variable[13], including it in a quadratic form to capture potential non-linearities. Furthermore, each one of our time-fixed effects estimations (FE) has been replicated using ordinary least squares (OLS).Our main results for TV watching (Table I.a) show that this practice seems to positively associate with students' academic achievement when little time is devoted to it; specifically watching TV less than 1 hour positively correlates with students' academic achievement between 0.074 and 0.064 standard deviations (SD), for reading and mathematics, respectively, which is a significant and moderately high association. However, this positive association is reduced while the time students spend watching TV increases (especially for mathematics). This finding is in accordance to what Nakamuro et al. (2014) found and, to some extent, Razel (2001) – as previously argued –, presenting TV watching a positive association always that it does not become an addiction (Kubey & Csikszentmihalyi, 2002). Nevertheless, it does not seem to have a negative association with students' academic achievement in any number of hours.

In the case of the time students spend playing video games (Table I.b) it seems that it does not associate with students' academic achievement in reading until more than 3 hours, presenting then a negative association of 0.028 SD with students' academic achievement until reaching a negative correlation of 0.058 SD for 5 hours or more; for mathematics, until 1 hour positively associates with students' academic performance in 0.026 SD (as highlighted by Haapala et al., 2014, who indicated that it increases students' arithmetic skills), having a non-significant association until 5 hours or more, in which it negatively associates with students' academic achievement in 0.052 SD. Hence, it seems that playing video games could have benefits for students' skills (Sedeño, 2010) when it does not become an addiction (Griffiths & Meredith, 2009).

This shows that the time devoted to these activities presents a positive/null but decreasing association with students' academic achievement when increasing the time devoted to them; an association which is always positive in the case of TV watching, but becomes null and even negative in

(13) The values in hours which have been assigned to create this quasi-continuous variable have been the class marks for each one of the categories in TV and video game variables: 0 hours for "no time", 0.5 hours for "until 1 hour", 2 hours for "1 to 3 hours", 4 hours for "3 to 5 hours" and 6 hours for "5 hours or more".

the case of playing video games, something which is corroborated when checking our results for the quasi-continuous form of these variables and its quadratic term.

A graphic summary of these main results with time-fixed effects for Tables I.a and I.b (Specification I) is presented in Figure AI (Appendix).

When these models are estimated by the use of OLS we can see a similar trend in the association of TV and video game time, but the quantity of the association is higher, most likely due to the biasing influence of omitted time-invariant variables, which are controlled by when using time fixed-effects[14]. Hence, our TV and video game variables would be gathering the association of these omitted variables and, hence, their coefficients increase.

Does the time students devote to watch TV (videos, DVD) and play video games or computer games influence their likelihood of repeating a grade?

In the case of the alternative way of measurement of students' academic progression, i.e., students' grade retention, the results of this analysis are presented in Table II for watching TV (specifications I and II) and for video games (specifications III and IV). Particularly, the likelihood of grade retention is positively associated for both TV and video games only for the category of between 3 to 5 hours, in 2.1% and 1.6%, respectively. These probabilities may seem too low, but we have to bear in mind that the sample is that of students who did not repeat between 5th grade in 2008-09 and 8th grade in 2011-12, as previously explained in the Methodology section. Hence, we could say that, for students who have progressed without repeating a grade in the important final grade transition between primary and secondary education, TV watching and playing video games do not seem to increase their likelihood of failing and repeating in the first half of secondary education. A graphic summary of these main results with time-fixed effects for Table II (Specifications I and III) is presented in Figure AII (Appendix).

(14) The estimations in Tables I.a and I.b were performed using the DA data of the 2011-12 course for those students who were in 8th grade in the course 2011-12 but failed and repeated that grade in 2012-13. These estimations have been replicated using the information of these students in the course 2012-13 and results hold. The results of these estimations are presented in Tables AIII.a and AIII.b – Appendix.

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TABLE I.a. The association of time devoted to watch TV (videos, DVD) with students' academic achievement

	Specification I				Specification II			
	Reading		Mathematics		Reading		Mathematics	
Variables	OLS	FE	OLS	FE	OLS	FE	OLS	FE
Time devoted to watch TV (videos, DVD) each day (Ref.: no time)								
5 hours or more	0.012	0.052***	0.095***	0.001	-	-	-	-
	(0.018)	(0.019)	(0.018)	(0.019)				
3 to 5 hours	0.233***	0.082***	0.291***	0.035**	-	-	-	-
	(0.015)	(0.015)	(0.015)	(0.015)				
1 to 3 hours	0.259***	0.099***	0.312***	0.051***	-	-	-	-
	(0.013)	(0.014)	(0.013)	(0.013)				
Until 1 hour	0.150***	0.074***	0.166***	0.064***	-	-	-	-
	(0.013)	(0.013)	(0.013)	(0.013)				
Time devoted to watch TV (videos, DVD) each day (quasi-continuous variable in hours)	-	-	-	-	0.152***	0.038***	0.179***	0.007
					(0.006)	(0.006)	(0.006)	(0.006)
Squared time devoted to watch TV (videos, DVD) each day (quasi-continuous variable in hours)	-	-	-	-	-0.027***	-0.006***	-0.030***	-0.003**
					(0.001)	(0.001)	(0.001)	(0.001)
Socio-economic status index	0.282***	0.036***	0.303***	0.042***	0.283***	0.037***	0.303***	0.042***
	(0.004)	(0.007)	(0.004)	(0.007)	(0.004)	(0.007)	(0.004)	(0.007)
8th Grade (Ref.: 5th Grade)	0.129***	0.166***	0.178***	0.234***	0.129***	0.167***	0.179***	0.234***
	(0.010)	(0.008)	(0.011)	(0.009)	(0.010)	(0.008)	(0.011)	(0.009)
School dummies	✓	✓	✓	✓	✓	✓	✓	✓
Constant	-0.462***	-1.357***	-0.936***	-1.009***	-0.394**	-1.305***	-0.862***	-0.956***
	(0.160)	(0.241)	(0.144)	(0.258)	(0.159)	(0.241)	(0.144)	(0.258)
Observations	76,450	76,450	76,594	76,594	76,450	76,450	76,594	76,594

Notes: Standard errors are in parentheses and robust. The thick (✓) means that a dummy for each school has been included.
Estimation method: Ordinary Least Squares (OLS) and Time Fixed-Effects (FE).
Dependent variable: Standardised scores using the mean and standard deviations of the total population for that particular DA cycle.
Coefficient: ***Significant at 1%, ** significant at 5%, * significant at 10%.
Source: Authors' own calculations.

TABLE I.b. The association of time devoted to play video games or computer games with students' academic achievement

	Specification I				Specification II			
	Reading		Mathematics		Reading		Mathematics	
Variables	OLS	FE	OLS	FE	OLS	FE	OLS	FE
Time devoted to play video games or computer games each day (Ref.: no time)								
5 hours or more	-0.394***	-0.058***	-0.226***	-0.052***	-	-	-	-
	(0.013)	(0.015)	(0.013)	(0.015)				
3 to 5 hours	-0.132***	-0.028**	0.022*	-0.013	-	-	-	-
	(0.012)	(0.013)	(0.012)	(0.012)				
1 to 3 hours	-0.034***	0.007	0.121***	0.015	-	-	-	-
	(0.009)	(0.010)	(0.009)	(0.010)				
Until 1 hour	-0.026***	0.013	0.069***	0.026***	-	-	-	-
	(0.008)	(0.009)	(0.008)	(0.009)				
Time devoted to play video games or computer games each day (quasi-continuous variable in hours)	-	-	-	-	0.022***	0.004	0.099***	0.008
					(0.006)	(0.006)	(0.006)	(0.006)
Squared time devoted to play video games or computer games each day (quasi-continuous variable in hours)	-	-	-	-	-0.014***	-0.003**	-0.023***	-0.003***
					(0.001)	(0.001)	(0.001)	(0.001)
Socio-economic status index	0.275***	0.034***	0.297***	0.039***	0.275***	0.034***	0.297***	0.039***
	(0.004)	(0.007)	(0.004)	(0.007)	(0.004)	(0.007)	(0.004)	(0.007)
8th Grade (Ref.: 5th Grade)	0.163***	0.176***	0.219***	0.241***	0.166***	0.175***	0.216***	0.239***
	(0.010)	(0.008)	(0.011)	(0.009)	(0.010)	(0.008)	(0.011)	(0.008)
School dummies	✓	✓	✓	✓	✓	✓	✓	✓
Constant	-0.186	-0.286	-0.618***	0.970***	-0.211	-0.288	-0.600***	0.975***
	(0.170)	(0.303)	(0.188)	(0.258)	(0.170)	(0.304)	(0.188)	(0.258)
Observations	76,616	76,616	76,748	76,748	76,616	76,616	76,748	76,748

Notes: Standard errors are in parentheses and robust. The thick (✓) means that a dummy for each school has been included.
Estimation method: Ordinary Least Squares (OLS) and Time Fixed-Effects (FE).
Dependent variable: Standardised scores using the mean and standard deviations of the total population for that particular DA cycle.
Coefficient: ***Significant at 1%, ** significant at 5%, * significant at 10%.
Source: Authors' own calculations.

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TABLE II. The association of time devoted to watch TV (videos, DVD) and play video games or computer games with grade repetition

	Watch TV (videos, DVD)		**Play video games or computer games**	
Variables	Spec. I	Spec. II	Spec. III	Spec. IV
Time devoted to [watch TV (videos, DVD)/ play video games or computer games] each day (Ref.: no time)				
5 hours or more	0.014*	-	0.006	-
	(0.007)		(0.006)	
3 to 5 hours	0.021***	-	0.016***	-
	(0.006)		(0.005)	
1 to 3 hours	0.009*	-	0.006*	-
	(0.005)		(0.003)	
Until 1 hour	0.006	-	0.011***	-
	(0.005)		(0.003)	
Time devoted to [watch TV (videos, DVD)/ play video games or computer games] each day (quasi-continuous variable in hours)	-	0.005**	-	0.004*
		(0.002)		(0.002)
Squared time devoted to [watch TV (videos, DVD)/ play video games or computer games] each day (quasi-continuous variable in hours)	-	-0.000	-	-0.001
		(0.000)		(0.000)
Socio-economic status index	-0.012***	-0.012***	-0.011***	-0.011***
	(0.003)	(0.003)	(0.003)	(0.003)
8th Grade (Ref.: 5th Grade)	0.046***	0.046***	0.047***	0.046***
	(0.002)	(0.002)	(0.002)	(0.002)
School dummies	✓	✓	✓	✓
Constant	-0.035	-0.034	0.287	0.295
	(0.102)	(0.102)	(0.258)	(0.259)
Observations	71,568	71,568	71,712	71,712

Notes: Standard errors are in parentheses and robust. The sample is that of students who did not repeat between 2008-09 and 2011-12. The thick (✓) means that a dummy for each school has been included. "Spec." stands for "Specification".

Estimation method: Time Fixed-Effects.

Dependent variable: Binary variable with value "0" in 5th grade and, in 8th grade, with value "1" if the student failed 8th grade in 2011-12 and repeated that grade in 2012-13 and "0" if he/she passed to 9th grade when finishing 8th grade in 2011/12.

Coefficient: ***Significant at 1%, ** significant at 5%, * significant at 10%.

Source: Authors' own calculations.

Discussion and conclusions

The current research has focused on analysing the influence that watching TV and playing video games could have on Andalusian students' academic progression from primary to secondary education, particularly measured by students' academic achievement and their likelihood of grade retention. In order to approach this issue, rich longitudinal and census educational data has been employed, by the use of time fixed-effects. This research hence adds to the existing literature the analysis of this issue for Spain, focusing on two different educational outputs and going further from purely correlational studies. Our main results show that TV time may have a positive influence on students' academic performance, being reduced (but still positive) when students devote more time to TV, while video games may have a positive association with mathematics performance when students devote a moderate amount of time to them, but a negative one – in both subjects – when this activity takes a lot of their daytime. In the case of the association of these activities with the likelihood of grade retention between primary and secondary education, it seems that devoting time to these activities has a close to null association with it; nevertheless, we have to bear in mind that these results are applicable only for non-repeater students between 5th and 8th grade.

These results could be showing that, to the extent that video games are used by students as a way of "distraction" from school or as a "hobby", i.e. activities in which they devote a few hours of their daily free time after school, they are not harmful for their academic progression. Nevertheless, when playing video games becomes an "addiction" more than a hobby, students may see their performance reduced. In the case of TV watching, it seems that it is not very harmful for students, but an excessive amount of it would not report students a very high benefit, as they could devote their time to other – maybe – more productive activities.

Building on these results, we find that students may be benefited from devoting a moderate amount of time to these activities, so policies related to controlling the time that students spend on these activities could be advisable. In this sense, informing parents at school on this issue is of vital importance, to the extent that they can regulate the time that their children spend on these activities. Furthermore, students should also be advised on this subject, as they should get enough autonomy

to efficiently organise their time. We have also to highlight a relevant point on this research: the dependent variable used to measure student academic achievement which is, alternatively, students' reading and mathematics achievement. This variable measures students' competences (that is, "real life" skills), while grade retention would be more related to students' not reaching a certain level of content-based knowledge in the subjects they are being taught. Hence, besides some limitations, our results would show the association of TV and video game time with both types of knowledge (competence and content-based). This may indicate that students' competences are those which are actually more harmed by an excessive amount of time of these activities; this is relevant, insofar as these competencies are of vital importance in modern society (OECD, 2010) and for labour market success (Quintini, 2014).

To conclude, the current research presents some limitations. First, although we employed time fixed-effects and controlled by many factors which can condition the relationship between students' academic progression and TV and video game time, there are many other factors which are not gathered by our data (e.g., changes in students' use of time in other activities) and might be omitted variables in our analysis. Second, students present missing information in some of the relevant variables of our analysis; although this could be an issue, replicating our research using missing flag variables have given similar results, so this missing data may not be problematic. Third, TV and video game time are self-reported, so they are subject to measurement error; although we can solve in a certain way this issue, as we have two different points in time, it is still a concern. Fourth, as students' time on TV and video games are not randomly assigned, but decided by students, these variables are somewhat correlated with variables as e.g. students' preferences. This is an issue which we partly solve when using time fixed-effects, as we control for those preferences which do not vary between-years. In future research it could be useful to have information on the kind of TV programmes or video games that students watch/play, in order to discern whether our results can be extended to all types of these activities or only to particular ones. Fifth, there are many other leisure activities which students devote their time on and have been found in recent literature to have a positive association with students' academic performance, such as music training (Swaminathan & Schellenberg, 2019), physical activity (Singh et al., 2019) or playing games as e.g. chess

(Poston & Vandenkieboom, 2019). Unfortunately, our database does not contain information on these activities, but their analysis on future research may shed further light into the study of the relationship between students' leisure time activities and their academic performance. Sixth, in recent years, students have employed their leisure time on new activities such as using their smartphones (Baert et al., 2019), social networks (Doleck & Lajoie, 2018), watching videos on demand by the Internet (Klobas et al., 2018), reading blogs, listening to podcasts or sending instant messaging (García-Martín & Cantón-Mayo, 2019), among others, which have been found to have an influence on students' academic performance. Lamentably, our dataset does not contain information on these practices, so the analysis of this issue could be of special relevance for future research.

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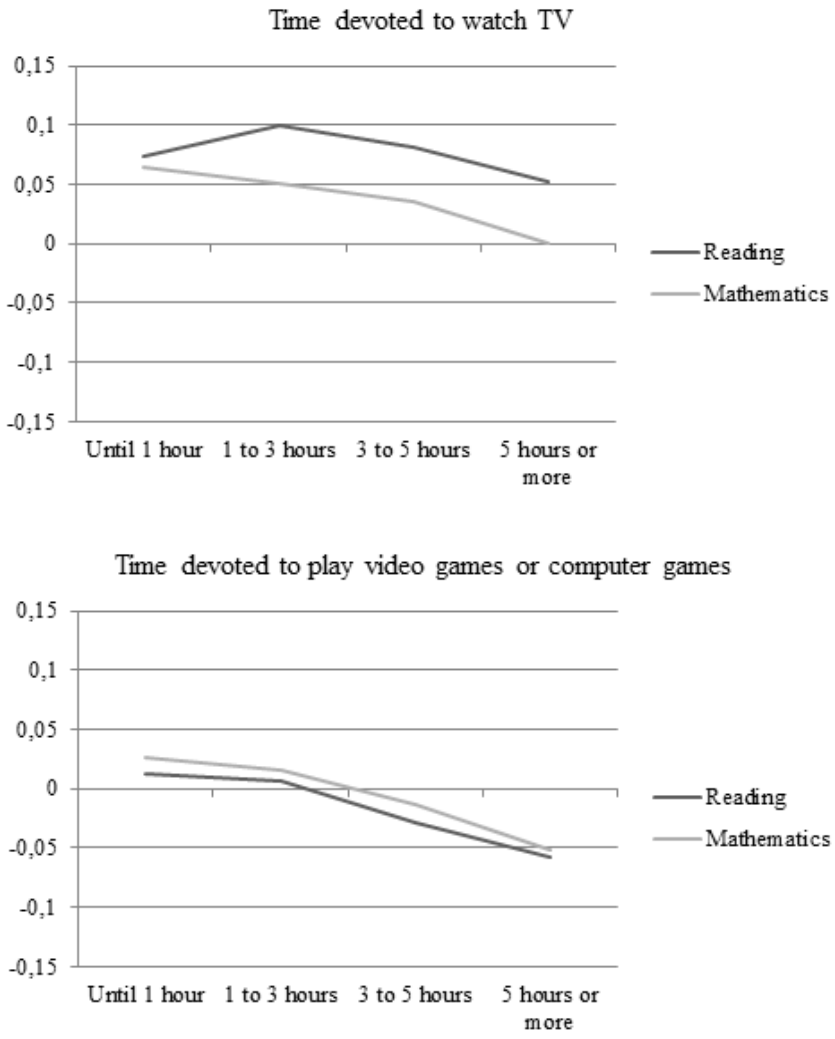
Appendix

FIGURE AI. Summary of the results reported in Tables I.a and I.b (Specification I, time-fixed effects column)



Notes: Non-significant coefficients have been included. The variable in the Y-axis are students' standardised scores.
Source: Authors' own calculations.

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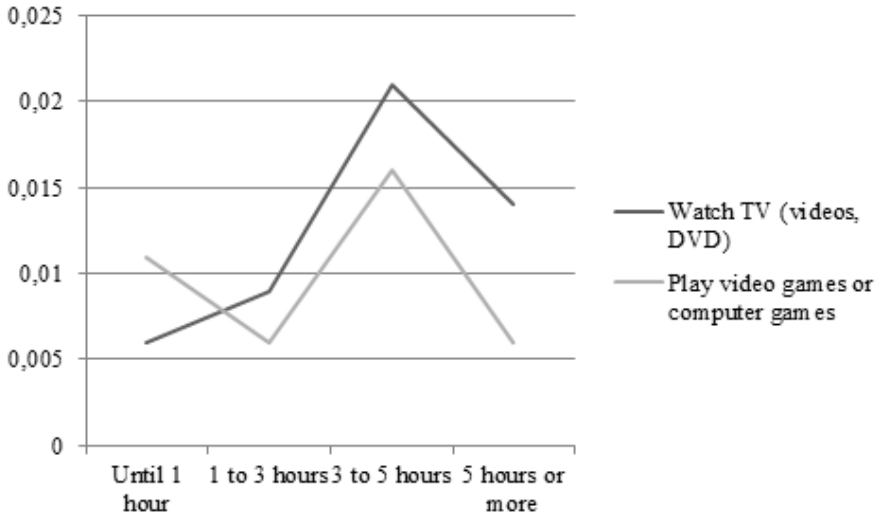
FIGURE AII. Summary of the results reported in Table II (Specifications I and III, time-fixed effects column)



Notes: Non-significant coefficients have been included. The variable in the Y-axis is students' likelihood of grade retention.
Source: Authors' own calculations.

TABLE AI. Descriptive statistics of 5th grade students in the course 2008/09

Variables		Obs.	Mean	S.D.
Scores 2008-09	**Reading**	76,244	68.139	17.208
	Mathematics	76,224	48.921	12.736
Sex	**Male**	78,413	0.514	0.500
	Female	78,413	0.486	0.500
Month of birth	**January**	61,992	0.085	0.279
	February	61,992	0.077	0.265
	March	61,992	0.084	0.278
	April	61,992	0.083	0.276
	May	61,992	0.085	0.279
	June	61,992	0.080	0.272
	July	61,992	0.084	0.277
	August	61,992	0.082	0.274
	September	61,992	0.088	0.283
	October	61,992	0.090	0.286
	November	61,992	0.079	0.270
	December	61,992	0.083	0.277
Repeater student in 2008-09	**No**	60,747	0.911	0.285
	Yes	60,747	0.089	0.285
Time devoted to watch TV (videos, DVD) each day	**5 hours or more**	60,885	0.076	0.265
	3 to 5 hours	60,885	0.113	0.317
	1 to 3 hours	60,885	0.283	0.450
	Until 1 hour	60,885	0.436	0.496
	No time	60,885	0.092	0.289
Time devoted to play video games or computer games each day	**5 hours or more**	61,305	0.095	0.293
	3 to 5 hours	61,305	0.088	0.283
	1 to 3 hours	61,305	0.186	0.389
	Until 1 hour	61,305	0.450	0.498
	No time	61,305	0.181	0.385
Level of education of the father	**Incomplete primary education or did not attend school**	58,376	0.170	0.376
	EGB or Compulsory Secondary Education	58,376	0.372	0.483
	High school, First Grade Professional Formation, Elemental Arts School and Artistic Professions, BUP, COU, Official Language School or Medium Grade Professional Formation Cycle	58,376	0.304	0.460
	Second Grade Professional Formation, Arts Speciality and Artistic Professions or High Grade Professional Formation Cycle	58,376	0.000	0.000
	University degree, PhD	58,376	0.154	0.361

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Level of education of the mother	**Incomplete primary education or did not attend school**	62,677	0.141	0.348
	EGB or Compulsory Secondary Education	62,677	0.406	0.491
	High school, First Grade Professional Formation, Elemental Arts School and Artistic Professions, BUP, COU, Official Language School or Medium Grade Professional Formation Cycle	62,677	0.289	0.453
	Second Grade Professional Formation, Arts Speciality and Artistic Professions or High Grade Professional Formation Cycle	62,677	0.000	0.000
	University degree, PhD	62,677	0.164	0.370
Occupation of the father	**Business managers or public administration**	57,981	0.055	0.228
	Technicians, professionals, scientists and intellectuals. Army (officials and high ranks)	57,981	0.125	0.330
	Technicians and support professionals. Administrative employees. Little business people	57,981	0.195	0.396
	Hotel workers, personnel, protection and sellers. Army (sub-officials and low ranks)	57,981	0.149	0.356
	Agriculture and fishing qualified workers. Artisans and qualified manufacturing, construction and mining workers	57,981	0.380	0.485
	Non-qualified workers	57,981	0.068	0.252
	Performing housework	57,981	0.007	0.083
	Inactive	57,981	0.021	0.142

Occupation of the mother	**Business managers or public administration**	61,551	0.021	0.142
	Technicians, professionals, scientists and intellectuals. Army (officials and high ranks)	61,551	0.105	0.307
	Technicians and support professionals. Administrative employees. Little business people	61,551	0.150	0.357
	Hotel workers, personnel, protection and sellers. Army (sub-officials and low ranks)	61,551	0.138	0.345
	Agriculture and fishing qualified workers. Artisans and qualified manufacturing, construction and mining workers	61,551	0.067	0.250
	Non-qualified workers	61,551	0.124	0.329
	Performing housework	61,551	0.379	0.485
	Inactive	61,551	0.016	0.127

Notes: "Obs." stands for "Observations" and "S.D." indicates "standard deviation".
Source: Authors' own calculations from DA 2008-09.

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TABLE AII. Gender and socio-economic differences in the time devoted to watch TV and play video games in the course 2008/09

		Sex of the student						Socio-economic status index tertile								
		Boys			Girls			Low			Medium			High		
Variables		Obs.	Mean	S.D.	Obs.	Mean	S.D.	Obs.	Mean	S.D.	Obs.	Mean	S.D.	Obs.	Mean	S.D.
Time devoted to watch TV (videos, DVD) each day	5 hours or more	31,038	0.098	0.297	29,847	0.053	0.224	16,516	0.094	0.291	16,789	0.074	0.261	17,098	0.055	0.228
	3 to 5 hours	31,038	0.130	0.336	29,847	0.096	0.294	16,516	0.119	0.324	16,789	0.116	0.321	17,098	0.105	0.307
	1 to 3 hours	31,038	0.304	0.460	29,847	0.261	0.439	16,516	0.258	0.438	16,789	0.288	0.453	17,098	0.305	0.461
	Until 1 hour	31,038	0.391	0.488	29,847	0.483	0.500	16,516	0.425	0.494	16,789	0.433	0.495	17,098	0.455	0.498
	No time	31,038	0.077	0.267	29,847	0.107	0.309	16,516	0.104	0.306	16,789	0.089	0.285	17,098	0.080	0.271
Time devoted to play video games or computer games each day	5 hours or more	31,365	0.143	0.350	29,940	0.045	0.207	16,660	0.125	0.330	16,894	0.090	0.287	17,209	0.061	0.239
	3 to 5 hours	31,365	0.118	0.323	29,940	0.056	0.230	16,660	0.094	0.292	16,894	0.091	0.288	17,209	0.078	0.269
	1 to 3 hours	31,365	0.224	0.417	29,940	0.147	0.354	16,660	0.167	0.373	16,894	0.201	0.401	17,209	0.197	0.397
	Until 1 hour	31,365	0.401	0.490	29,940	0.501	0.500	16,660	0.414	0.493	16,894	0.455	0.498	17,209	0.491	0.500
	No time	31,365	0.114	0.318	29,940	0.251	0.434	16,660	0.200	0.400	16,894	0.163	0.369	17,209	0.173	0.378

Notes: "Obs." stands for "Observations" and "S.D." indicates "standard deviation".
Source: Authors' own calculations from DA 2008-09.

TABLE AIII.a. The association of time devoted to watch TV (videos, DVD) with students' academic achievement. 8th grade repeaters' information in 2012-13

	Specification I				Specification II			
	Reading		Mathematics		Reading		Mathematics	
Variables	**OLS**	**FE**	**OLS**	**FE**	**OLS**	**FE**	**OLS**	**FE**
Time devoted to watch TV (videos, DVD) each day (Ref.: no time)								
5 hours or more	0.016	0.055***	0.090***	0.005	-	-	-	-
	(0.018)	(0.019)	(0.018)	(0.019)				
3 to 5 hours	0.232***	0.082***	0.282***	0.030**	-	-	-	-
	(0.015)	(0.015)	(0.015)	(0.015)				
1 to 3 hours	0.260***	0.100***	0.308***	0.052***	-	-	-	-
	(0.013)	(0.014)	(0.013)	(0.013)				
Until 1 hour	0.153***	0.070***	0.164***	0.064***	-	-	-	-
	(0.013)	(0.013)	(0.013)	(0.013)				
Time devoted to watch TV (videos, DVD) each day (quasi-continuous variable in hours)	-	-	-	-	0.149***	0.040***	0.176***	0.006
					(0.006)	(0.006)	(0.006)	(0.006)
Squared time devoted to watch TV (videos, DVD) each day (quasi-continuous variable in hours)	-	-	-	-	-0.027***	-0.007***	-0.029***	-0.002**
					(0.001)	(0.001)	(0.001)	(0.001)
Socio-economic status index	0.275***	0.033***	0.298***	0.042***	0.275***	0.034***	0.299***	0.042***
	(0.004)	(0.007)	(0.004)	(0.007)	(0.004)	(0.007)	(0.004)	(0.007)
8th Grade (Ref.: 5th Grade)	0.140***	0.174***	0.185***	0.240***	0.141***	0.175***	0.186***	0.240***
	(0.010)	(0.008)	(0.011)	(0.009)	(0.010)	(0.008)	(0.011)	(0.009)
School dummies	✓	✓	✓	✓	✓	✓	✓	✓
Constant	-0.470***	-1.358***	-0.956***	-1.039***	-0.397**	-1.311***	-0.881***	-0.989***
	(0.179)	(0.249)	(0.146)	(0.261)	(0.179)	(0.248)	(0.146)	(0.262)
Observations	75,716	75,716	75,946	75,946	75,716	75,716	75,946	75,946

Notes: Standard errors are in parentheses and robust. The thick (✓) means that a dummy for each school has been included.
Estimation method: Ordinary Least Squares (OLS) and Time Fixed-Effects (FE).
Dependent variable: Standardised scores using the mean and standard deviations of the total population for that particular DA cycle.
Coefficient: ***Significant at 1%, ** significant at 5%, * significant at 10%.
Source: Authors' own calculations.

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TABLE AIII.b. The association of time devoted to play video games or computer games with students' academic achievement. 8th grade repeaters' information in 2012-13

	Specification I				Specification II			
	Reading		Mathematics		Reading		Mathematics	
Variables	**OLS**	**FE**	**OLS**	**FE**	**OLS**	**FE**	**OLS**	**FE**
Time devoted to play video games or computer games each day (Ref.: no time)								
5 hours or more	-0.403***	-0.070***	-0.241***	-0.056***	-	-	-	-
	(0.013)	(0.015)	(0.013)	(0.014)				
3 to 5 hours	-0.142***	-0.026**	0.003	-0.005	-	-	-	-
	(0.012)	(0.013)	(0.012)	(0.013)				
1 to 3 hours	-0.043***	0.009	0.107***	0.015	-	-	-	-
	(0.009)	(0.010)	(0.009)	(0.010)				
Until 1 hour	-0.028***	0.011	0.065***	0.028***	-	-	-	-
	(0.008)	(0.009)	(0.009)	(0.009)				
Time devoted to play video games or computer games each day (quasi-continuous variable in hours)	-	-	-	-	0.016***	0.008	0.090***	0.009
					(0.006)	(0.006)	(0.006)	(0.006)
Squared time devoted to watch TV (videos, DVD) each day (quasi-continuous variable in hours)	-	-	-	-	-0.013***	-0.004***	-0.022***	-0.004***
					(0.001)	(0.001)	(0.001)	(0.001)
Socio-economic status index	0.267***	0.031***	0.291***	0.040***	0.267***	0.031***	0.292***	0.040***
	(0.004)	(0.007)	(0.004)	(0.007)	(0.004)	(0.007)	(0.004)	(0.007)
8th Grade (Ref.: 5th Grade)	0.176***	0.185***	0.227***	0.247***	0.179***	0.184***	0.225***	0.245***
	(0.010)	(0.008)	(0.011)	(0.009)	(0.010)	(0.008)	(0.011)	(0.009)
School dummies	✓	✓	✓	✓	✓	✓	✓	✓
Constant	-0.122	-0.183	-0.642***	1.120***	-0.148	-0.186	-0.623***	1.127***
	(0.195)	(0.310)	(0.191)	(0.226)	(0.195)	(0.311)	(0.191)	(0.228)
Observations	75,846	75,846	76,072	76,072	75,846	75,846	76,072	76,072

Notes: Standard errors are in parentheses and robust. The thick (✓) means that a dummy for each school has been included.
Estimation method: Ordinary Least Squares (OLS) and Time Fixed-Effects (FE).
Dependent variable: Standardised scores using the mean and standard deviations of the total population for that particular DA cycle.
Coefficient: ***Significant at 1%, ** significant at 5%, * significant at 10%.
Source: Authors' own calculations.

Home numeracy activities in relation to basic number processing in kindergartners[1]

Actividades aritméticas en el hogar en relación con el procesamiento numérico básico en alumnos preescolares

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Abstract

Recent research has shown that home numeracy activities play an important role in children´s math achievement. In spite of this, findings are not consistent. This study tries to shed light on the relation between home numeracy activities and specific mathematical skills. More specifically, between formal and informal home numeracy activities and mapping skills, symbolic number processing skills and non-symbolic number processing skills. Participants were 212 kindergartners and their families. Students were assessed on symbolic, non-symbolic and mapping tasks. Families completed a home numeracy questionnaire. Hierarchical regression analyses showed that formal home numeracy activities, in addition to general cognitive abilities, predict number processing achievement, exactly, on mapping tasks. These results were interpreted in terms of their educational implications because maths is a prime educational objective. In this sense, we reflect on the importance of knowing when and how home numeracy activities take place, by their relevance on the support to children´s learning at school.

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Key words: Formal home numeracy activities, Informal home numeracy activities, basic number processing, kindergartners, math achievement.

Resumen

Investigaciones recientes han mostrado que las actividades aritméticas que se desarrollan en el hogar juegan un papel importante en la ejecución matemática de los niños. A pesar de ello, los resultados encontrados no son muy consistentes. Este estudio trata de arrojar luz en las relaciones entre las actividades aritméticas del hogar y habilidades de procesamiento numérico. Concretamente, entre las prácticas aritméticas formales e informales del hogar y las habilidades de proyección, de procesamiento numérico simbólico y no simbólico. Los participantes fueron 212 estudiantes de tercer curso de educación infantil y sus correspondientes familias. Los estudiantes fueron evaluados en tareas de procesamiento numérico simbólico, no simbólico y de proyección. Las familias completaron un autoinforme de prácticas aritméticas en el hogar. Los análisis de regresión muestran una asociación negativa entre la práctica formal, además de las habilidades cognitivas generales, y la ejecución en procesamiento numérico básico, concretamente, en tareas de proyección. Estos resultados se interpretan en términos de sus implicaciones educativas ya que las matemáticas son un objetivo educativo primordial. En ese sentido, se reflexiona sobre la importancia de conocer cuándo y en qué consisten las prácticas aritméticas en el hogar, dada su relevancia en el apoyo al aprendizaje de los niños en la escuela.

Palabras clave: Actividades aritméticas formales en el hogar, actividades aritméticas informales en el hogar, procesamiento numérico básico, educación infantil, ejecución matemática.

Introduction

Children show large differences in mathematical skills when they enter school for the first time (Aunola, Leskinen, Lerkkane & Nurmi, 2004). Previous research has attributed these differences to the variability of general cognitive factors, such as intelligence or working memory (Passolunghi & Lanfranchi, 2012) or of domain specific factors, such as basic numerical competence (Halberda, Mazzocco & Feigenson, 2008). In other cases, research has resorted to contextual factors as explicative elements (Butterworth, 2005). In this sense, the mathematical environment that is created at home and its impact on students' performance have been the focus of attention for some time (Blevins-

Knabe, 2016; De Smedt, Verschaffel & Ghesquière, 2009 o Sasanguie, De Smedt, Defever & Reynvoet, 2012). The reasons for this interest are evident: if mathematical skills are essential for academic success, we need detailed knowledge about the factors determining its development and, therefore, some progress on the knowledge about the real impact that family environments have is needed, among other things. Despite the relevance of this topic, previous research analysing the relationships between home mathematical environment and children's performance show inconsistent findings. For example, despite initial promising results, several studies have found negative or inconsistent correlations, or simply no correlations at all (Missall, Hojnoski, Caskie & Repasky, 2015). For this reason, the present study analyses the relationships among formal and informal numeracy practices that parents perform with their children and their children's basic numeracy skills. Thus, we expect to find new data that contribute to clarify the role of family numeracy practices and their impact on the development of specific mathematical skills.

Home numeracy environment and mathematical competence development

Beyond structural characteristics of home, like socioeconomic status, education of parents or family involvement, the quality of home learning environments has been related to children's development. For example, this learning environment created at homes has shown to be a strong predictor of both children's cognitive development and subsequent academic achievement (Bradley & Corwyn, 2016 o Kluczniok, Lehrl, Kuger & Rossbach, 2013). Specifically, research has highlighted that home mathematical environment plays an important role in the development of children's mathematical skills (Hart, Ganley & Purpura, 2016). This is easy to understand if we think about how the first numeracy skills children acquire predict posterior achievement, so what they do at home with their parents should play a fundamental role in the development of subsequent skills (Hart et al., 2016). It is known, for example, that there are individual differences in basic numeracy skills before children start Primary Education, and these skills are related to mathematical achievement at a later age (De Smedt et al., 2009; Orrantia et al., 2017; Sasanguie et al., 2012).

More specifically, home arithmetic environment refers to the principles, beliefs, knowledge, experiences and attitudes, as well as to the practices and physical resources that are present at home which promote the development of arithmetic skills in children (Street, Barker & Tomlin, 2008). For example, one of the key variables that has proven effective to assess the home environment has been the way in which parents encourage their children to focus their attention on those tasks they consider most important for their development (Bradley & Corwyn, 2016). In this case, one of the most common measures to assess the home environment has been the frequency of numeracy activities performed at home (Le Fevre et al., 2009).

The pioneer study by Blevins-Knabe and Musun-Miller (1996) analysed the relationship between the frequency of activities that were performed at home and which involved the use of numbers (for example, naming numbers or performing simple additions like 1+1=2) and children's mathematical achievement. Results showed a positive correlation between that frequency and mathematical achievement, which was assessed using standardized tests such as TEMA-2 (Ginsburg & Baroody, 1990). In this line, Le Fevre et al. (2009) have later made a distinction between the different experiences that are offered to children depending on their parents intentions. Specifically, they distinguished between formal and informal numeracy practices. The former ones focus on the use of numbers with the intention of improving children's numeracy skills (for example, counting objects, learning the numbers or learning how to write them). On the other hand, in informal practices the learning of numeracy skills occurs in an incidental and indirect manner (for example, playing card games or any other everyday activity that involves numbers). In their study, LeFevre et al. (2009) analysed how frequently these kind of activities were performed at home. They also assessed mathematical achievement using *KeyMath* (Connolly, 2000). Results showed a direct relationship between formal and informal practices and achievement, concluding that both types of activities are relevant to the development of numeracy skills. Similar longitudinal studies (Niklas & Schneider, 2014) have shown that these results hold after a year.

Home numeracy environment and basic numeracy skills

Despite these promising studies, the results obtained in previous research are not as consistent as could be desired. In some occasions, the

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relationships between the frequency in which parents reported to train numeracy skills at home and their children's performance have been negative. As previously mentioned, Blevins-Knabe and Musun-Miller (1996) found this kind of relationship between home environment and some specific numeracy skills such as reciting the numbers from 1 to 10.

In some other occasions, results do not align with these results. For example, the study by LeFevre et al. (2009) found positive relationships between informal practices at home and children's mathematical achievement. However, in a posterior study, LeFevre, Polyzoi, Skwarchuk, Fast and Sowinski (2010) found opposite results compared to their previous work. Specifically, their results showed how formal practices, and not informal ones, were the ones related to children's achievement.

Yet in some other studies there was simply no relationship of any kind between the frequency of home formal practices and children's performance. Specifically, the study by Manolitsis, Georgiou, and Tziraki (2013) showed no relationship between the frequency of home formal practices and children's performance on basic number processing tasks such as seriation, counting or digit magnitude comparison.

One of the arguments that have been proposed to explain these contrasting results has focused on the tests used to assess children's mathematical performance. The measures used to assess students' achievement have often been obtained through standardised tests that offer global performance scores, such as TEMA-2, TEMA-3, *KeyMath Test* or *Early Numeracy Test*. Therefore, it has been very difficult to stablish relationships between home practices and specific skills (Mutaf-Yidiz, Sasanguie, De Smedt & Reynvoet, 2018a). For example, the results reported by LeFevre et al. (2009) were obtained assessing mathematical knowledge through a composite of three subtests of the *KeyMath Test* (Connolly, 2000). Specifically, they assessed math concepts (quantity, digit recognition, place value, and order), arithmetic (addition and subtraction, in both symbolic and non-symbolic manners) and mathematical fluency (time taken to solve single-digit addition problems). This way, they found that both formal and informal practices were related to arithmetic, while math concepts were related only to informal practices, but not to formal ones. In this sense, Skwarchuck, Sowinski and LeFevre (2014) assessed children's numeracy skills using only the math concepts subtest of the *KeyMath Test*. In this case, they found positive relationships between symbolic knowledge and formal practices and between non-symbolic knowledge and informal practices.

This reasoning has led recent research to focus on the relationship between home numeracy environment and mathematical performance, assessing the latter in a much specific manner. Thus, one of those specific measures that has been recently used is basic numeracy skills. The rationale for its use is fully justified. The role this skill plays, both in its symbolic and non-symbolic variant, on the development of subsequent mathematical achievement has been extensively studied (for a review, see Gebuis and Reynvoet, 2015). Specifically, it is known that there is a strong relationship between symbolic numeracy skills and mathematical performance and also, though to a lesser extent, between non-symbolic numeracy skills and mathematical performance (see Schneider et al., 2017, for a review).

Nowadays, there are only two studies that have analysed both home numeracy environment and children's basic number processing skills. In the first one, Benavides-Varela et al. (2016) obtained information from the home numeracy environment through interviews to parents and their children (using the self-report questionnaire created by LeFevre et al., 2009) and correlated it with numeracy exact representations (counting, correspondence and everyday numeracy problems) and with approximate representations (non-symbolic magnitude comparison and estimations on the number line). The results showed positive correlations between home numeracy environment and exact representations, however, no correlations were found with approximate representations. The second study is the one by Mutaf-Yidiz et al. (2018a). In this case, the authors aimed to clarify the relationships between home numeracy environment, both formal and informal, as assessed through the same self-report by LeFevre et al. (2009), and children's performance on basic number processing skills. Specifically, they assessed children's performance using symbolic and non-symbolic specific measures (symbolic and non-symbolic comparisons, and symbolic and non-symbolic estimations on the number line). Results showed a positive relationship between home numeracy environment and symbolic numeracy skills (specifically with the estimation task) and also with mapping skills (in particular with the enumeration task).

The present study analyses the relationships between home formal and informal numeracy environment and children's basic number processing skills. In line with prior research, home formal and informal numeracy practices were assessed using the self-report created by

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LeFevre et al. (2009) and basic symbolic, non-symbolic and mapping numeracy skills were assessed using specific tasks similar to those implemented by Mutaf-Yidiz et al. (2018a). Therefore, the present study deviates from the one by Benavides-Varela et al. (2016), despite assessing parents using the self-report by LeFevre et al. (2009), and it is more in line with the study by Mutaf-Yidizet al. (2018a) with the exception that the three limitations these authors commented have been considered and overcome: sample size has been increased, intelligence as a control variable has been incorporated and a heterogeneous socioeconomic sample has been considered, according to the highest education level achieved by parents, while the prior study only considered families with medium-high levels of education. Lastly, this is the first study of this kind undertaken in Spain, contributing highly relevant data about this topic in our country, allowing comparisons with the results obtained in other groups and cultures (Blevins-Knabe, 2016). In line with the results obtained in the aforementioned studies, we expect to find a positive relationship between home numeracy environment and symbolic and mapping skills, as well as a lack of relationship with non-symbolic skills.

Method

Sample

In the present study participated 304 kindergarten students and their respective families, from two schools situated in a medium socioeconomic neighbourhood in Spain. To this end, an intentional non-probabilistic sampling was used.

From the total sample, 92 participants were excluded because the self-report by the parent was incomplete, the student was absent the day of assessment or the child was transferred to another school.

The final sample was composed of 212 students and their respective families (47.6% from one school and 52.4% from the other). Students age (40.4% girls and 59.6% boys) at the start of the study oscillated between 65 and 76 months (M=70.08; SD=3.25). Parents (20.3% fathers and 79.7% mothers) reported to have Spanish as mother tongue in 97.9% of the cases, Russian and Arabic in a 0.7% each and 0.7% did not answer this question. Also, 64.1% of parents had university degrees, 15.9% had

vocational training, 13.8% had school-level education and 6.2% did not answer this question.

Materials

Home numeracy practices

Parents completed a translated and adapted to Spanish version of the self-report created by Skwarchuk et al. (2014), which was based on the one designed by LeFevre et al. (2009).

Formal numeracy practices were assessed using 17 items: 13 focused on home numeracy learning tasks (i.e. "I help my child to think, measure and compare magnitudes", see Table I) and 4 items asked about non-numeracy tasks to reduce the academic bias. These latter items were not included in the analyses ("my child plays computer games that involve numbers"; "I encourage my child to pretend while playing", "I ask my child to answer a question very quickly", "we time how fast an activity can be completed"). Parents reported the frequency they performed each of the activities on a scale from 0 to 4 (0 = rarely or never, 4 = most days per week).

Informal numeracy practices (exposure to number games) were assessed using a list of games. In order to adapt this list to the Spanish context, a sales department in Spain facilitated a list with the most sold games to children ranging from 3 to 6 years old. These games were classified depending on whether they included numeracy elements or not. The final list was composed of 25 games ordered alphabetically: 10 numeracy games, 10 non-numeracy games and 5 made up games that did not existed (see Appendix). Parents were asked to indicate the names of those games they recognised without checking the answers at home. To calculate the score for the informal numeracy practices the formula proposed by Skwarchuk et al. (2014) was used: [(numeracy games - games that did not exist) / 10] x 100. For example, if parent selected 5 numeracy games and 1 non-existent game, the score would be [(5-1)/10] x 100 = 40%. Scores were standardized and saved as z-scores for subsequent analyses.

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Basic number processing skills

Non-symbolic number processing skills

No-symbolic number processing skills were assessed using the Panamath (Halberda and Ly, 2013). Participants had to select the set with greater number of dots (blue or yellow) from the two that were presented at each side of the computer screen, pressing the key "S" (more dots on the left) or "L" (more dots on the right). Numerosities ranged from 4 dots to 15, using 4 different ratios (.50, .66, .75 y .86). The task included 56 trials and 4 practice ones. Each trial started with a fixation point (1000 ms) followed by the sets of dots to compare, which were presented a limited time (2000 ms) to avoid counting. Next trials appeared when the experimenter pressed the space bar. In half of the trials the set of yellow dots was the more numerous and in the other half it was the set of blue dots. To prevent using strategies based on continuous variables (dot size, area, luminosity) a default radio for dots was set at 60 pixels, and the maximum variability in size was ±35%; also, in half the trials the area of the dots decreased with numerosity, while in the other half it increased. The final score for this task was the percentage of correct answers.

Symbolic number processing skills

Participants had to choose as fast as possible the greater number between two Arabic numerals (1 to 9) presented simultaneously at each side of the screen, pressing the "S" (if the greater number was on the left) or the "L" (if the greater number was on the right). Each trial started with a fixation point (1000 ms) and the numbers stayed on the screen until the child pressed an answer. The distance between the numbers presented ranged from 1 to 5, and there were 8 trials for each combination of distances, so a total of 40 trials and 3 practice ones were used. The final score for this task was the percentage of correct answers.

Mapping skills

Mapping skills were assessed and adaptation of the tasks proposed by Mundy and Gilmore (2009). Participants were presented an Arabic numeral and two sets of dots. Participants then had to choose the set of dots that corresponded to the Arabic numeral, pressing "S" (set of dots on the left) or "L" (set of dots on the right). The task included 24 trials and 2 practice ones, and all information remained on the screen until an

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answer was given. Numerosity ranged from 1 to 9, with 12 trials using long distances (i.e. 1-4 dots) and 12 trials using short distances (i.e. 6-5 dots). The final score for this task was the percentage of correct answers.

Control variables

Intelligence

The Spanish version of the Raven's Progressive Matrices (Raven, Court & Raven, 1992) was used to assess cognitive performance. The score for this test was the amount of correct answers.

Procedure

Prior to the experiments, all parents were asked to sign an informed consent. The study only included those children whose parents accepted their participation.

Parents completed the self-report during April and their children were assessed in May before finishing Kindergarten.

Children were assessed individually for the intelligence test and the basic number processing tasks by an expert in a quiet room in their school. Basic number processing tasks were designed using the software SuperLab and were presented in a fixed order on a laptop which only showed the two keys that participants had to press.

Statistical analyses were performed using SPSS Statistics 22 and AMOS. Descriptive analyses, Spearman correlations and regression analyses were performed.

Results

Home numeracy practices

The minimum score for informal practices (M=3.17, SD=1.49) was 0 and the maximum was 8. Internal consistency for the formal practices scale was α=.83 and a factorial analysis showed no need to eliminate any item, since all of them contributed significantly to the factor ($\alpha \geq .4$, Morales, 2000).

TABLE I. Descriptive statistics of home formal numeracy practices

Item	M	SD	AFC
I help my child learn simple sums (e.g.: 2+2) *	3.20	1.14	.59
I encourage my child to do math in his/her head*	3.29	.95	.52
I help my child weigh, measure, and compare quantities*	1.73	1.42	.57
We play games that involve counting, adding, or subtracting*	2.60	1.13	.68
We sort and classify by color, shape, and size*	1.66	1.31	.44
I ask about quantities (e.g., How many spoons?)*	2.58	1.26	.48
We play board games or cards*	2.17	1.07	.56
I help my child to recite numbers in order*	2.60	1.27	.62
We sing counting songs (e.g., the numbers song)*	1.56	1.37	.47
I encourage the use of fingers to indicate how many*	1.86	1.60	.40
I teach my child to recognize printed numbers*	3.00	1.27	.68
I encourage collecting (e.g. cards, stamps, rocks)*	1.61	1.52	.53
We talk about time with clocks and calendars*	2.56	1.38	.40

Note. Question for the parents, "How frequently do you do the following tasks with your child?". The response options were: *rarely or never* (0), *monthly* (1), *weekly* (2), *several days per week* (3), and *most days per week* (4). The range of responses on all ítems was 0 to 4.

*Items included in the analysis

A confirmatory factorial analysis showed good indexes of absolute adjustment (CMIN/DF, RMSEA and RMR) and goodness of fit (PCFI and AIC), while the incremental adjustments measures (IFI and CFI) were slightly lower than the commonly accepted standard. See Table II for more information.

TABLE II. Goodness of fit statistics of the model

	CMIN/DF	RMSEA	RMR	IFI	CFI	PCFI	AIC
Acceptance level*	< 5.0	< .08	< .08	> .90	> .90	> .50	
Model	2,78	.072	.070	.831	.834	.692	258.921

Note. *Based on Kline (2010) and Galindo-Domínguez (2019)

Basic number processing skills

Descriptive statistics of basic number processing skills can be seen on Table III.

TABLE III. Descriptive statistics of basic number processing skills.

Variables	M	SD	Min	Max
Symbolic numeracy	.91	.10	.43	1
Non-symbolic numeracy	.78	.098	.45	.98
Mapping skills	.90	.13	.25	1

Correlations

Spearman bivariate correlations were used to analyse the relationship between home numeracy practices and basic number processing skills, controlling for intelligence (Table IV).

Formal numeracy practices were negatively correlated with children's mapping skills, reaching the significance level. These results show how children who do more formal numeracy tasks at home with their parents, such as simple additions (e.g.: 2+2) had lower performance in tasks connecting symbolic and non-symbolic numeracy skills. However, there was no significant correlation with symbolic and non-symbolic performance. Despite this lack of significance, there was a clear negative tendency in all correlations. This indicates how home formal practices are associated to a lower performance on basic number processing skills.

No significant correlations were found between informal practices and basic number processing skills.

Focusing now on home numeracy practices, a significant correlation was found between formal and informal practices. This result suggests that those parents who promote tasks such as simple additions (e.g.: 2+2) have a higher knowledge of numeracy games (e.g.: number rods).

Basic number processing skills were positively correlated with each other.

As expected, intelligence was positively correlated with numeracy outcomes, reaching the significance level. Furthermore, higher intelligence scores were significantly associated to lower frequency of home numeracy practices promoted by parents, as well as to lesser knowledge of numeracy games.

TABLE IV. Bivariate correlations between home numeracy practices and basic number processing skills, controlled by intelligence.

Variables	1	2	3	4	5	6
Control variable						
1. Intelligence	-					
Home numeracy practices						
2. Formal practices	-.210**	-				
3. Informal practices	-.094	.108	-			
Basic number processing skills						
4. Symbolic numeracy	.185**	-.016	.041	-		
5. Non-Symbolic numeracy	.228**	-.098	.017	.379**	-	
6. Mapping skills	.314**	-.135*	.121	.350**	.346**	-

Note. p<.05*, p<.01**.

A stepwise multiple linear regression was performed to analyse the contribution of the control variable and home numeracy practices on basic number processing skills (Table V). Dependent and independent variables were determined according to the significance obtained on the previous correlations. This way, step 1 included intelligence as a control variable. Step 2 included the home numeracy practices that significantly correlated to basic number processing skills. This allows to calculate the variance in basic number processing skills that can be attributable to home numeracy practices, beyond the variance explained by general cognitive ability.

The Durbin-Watson statistic and the Variance Inflation Factor (VIF) were calculated, confirming the independence of errors (d=1.98) and the lack of multicollinearity (1.04 for both values).

TABLE V. Regression analyses.

MAPPING SKILLS				
Step	**Predictor**	β	**t**	**R^2**
1	Intelligence	.005	2.916**	.049
2	Formal practices	-.002	-1.615*	.061

Note. p <.05*, p <.01**, p=.10**

The complete model explained 6.1% of the variance of mapping skills (F=6.702. p=.002), so the inclusion of formal practices adds a 1.2% to the variance explained by general cognitive ability on its own (F=10.76, p=.001), this difference being marginally significant (p=.10).

Discussion and Conclusions

The present study analyzed if formal and informal numeracy practices that parents perform at home are related to symbolic and non-symbolic number processing skills, as well as to mapping skills. To assess home practices an adaptation of the self-report by Skwarchuk et al. (2014), based on the work by LeFevre et al. (2009), was used, while the basic number processing skills were assessed through three tasks focusing on symbolic number processing, non-symbolic number processing and mapping skills. This research answered to the need emphasized by Blevins-Knabe (2016) and to the limitations highlighted by the previous work (Mutaf-Yidiz et al., 2018a): greater sample size, taking into account intelligence as a control variable, considering fathers as well as mothers, and a more heterogeneous socioeconomic profile, as indicated by the highest level of education of the parent filling the self-report (from elementary school education to university degrees).

Correlation and regression analyses showed that home numeracy practices, formal practices in particular, were negatively and significantly associated with mapping skills, but not with the rest. These results are in line with the study previously commented. Just like Mutaf-Yildiz et al. (2018a) explained, increasing sample size in the present study confirmed the relationship between formal practices and mapping skills. Similarly, the present results show that children's scores in symbolic comparisons are not significantly associated with how frequently parents encourage numeracy practices at home. The same goes for non-symbolic tasks (in line with the findings by Benavides-Varela et al., 2016). Despite the relationship between formal practices and symbolic and non-symbolic skills was non-significant, there is a tendency towards a negative relationship (Table III), in fact, Mutaf-Yildiz et al. (2018a) obtained results close to zero when correlating these variables. It is possible that this correlation reaches the significance level if an even greater sample size is used.

This negative tendency in the association of formal numeracy practices with symbolic, non-symbolic and mapping skills is coherent with the negative significant relationships between formal practices and the control variable intelligence. A potential explanation for this result put forward by previous studies is that parents tend to get involved more frequently when they suspect something is not going well with their children's mathematical performance. For example, Saxe, Gubermen and Gearhart (1987) highlighted how parents change the way they interact with their children to adapt to their development. However, this is not the only explanation. Other authors have suggested that there is a possibility that families do not always know clearly which the most appropriate numeracy tasks are for each age (Fluck, Linnell & Holgate, 2005; Skwarchuk, 2009). In this sense, the low frequency of these practices would be explained by parents' lack of knowledge of the most suitable tasks for each age. On the other hand, Sonnenschein et al. (2012) have emphasized the fast development of numeracy skills at that age, and how this fact causes parents of younger children to engage more frequently in *basic* tasks, such as identifying shapes, compared to parents of older children, who engage more frequently in more *complex* tasks, such as writing numerals or doing additions and subtractions. Therefore, it could be the case that parents engage more frequently in basic activities if they realize something is not going as expected in their children's numeracy skills development.

On the other hand, informal numeracy practices are not associated with symbolic, non-symbolic or mapping skills. These results are in line with two previous studies. On the first, Benavides-Varela et al. (2016) found no significant correlations with non-symbolic comparisons. On the other one, Mutaf-Yildiz et al. (2018a) only found a relationship between "applications" and symbolic number line estimation tasks. A potential explanation is that home practices might not be related to all basic number processing skills in the same way (Benavides-Varela et al., 2016).

To sum up, formal numeracy practices would have a greater impact than informal practices on one of the basic number processing skills considered in this study (mapping skills). In line with LeFevre et al. (2010) it seems that formal numeracy practices performed at home, and not informal numeracy practices, are the ones related to children's numeracy performance, at least in the case of mapping skills, in a negative direction. In fact, taking into account formal practices, in addition to

general cognitive ability, had an explicative power of 6.1%. Although these effects were small, similar to those obtained in previous studies (5.6% to 6.4%), this study corroborates that parents play a role in their children's development of basic number processing skills (Kleemans, Peeters, Segers & Verhoeven, 2012; LeFevre et al., 2009; Mutaf-Yildiz et al., 2018a). More specifically, numeracy tasks performed at home such as counting, writing numerals or doing simple additions, are related to children's mapping skills.

These results confirm once more the lack of agreement in the most recent literature on the impact of home practices on the development of mathematical skills. However, these conclusions must be taken cautiously, since the present study has limitations due to the instrument used to assess home numeracy practices. For example, the list of games that involved numbers that was used to assess informal practices might have been just a sample of all the potential games with those characteristics. Keeping this in mind, the results obtained have some implications for the educational field. In a recent study (Susperreguy, Douglas, Xu, Molina-Rojas, in press) it is highlighted the role that the difficulty of the tasks, children's age and type of measures considered have to explain research findings. However, results are more consistent when formal practices are considered, in contrast to informal ones, as well as when specific outcome measures are considered over global measures, it would be important to assess home formal practices much more specifically and using a wider variety of measures. In this sense, a recent study has found a lack of relationship between the frequency of home numeracy tasks, measured through self-reports and observations of parent-child interactions in semi-structured situations in which they solved puzzles using LEGO pieces (Mutaf-Yildiz et al., 2018b). Actually, both ways of assessing what happens at home have limitations. Despite finding a reliability score over .80 on the present study, self-reports have strong social desirability effects and rely too strongly on the participant's memory. On the other hand, direct observation of interactions at home is affected by the presence of the observer, who evidently changes the normal behaviour of parents and children (e.g. Gravetter & Forzano, 2006).

Lastly, we should not forget the role of cultural differences when explaining the results obtained. Different studies have shown the cultural differences in the way parents interact with their children when performing mathematical tasks together (Blevins-Knabe, 2016). For example, Chinese-

American families put more emphasis on these tasks than their Euro-American counterparts (Pan, Gauvain, Liu & Cheng, 2006). Also, Greek families seem to be less involved than Canadian families (LeFevre et al, 2010), moreover, these same authors report differences between Canadian families depending on whether they are French or English speakers. For this reason, studies like the present one have great relevance since it shows how Spanish families behave for the first time, contributing novel data to the one we already possess. Furthermore, families' social background determines the level of implication at home (Vandermaas-Peeler & Pittard, 2014). Although these results are not conclusive, they suggest that there are differences in the way to engage tasks at home. Thus, families' different cultural, social or economic backgrounds seem to relate to different perceptions on the value of mathematics, impacting the level of engagement with their children's tasks.

Being such a strong cultural tool, mathematics has become a key objective in education. For this reason, it is extremely important to know how parents help their children, supporting teachers' work at schools. Even more considering that, according to Fluck et al. (2005) or Skwarchuk (2009), parents do not always know the appropriate numeracy tasks for their children's age. There is no doubt that this support is essential in cases of learning disabilities related to math, and, from a prevention perspective, it would be important to promote these kind of tasks at home.

Studies like the present one helps to develop a wider understanding of the relationships between family environment and the development of mathematical competence.

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Appendix

TABLE V. List of games ordered alphabetically

Game	Game
1 2 3 Periquitos	Monster Castle
Ábaco	Mutant busters
Activity play matemático	Pacto entre caballeros
Bingo números	*Recogiendo pimientos*
Cartas minusplus	**Regletas**
Exasperation	Scout y Violeta
Forraje en el bosque	*Sumando piezas*
GoGo	**Súper espía de las mates**
Gormiti	Telepods
Matemática puzzle autocorrectivo	Vip pets
Matemáticas mágicas	Wall Tracks
Mila y Malo	**Yo aprendo a contar**
Miniarco	

Note. Games involving number are shown in bold font; games that do not exist are shown in italics. Instructions for parents: "Below there is a list a games for kindergartens. Some of them are popular and some of them do not exist. Please, read the names and indicate those games you can recognise. Do not guess, just indicate those games you can recognise. Please, give an answer without checking the response at home".

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Educational disengagement profiles: a multidimensional contribution within basic Vocational Education and Training[1]

Perfiles de desconexión educativa: una aproximación multidimensional en la Formación Profesional Básica

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Abstract

Early school dropout is one of the most concerning educational indicators, exerting a large negative impact on young people's educational and transitional outcomes. The needs of young people include active engagement and participation in both educational and work settings. Refinement and expansion of vocational education/training is considered an important strategy for decreasing dropout rates and, as well, improving young people's educational and transitional processes. The current work aims to delineate how the dropout profiles of young people involved in Catalan basic vocational education and training programmes might negatively impact their educational and transitional prospects. The approach taken is within the multidimensional construct of student engagement theory and, specifically, from disengaged students' profiles. A questionnaire, integrating four dimensions – one involving collecting personal and educational data and three that collected data based on the students' behavioural, cognitive

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and emotional engagement – was designed as a data collection technique. It was given to a sample of 277 youths who were involved in some of the 24 basic VET programmes that ran in 14 centres of Barcelona and its surrounding regions. The descriptive and inferential analysis of the engagement dimensions, educational factors, and sociodemographic variables – which become more significant in relation to disengagement profiles within the framework of the basic VET programmes of these young people's profile – show a group of youngsters who agree with the behaviourally disengaged profile (in males) and cognitively and emotionally disengaged profile (in youth from immigrant conditions and from lower socioeconomic status). Despite these risk factors, there also are positive ones. Indeed, these results bring us closer to the problems related to students' dropout. Knowing that young people report disengagement on the three engagement dimensions can help predict young people's risk of dropping out and identify which difficulties they could have to meet successful educational ad transitional processes.

Keywords: dropout, student participation, vocational training, unqualified young people, transition

Resumen

El abandono escolar prematuro es uno de los indicadores educativos que más preocupa por su impacto en los procesos educativos y de transición de los jóvenes. Éstos llevan implítico la necesidad de participación y compromiso activos en contextos educativos y laborales. El desarrollo de la formación profesional se considera estratégico para disminuir las tasas de abandono y para mejorar estos procesos educativos y de transición. Este trabajo tiene como objetivo reflexionar, en el marco del constructo multidimensional del student engagement y, específicamente, de los perfiles de desconexión de los estudiantes, sobre cómo los perfiles de abandono de los jóvenes que participan en programas catalanes de formación profesional básica podrían afectar a sus procesos educativos y de transición. Como técnica de recopilación de datos se diseñó un cuestionario, integrado por cuatro dimensiones una para recopilar datos personales y educativos y tres para recopilar datos basados en el compromiso conductual, cognitivo y emocional de los estudiantes, que se pasó a una muestra de 277 jóvenes participantes en alguno de los 24 programas PFI de 14 centros de Barcelona y su provincia. El análisis descriptivo e inferencial de las dimensiones y de los factores educativos y variables sociodemográficas que resultan significativas en relación con los perfiles de desconexión en el marco de los programas PFI del perfil de estos jóvenes identifica principalmente dos tipos de perfiles. Los conductualmente desconectados (en chicos) y los cognitiva y emocionalmente desconectados (en jóvenes inmigrante y de bajo nivel socioeconómico). A pesar de estos factores de riesgo, también se identifican factores positivos. Estos resultados nos aproximan a los problemas vinculados al abandono. Conocer cómo los jóvenes reportan su desconexión en las tres

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dimensiones del student engagement puede ayudar a predecir su riesgo de abandono e identificar qué dificultades podrían tener para enfrentar procesos educativos y de transición exitosos.

Palabras clave: abandono de estudios, participación de los estudiantes, formación profesional, jóvenes sin cualificación, transición.

Introduction

The study of vocational education and training (VET) level among young people in Spain between the ages of 18 and 24 shows a high percentage of this demographic with lower studies (which culminate in the mid-range level of education; MECD, 2015). These data are critical: they relate not only to early dropout rates but also to the risk these students have of dropout and, further, the difficult educational and transitional processes, they thereafter face (given the longitudinal and permanent nature of such transitions) (Azorín, 2019; Moreno Mínguez, 2019).

In this work, it is necessary to define early school leaving (ESL) –or early leaving from education and training (ELET)– and dropout. According to the EU's definition (European Commission, 2015, p. 6) and Cedefop (2016, p. 31), while ESL is understood as the percentage of young people (aged 18 to 24) who attained only lower secondary education, these people are no longer in formal or informal education and receive no training of any kind, dropout is understood as the interruption of a study programme.The rate of ESL in this referential context is one of the highest in Europe, although these data have improved in recent years. According to Eurostat data (Eurostat, 2020), in 2019, the Spanish rate of ESL was of 17.2%, one of the highest rates of the European countries (while the Spanish had the lowest rate in the previous decade).

Our concern about this situation is driven by three primary detrimental effects: (a) its impact on society and the economy at large (Biemans, Mariën, Fleur, Beliaeva, & Harbers, 2019; European Commission, 2015; Gerhartz-Reiter, 2017), and (b) its negative impact on those who drop out and on these young people's education and work transitions (Azorín, 2019).

Young people's transitions are defined as processes extending into adulthood in which they define their identity, values, and personal trajectories through interaction with their context –families, schools, peers, and communities– (Reschly & Christenson, 2019) and milestones such as school completion or job placement (Moreno Mínguez, 2019). Successful transitions involve (a) adaptations of processes and states to educational/work settings (Archambault, Janosz, Goulet, Dupéré, & Gilbert-Blanchard, 2019; Fredricks, Ye, Wang, & Brauer, 2019) and (b) young people's active engagement and participation in these settings; these make possible the acquisition and development of needed skills, competencies, and values (Fredricks, Reschly, & Christenson, 2019).

However, many consequences of ESL high unemployment rates (MECD, 2015; Gerhartz-Reiter, 2017; Salvà-Mut, Thomás-Vanrell, & Quintana-Murci, 2016); high neither in employment, nor education and training (NEET) rates (Alegre, Casado, Sanz, & Todeschini, 2015; Salvà-Mut, Tugores-Ques, & Quintana-Murci, 2018); difficulty accessing job markets; poor self-esteem, poor emotional well-being, risk of health problems and psychological distress (Archambault et al., 2019; Gerhartz-Reiter, 2017; Serrano, Soler, & Hernández, 2013); risk of social exclusion (Cedefop, 2016; European Commission, 2015; Gerhartz-Reiter, 2017; Moreno Mínguez, 2019) all impact negatively on young people's educational and transitional processes (preventing their active engagement and participation in educational and work settings).

Student engagement is a multidimensional construct and malleable process that includes three distinct yet interrelated dimensions that evolve over time: (1) *behavioural* dimension, which focuses on students' participation in education; (2) *emotional* dimension, which focuses on students' emotional reactions to teachers, peers, and school; (3) *cognitive* dimension, which focuses on students' educational and academic expectations (Archambault et al. 2019; Fredricks, Reschly, & Christenson, 2019; Ryan, North, & Ferguson, 2019).

Each of these dimensions identifies factors that play a significant role in young people's transitions (Taylor & Parsons, 2011; Trowler, 2010; Veiga et al., 2012; Willms, 2003): involvement in learning, attendance, participation in school-related activities, students' positive or negative reactions to class and school, relationships with teachers, peers, family and school, self-regulated learing, self-perception, etc. This set of aspects can serve as a potential theoretical framework for the current investigation, enabling a better understanding of how dropout profiles

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impact upon unqualified young people's transitions into the workforce and society in general. This consideration is salient because of its potential to address problems related to dropout and completion, lack of interest and motivation among students, emotional well-being, and students' short and long-term outcomes, to name a few (Fredricks, Reschly, & Christenson, 2019; Reschly & Christenson, 2019).

Within student engagement theory, disengagement (understood as 'more than just the absence of engagement but also the presence of maladaptative processes and states'; Fredricks et al., 2019, p. 32) brings us closer to problems related to student dropout. Knowing how young people report disengagement along the three dimensions of the phenomenon can help predict their risk of dropping out and, further, identify which difficulties they encounter in arriving at successful educational and transitional processes (that some studies link, mainly, to participation, adaptation, and decision-making processes (Archambault et al., 2019; Fredricks, Reschly, & Christenson, 2019; Fredricks et al., 2019), all crucial components in transitions).

Fredricks et al. (2019) identified three profiles of disengaged students: (1) emotionally disengaged students, (2) behaviourally disengaged students, and (3) cognitively and emotionally disengaged students. Each one of these profiles identifies student-related factors. The first identifies bored students, who are not interesting in learning and have unsupportive relationships due to their unfavourable mental health status (higher psychological distress, as exhibited in emotions such as sadness, anxiety, frustation, etc.). Therefore, emotionally disengaged students tend to experience difficulty developing connections with the adults and peers at their schools (leading them to problems establishing relationships, adapting to learning environments and making appropriate educational decisions). The second detects students' disruptive behaviours, poor motivation, and interpersonal lack of connection. Therefore, behaviourally disengaged students tend to have difficulties paying attention and attending school consistently. They may also exhibit disruptive behaviour that often is coupled with minimal participation in and lack of identification with/valuing of the school culture. This goes hand-in-hand with difficulties, in general, adaptating to one's learning environment. The last one detects students characterised by the same profile of emotionally disengaged person, low academic achievement and low educational aspirations that increase one's risk of dropping out.

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In these profiles, disengagement takes many forms (lack of participation, poor motivation and lack of effort, disruptive behaviours, disaffection, withdrawal, academic failure, etc.) that impact on young people's educational and future work transitions. But it is worth highlighting, as Fredricks, Reschly, and Christenson (2019, p. 3) suggest, how demographic variables (e.g. gender, age, socioeconomic status, economic level, ethnicity or immigrant status) influence these disengaged profiles; in so doing, they provide insight into students' risk status. These, largely, tend to relate disengagement to males, youth from immigrant status, and youth from lower socioeconomic levels. Along the same lines, other studies (Moreno Mínguez, 2019) have underscored how these sociodemographic variables, which determine young people's personal and familial situations, impact the youngsters' educational and transitional processes (that are marked with failed transitions such as dropout and/or unemployment).

This theoretical perspective of student engagement, and especially these disengagement student profiles, allow us to describe young people's profile of this work and analyse the multiple factors that can be involved in and may be determinative of their educational and transitional processes.

Students of this work are unqualified young persons who are enrolled in the Catalan basic VET programmes – named PFI[2] – and who are characterised as being students who have dropped out of school. These students' profiles are described within the framework of the different studies and research as a heterogeneous group that is characterized by low educational engagement and, in particular, by behaviourally disengaged profiles. The main reasons argued related to students' previous negative educational experiences – mainly in compulsory secondary education (ESO) – as well as their poor academic performance as a consequence of their discipline problems, lack of study habits, or lack of motivation, to name a few (Olmos, 2014; Olmos & Mas, 2013, 2017; Ritacco & Amores, 2016). These factors lead to low self-esteem, a negative concept of 'self', and/or low achievement expectations among young people, as well as their rejection of the educational system and

(2) PFI programmes are non-compulsory and non-formal educational programmes that are regulated by the Educational Department of the Catalan government, which are addressed to young people aged 16 to 21 who do not successfully complete compulsory secondary education (ESO) (Generalitat de Catalunya, 2014, 2015, 2017). Nevetheless, since the implementation of LOMCE the current Spanish Educational Law that runs since 2014-2015 academic year, this basic vocational path was introduced and opened to ESO students aged 15 years and above, in an extraordinary manner (LOMCE, 2013).

institutions (which make them feel like failures; González & Porto, 2013). Nevertheless, these studies fail to address sociodemographic factors such as gender and, age. Indeed, only Alegre et al. (2015) identified the positive educational impact of these programmes on persons in the age range of 16-18 years, (or with immigrant status or low economic level, among others.). Most studies, as well, do not indicate if they are determinant factors regarding the students' previous or current education. Likewise, these studies do not determine if these factors impact young people's transitions to educational and work contexts. PFI programmes, which are characterised by their dual educational and work-related nature and by aiming to improve these young people's opportunities to access education and work, become a second chance for young people as the programmes focus on motivating youth to continue on VET pathways (Fernández-García, García Llamas, & García Pérez, 2019). Some studies in this field agree that these second-chance training programmes are significantly effective in re-engaging young people to follow formal VET pathways. However, the impact these programmes have on increasing young people's work prospects is somewhat limited (Alegre et al., 2015; Zacarés & Llinares, 2006).

Some studies (González & Porto, 2013; Olmos, 2014; Olmos & Mas, 2013, 2017; Prieto, 2015) agree that these basic VET programmes improve young people's perception of educational pathways and increase their willingness to reengage in intermediate VET programmes. However, these studies leave unanswered some basic questions regarding why such gains are not translated into a higher level of achievement in these formal VET pathways or why many of these young people remain unconvinced and disinterested; or why the impact on increasing these young people's labour prospects and work opportunities is limited.

Within this framework, working on VET to promote young people's educational pathways, and focusing attention on all those who do not achieve the minimum certification, is strategic for: (1) reducing the dropout rate and lack of training (ELET) among young people; (2) reaching higher educational levels (Biemans et al., 2019); (3) improving these young people's opportunities to access the job market.

Thus, considering the importance of developing research in accordance with this issue, this paper aims to reflect on how dropout profiles could impact the educational and transitional processes of unqualified young people enrolled in PFI programmes.

According to European Comission (2015, p. 6), ELET is most often the result of a combination of multiple factors: personal, social, economic, educational and family-related; these are heavily. As can be inferred, PFI youths' profiles cannot be understood outside a multidimensional perspective where multiple transitional factors are interrelated (Calero, Choi, & Waisgrais, 2010; Martínez & Molina, 2017; Olmos, 2014).

Reflecting on this, it is possible to hypothesise that these young people identify many of these factors, the combination of which has determined their previous and current educational experiences. Consequently, this may have a direct impact on their transitions. Nevertheless, some questions related to this hypothesis must be formulated: Which of these factors do these young people identify with? Do these factors really impact their previous and current educational experiences and transitions? Moreover, if that is the case, what impact do these factors have?

To this end, student engagement theory and its related disengagement profiles provide multiple variables, factors and indicators related to young people's personal background, academic results and schooling paths. These lead the description and analysis of how dropout profiles and their related factors, may impact young people's choices and transitions.

Methodology

This work is approached from the quantitative perspective of the research of which it is a part, which responds to a mixed methodological perspective that includes elements of both the quantitative and qualitative approach.

It shows the results of the descriptive variables of the PFI student profile, which are statistically analysed, within the multidimensional construct of student engagement.

After a first description of PFI student profiles, there will be an analysis that considers sociodemographic and educational factors, in combination with the variables of the three dimensions of student engagement mentioned above, as determining factors.

Sample

The sample was selected according to a probabilistic calculation of informed data on the total number of PFI available places for the 2014–2015 academic year and according to a representative sample at 95% confidence and sampling error of 5%. The study was integrated by 277 youths who were involved in some of the 24 PFI programmes. These programmes were of different specialisations and professional families that ran in 14 centres of Barcelona and its surrounding area (Badalona, Sant Adrià del Besós, and Hospitalet de Llobregat), as Table 1 shows.

TABLE 1. Sample

City	Young people		Centres		PFI programmes	
	n	%	*n*	%	*n*	%
Barcelona city	143	51.6	6	42.9	13	54.2
Badalona	83	30	5	35.7	6	25
Hospitalet de Llobregat	39	14.1	2	14.3	4	16.6
Sant Adrià del Besós	12	4.3	1	7.1	1	4.2
Total	277	100	14	100	24	100

Source: Own elaboration

Instrument

A questionnaire, based on the multidimensional construct of student engagement, was designed as data collection technique.

The questionnaire had four dimensions. The first was the personal and educational dimension. This comprises personal, social, demographic, family and economic variables (age, gender, immigrant condition, family situation, health, economic and work situation, etc.) and academic variables linked to current studies, itineraries, and school biography – see rates of failing and repeating years, previous school situation, access paths to VET studies, reasons for the choice of studies, intention and reasons for dropping out, etc. The second was the behavioural engagement

dimension comprising the variables of discipline and school adhesion – disruptive behaviour patterns. The third dimension was emotional engagement comprising variables related to teachers, school, peer group and family suport. The fourth dimension was cognitive engagement, a factor comprised of variables related to control of schoolwork and future expectations. All these dimensions were analysed through 15 items that present different alternatives, and whose answers are based on a scale of 0 (totally disagree) to 3 (totally agree).

The questionnaire was subjected to external validation. Fourteen independent experts – 10 academics and 4 VET professionals – validated the relevance and pertinence of the questionnaire according to a scale of 1 (not relevant/not pertinent) to 4 (very relevant/very pertinent). Results were measured with a statistical mean and reliability analysis (Cronbach's alpha) showing both significant reliability ($\alpha = 0.86$) and significant mean of the relevance and pertinence of the items ($M = 3.7$).

Internal validation –internal consistency was measured with reliability analysis– showed a significant reliability ($\alpha = 0.89$).

The Ethic Committee of Research (CER) from the University of Illes Balears (UIB) authorised the questionnaire, ensuring compliance with the ethical principles of respect for human dignity, confidentiality, non-discrimination and proportionality between the risks and the expected benefits.

Procedure and analysis

After the authorisation and consent of the educational centres and families and/or tutors to underaged young people, the questionnaire was given to the sample.

The data were subjected to descriptive and inferential statistical exploitation. The descriptive analysis (means and frequencies) is of the most relevant indicators in each dimension of students' engagement. The inferential analysis (*independent sample t-Test* involves comparison and *Pearson correlation*) is between a group of variables that are thought to be relevant for understanding students' dropout profiles and transitions. These variables are related to *student engagement dimensions*, their sociodemographic reality (*gender, immigrant status* and *economic situation*) and education (*leaving intentions, failing and repeating years,* and *expectations*). Specifically, the inferential analysis focuses on: (1)

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engagement dimensions and young people's sociodemographic (*gender, immigrant condition* and *economical situation*) and educational (*leaving intentions*) variables; (2) leaving intentions variable and young people's sociodemographic (*gender, immigrant condition* and *economical situation*) and educational (*repetitions*) variables; (3) young people's expectations and their sociodemographic (*gender, immigrant condition* and *economical situation*) and educational (*leaving intentions*) variables.

Sample description

Males between 16 and 17 years of age were the most representative group of this study (77.8%). More than 50% were born in Catalonia (64.4%), 3.3% were born an other place of Spain and almost one-third (32.4%) were born abroad (19.1% come from Central and South America). 95.9% live with their parents and 98.1% claimed not to have children. Regarding their economic situation, 60% claimed not to have, or have had, difficulties making ends meet, while 20% claimed to have significant or extreme difficulties making ends meet. In general, young people of the sample claimed to have good health and wellness although it is worth noting that 18.3% claimed to have important health issues related to depression, eating disorders, etc.; 28.2% claimed to have addictions linked to gambling, drugs, or alcohol, to name a few.

The educational background of the sample shows that they are enrolled in their current VET studies for different reasons such as: *'because I like it'* (51%); *'it improves working conditions'*(14.4%); *'because of counsellor guidance'* (11%), or the fact of not being able to access other VET studies (9.5%). Another interesting variable of their educational background is their intention of leaving their current VET studies and the related reasons. Of the sample, 80.4% said they do not intend to leave although it is worth noting that 19.6% are thinking about it. The main reasons they give are personal (39.6%), many times related to their economic situation.

Lastly, focusing on their previous educational situation (as being another educational background variable), this shows a group of young people who were enrolled in ESO (82.1%), although no one did particulary well at this level. Likewise, these young people had many instances of failing and repeating years (26% in primary education and 85% in ESO), being suspended, and even being expelled from high school (57.9%).

Results

This section shows the results from both descriptive and inferential statistical analyses of the variables that are involved within this work.

Descriptive analysis of the student engagement dimensions

The behavioural engagement dimension focuses on the analysis of young people's school adhesion and behaviour. Regarding school adhesion (M = 1.92; SD = .406), the most relevant indicators are *'I like to go to high school'* (70.8% agree or totally agree) and *'Spending time to do homework'* (although 38.7% agree with this statement, 32.5% disagree). Regarding the behaviour variable (M = 2.30; SD = .252), results suggest the presence of disruptive behaviour such as '*annoying others in class on purpose'*, '*answering the teacher impolitely*', '*cheating in exams'* or *'missing classes without reason'*. 60% of young people are in total agreement with these items.

The emotional engagement dimension focuses on the relationship between young people and teachers (M = 2.20; SD = .49), educational centre (M = 2.17; SD = .50), peer groups (M = 2.180; SD = .50), and the support their families give them (M = 2.18; SD = .50). Results show that young people in general have a good perception of their relationships with their teachers and peers around 80% agree or totally agree. On the one hand, they highlight their teachers' interest, honesty, treatment and willingness to listen. On the other hand, they value the friendship and communication with their peers. Regarding the educational centre, around 80% of young people have a good perception of the security and rules established by their schools (the latter being perceived as fair, although 17.1% of the sample disagrees). Finally, regarding *family support*, between 40% and 50% perceive that their parents are interested in their studies and expect their children to continue studying, helping them when needed. Nevertheless, it is worth noting that between 12% and 13% disagree with their parents' support indicators.

The cognitive engagement dimension focuses on young people's control over their schoolwork (M = 2.19; SD = .43) and expectations (M = 2.14; SD = .54). Around 80% agree or totally agree with indicators linked

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to their future professional opportunities and their interest in continuing to study. In general, they have the perception that they are training in an occupation they like, and that their studies will help them in their future professional career athough they need to continue studying to achieve their goals.

Inferential analysis of student engagement dimensions

The mean comparison analysis and Pearson coefficient between the three dimensions of the students' engagement, and the sociodemographic (gender, immigrant condition and economical situation) and educational variables (leaving intentions), identify significant differences ($p < .05$) as well as a lineal association which is statistically significant in all the analysed variables, except for the economic situation ($p > .05$).

TABLE II. T-Test means comparison of student engagement dimensions

Dimensions / Variables		**Gender**			**Immigrant condition**			**Leaving intentions**		
		Mean Man	Mean Women	*Sig.*	Mean Yes	Mean No	*Sig.*	Mean Yes	Mean No	*Sig.*
Behavioural dimension	School adhesion	1.82	2.05	*.00*	1.99	1.83	*.00*	1.60	1.94	*.00*
	Discipline	2.25	2.35	*.01*	--	--	--	2.04	2.34	*.00*
Emotional dimension	Teachers relationship and centre	2.12	2.23	*.00*	--	--	--	2.02	2.19	*.00*
	Peer relationship	2.13	2.22	*.01*	2.08	2.18	*.00*	2.04	2.18	*.00*
	Family support	--	--	--	2.06	2.25	*.00*	2.07	2.21	*.00*
Cognitive dimension	Control over schoolwork	2.12	2.32	*.00*	--	--	--	2.01	2.20	*.00*
	Expectations	2.05	2.23	*.00*	--	--	--	1.97	2.13	*.00*

Source: Own elaboration

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As Table 2 shows, the *gender* variable identifies significant differences in all the indicators of the analysed dimensions, except for family support ($p > .05$). Females indicate a higher mean than males, which leads us to assume that the females of this study have better behavioural, emotional and cognitive engagement. Likewise, it is possible to identify a weak positive and significant correlation between gender and cognitive dimension (r = .12, $p = .05$).

Regarding *immigrant condition*, this variable identifies significant differences in the behavioural – school adhesion ($p = .00$) – and emotional – peer relationship and family support variables ($p = .00$) – dimensions. Immigrant condition identifies a higher mean in the school adhesion variable and a lower mean in peer relationship and family support. Pearson coefficient supports these results and shows weak positive and negative significant correlations between immigrant condition and the behavioural ($r = .12$, $p = .04$) and emotional ($r = -.18$, $p = .00$) dimensions.

The leaving intentions variable also identifies significant differences in all the analysed variables ($p = .00$). Young people who do not have leaving intentions identify a higher mean in all the variables and/or indicators. In this way, Pearson coefficient shows a weak positive and significant correlation between this variable and all the student engagement dimensions – behavioural ($r = .19$, $p = .00$), emotional ($r = .16$, $p = .02$) and cognitive ($r = .18$, $p = .00$).

Lastly, Pearson coefficient between students' engagement dimensions shows a moderate positive and significant correlation among them, as Table 3 shows.

TABLE III. Pearson correlation between student engagement dimensions

	Behavioural dimension	**Emotional dimension**	**Cognitive dimension**
Behavioural dimension	--	--	--
Emotional dimension	.31**	--	--
Cognitive dimension	.43**	.57**	--

Source: Own elaboration

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Inferential analysis of leaving intentions variable

The leaving intentions variable – understood as a key variable in young people's transitions because of the role that it plays in young people's decisions to remain on educational pathways – has also been compared with gender, immigrant condition, economic situation and being suspended or expelled from the school system.

Results show that gender (p = .02) and economic situation (p = .00) are the only factors that identify significant differences.

Related to the *gender* variable, males identify a higher mean (M = .82) than females (M = .75). That is to say, males show more leaving intentions. This result is in accordance with inferential results of the behavioural dimension – remember that women identifed better school adhesion and discipline than men –, and could support why leaving intentions are higher for males than for females.

Related to the *economic situation* variable, young people without economic difficulties identify a higher mean (M = .87) than all those who claim to have economic difficulties (M = .77). It could be presumable to think that young people who have economic difficulties really feel these basic VET programmes are a chance to improve their opportunities to gain access to the job market. This could explain their lower leaving intentions.

Likewise, the leaving intentions variable also correlates positive with the *number of* young people failing and repeating years *in ESO* and *Primary education* although repeating in the ESO variable is the only one that identifies a weak positive and significant correlation (r = .13; p = .04). That is to say, the probability of young people having intentions to leave school is directly proportional to the number of times these young people fail and have to repeat years in ESO – presumably, the higher the number of repeats, the higher the probability of having intentions to leave school.

Inferential analysis of young people's expectations

The *young people's expectations* variable has been compared with gender, immigrant condition and economic situation. Significant differences are identified in the immigrant condition and economic situation variables,

and significant and moderate correlations are identified between expectations and gender, and economic situation.

Regarding *immigrant condition*, there are significant differences in expectations related to current studies, which can be understood as the way for: (1) accessing a job that provides money to make a living (p = .05); (2) doing what the young person really wants (p = .01); (3) preparing the young person in a profession that s/he likes (p = .02). Non-immigrant young people identify a higher mean. Pearson coefficient between the immigrant condition and young people's expectations supports these results. Even though it does not show a significant correlation, it is worth noting that it is negative (-.03 < r < -.07).

Regarding the *gender* variable, this identifies a moderate positive and significant correlation on the '*Doing what I really want*' indicator (r = .14; p = .01). Although the mean comparison between this indicator and the gender variable is not significant, it is worth noting that females identify a higher mean (M = 2.25 for females and M = 1.97 for males).

The *Economic situation* variable identifies significant differences only in expectations related to current studies, which is understood as the way for accessing a job that provides money to earn a living (p = .00). Young people without economic difficulties identify a higher mean (M = 2.35, being M = 1.94 to people with economic difficulties). Likewise, Pearson's coefficient identifies moderate positive and significant correlation on the indicators *'Accessing a job that provides money to earn a living'* (r = -.12; p = .05) and on *'Dedicating myself to what I really want, I will have to continue training after ending these studies'* (r = -.12; p = .05).

Discussion

Our results present us with a group of young people whose profile is described from a multidimensional perspective which considers numerous dimensions, variables, and factors related to personal features, educational issues, family, social and economic context, behaviour, etc. These factors, as well as the descriptive and inferential analysis applied here, seek to provide a contextual framework to further strengthen our knowledge and understanding of VET dropout rate, and the reasons for dropping out. In this regard, some questions were formulated: Which of these factors do these young people identify with? Do these factors

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really impact their previous and current educational experiences and transitions? Moreover, if that is the case, what impact do these factors exert? Along this section, we are going to give an answer to these questions from theoretical framework of the student engagement.

Starting with the factors that these young people's dropout profiles identify, in accordance with different studies (Biemans et al., 2016; González & Porto, 2013; Olmos, 2014; Olmos & Mas, 2013, 2017; Ritacco & Amores, 2016), these youngsters are characterised by heterogeneous dropout profiles that identify educational risk factors. For instance, disruptive behaviour, lack of study habits, lack of interest and motivation for studying, a high rate of failing years and repeating, bad educational experiences, negative perception of education and educational environments, just to name a few. The results of our study identify many of these risk factors on young people that agree with the description of a behavioural disengaged student profile. Results for the behavioural engagement dimension support the description of a young person's dropout profile, which is characterised by unmotivation, interpersonaly disconnection, and disruptive behaviour in addition to other factors such as previous dropout pathways, leaving intentions, repeating grades, or being expelled from school. Hence, presumably, it is possible to assume the impact that a behavioural disengagement profile has on these young people's previous and current educational experiences and transitional processes. That is, it is possible to assume difficult adaptation on educational settings that could impact negatively on these young people's educational experiences and transitions since the moment that they could have difficulties in participating first in educational settings and later in work settings. According to Moreno Mínguez (2019, p. 99), this is an indicator of failed transition from education to work.

Despite these risk factors, based on the results of this study, these young people also identify positive factors that lead to changing educational conceptions and, presumably, to a positive impact on their current educational experiences and transitions, especially on their educational transitions.

The variables and factors that are involved in the different dimensions of the student engagement indicate how all of them, in correlation with other variables, can determine these young people's choices linked to their educational and labour transitions. Delving deeper into the analysis, pertaining to the engagement dimensions emphasise the

role PFI programmes play in changing young people's perceptions of educational environments. Despite their entry profile, these young people's perceptions become positive, becoming a good basis for their educational course. That is to say, it is possible to assume that factors involved in these engagement dimensions could be determinant in impacting positively on these young people's choices and, consequently, on their transitional processes.

This paper shows that, in general, within the framework of PFI programmes, young people like to go to these educational settings. They have a good perception of them and value in a positive way the supporting role that different educational agents (teachers, family and peers) play (González & Porto, 2013; Romero et al., 2012). These are relevant data, highlighting the influence these important contexts (family, school, and peers) have on these young people's engagement (Reschly & Christenson, 2019).

Likewise, they are motivated with respect to their current studies, seen as the way for them to improve their working conditions and job opportunities; further, they feel the need to continue to train in order to improve their working conditions and job opportunities. The role these factors play within these basic VET programmes could impact positively on youngsters' transitions, who improve their motivation, interest, involvement and personal commitment to their current studies and future expectations (Alegre et al., 2015; Azorín, 2019; Cedefop, 2016; Olmos & Mas, 2013, Prieto, 2015; Salvà-Mut, Quintana-Murci, & Desmarais, 2015).

Nevertheless, in line with other studies (Fredricks, Reschly, and Christenson, 2019; Moreno Mínguez, 2019), it is worth noting that some young people's profile factors, such as sociodemographic variables like gender, immigrant condition or economic status, become more significant in relation to these student engagement dimensions within the framework of the PFI programmes.

Based on the results of this study, gender could be a determinant success factor in young people's educational experiences and transitions. Females of this study were identified as having better motivation, interest, and expectations regarding their current studies and having fewer leaving intentions. This would seem to indicate that females show higher behavioural, emotional and cognitive engagement than males, who show more risk of disengagement, especially in both behavioural and cognitive dimensions. According to disengagement profiles, while

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females could have better educational experiences and transitions due to better engagement trajectories, males could tend to have worse outcomes due to the difficulties the behavioural and cognitive disengagement profile mean to educational and transitional processes.

The economic situation is another determinant factor. In this case, young people without economic difficulties are identified as having a better predisposition for continuing their training. They recognise that they are receiving basic VET and realise that this is not enough so they should continue their training. This factor could be determinant for them to go further in their studies. This new conception about their need to continue training could be an example of the positive impact of these basic VET programmes on these young people's future educational and labour expectations and, presumably, on their transitions (Azorín, 2019; Zacarés & Llinares, 2006).

However, young people that have economic difficulties, although identified as being better motivated and more interested in their current studies as a way of attaining a job that can provide resources to improve their economic situation, are also identified as having lower educational and job expectations. This fact could explain their lower intentions of leaving their current studies but could be determinant for their future choices. According to this, we could say that this young people identify a cognitively and emotionally disengagement profile.That is, although they look engaged, it could be possible they decide not to continue on educational pathways once they finish their current studies in order to gain access to the job market as soon as possible. Nevertheless, it is worth highlighting that these basic VET programmes provide a low professional qualification and the risk of them being employed as unqualified labour is higher (Cedefop, 2016). Consequently, it could mean worse job opportunities for these young people in the longer term, an indicator of a failed school-work transition (Moreno Mínguez, 2019). In many cases, the economic difficulties factor meets the immigrant status factor. In this study, young people's immigrant status identifies them as being better motivated and interested in their current studies but also indicates lower educational and job expectations, a lower perception of their family support and a higher perception of difficulties in their peer relationships. These are clear descriptors of cognitively and emotionally disengaged student profile, so it is possible to assume the difficulties that this disengagement profile entails to these young people's choices

and educational and transitional processes, highlighting the difficulties related to family support and peer relationships (which are two critical contexts of engagement that are directly related to emotional dimension; Cedefop, 2016; Reschly & Christenson, 2019; Ryan et al., 2019; Serrano et al., 2013).

Peer relationships contribute to young people's socialisation, social support and social status (Ryan et al., 2019), which are crucial to educational and transitional processes since contribute to defining young people's identity, values and personal trajectories (Reschly & Christenson, 2019). Difficult peer relationships that immigrant young people of this study identify could lead us to assume difficulties on their educational and transitional trajectories.

Likewise, a lack of family support impact negatively on young people's social-emotional well-being, which is also crucial to successful educational and transitional processes (Ryan et al., 2019). Within the framework of this study, lack of family support is related to critical r such as precarious family economic situation that, in many cases, determines young people's choices. In line with other studies like Cedefop (2016), the lack of family support for young people's current studies and educational pathways is due to facts such as parents' lack of knowledge of the opportunities that training offers their children and their poor economic capacity. They should also be aware of getting further in which forces many of these young people to leave their studies in order to contribute to the family economy, as some of young people of this study say.

Based on the analysis, reflection and discussion of the results from our study, it is possible to assume that all these young people's dropout profile factors impact their previous and current educational experiences; this could be determinant in their educational and transitional processes.

In line with authors such as Fredricks et al. (2019, p. 41) and Wang and Amemiya (2019, p. 169), using an engagement-disengagement approach contributes to work on students' engagement trajectories and, presumably, on their educational and transitional processes (since it allows us to know which difficulties are related to students' disengagement profiles). The present work contributes to this understanding. Its interest and potential are the achievement of our results which, from a multidimensional analysis, identifies a group of personal, academic, behavioural, relational, affective-emotional and cognitive factors which, combined, could become determinant for young people's choices within the framework

of basic VET programmes. This would allow us to establish a descriptive reference framework from which to continue working on increasing the knowledge and understanding of these young people's profiles.

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The chairs of the Pedagogy Section of the University of Madrid under Early Francoism

Las cátedras de la Sección de Pedagogía de la Universidad de Madrid bajo el primer franquismo

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Abstract

This article studies the competitive exams to the chairs of full professor in the Pedagogy Section of the University of Madrid convened in the first decade of Francoism, a central element in the reconstruction of Pedagogy as a disciplinary field after the radical rupture that the war supposed. The study is based on the files kept in the *Archivo General de la Administración* (AGA) in Alcalá de Henares. The methodology used follows the classic guidelines of historiographic work on archival sources. Its main contributions to the state of knowledge in the field are the detailed analysis of the process and the publication of hitherto unknown empirical data that are relevant to the general interpretation of the process of reconstruction of the discipline after the war. In this sense, it is worth highlighting as main conclusions the questioning of the usefulness in this case of the general framework of confrontation between Catholics and Falangists, the relativization of the omnipresent power of Víctor García Hoz illustrated by his inability to turn his main disciple Fernández Huerta into a professor and the weakness of the delimitation mechanisms of the discipline, since it depended for the provision of its chairs of professors from other areas whose disciples competed as a second option in the search for a position in the university. Finally, the article offers an unpublished analysis of the competitive exam which provided the first female professor at the Spanish university, María de los Ángeles

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Galino. In general, the article studies the complex alignments and oppositions, not always disciplinary, nor ideological of the academic communities under Franco in the specific case of the disciplinary field of Pedagogy.

Key words: Pedagogy, university, disciplinary field, disciplinary institutionalization, academic women and university.

Resumen

Este artículo estudia las oposiciones a cátedras de la Sección de Pedagogía de la Universidad de Madrid convocadas en la primera década del franquismo, un elemento central en la reconstrucción de la Pedagogía como campo disciplinar tras la radical ruptura que supuso la guerra. El estudio se basa en los expedientes de oposición conservados en Archivo General de la Administración de Alcalá de Henares (AGA). La metodología utilizada sigue las pautas clásicas del trabajo historiográfico sobre fuentes de archivo. Sus principales aportaciones al estado del conocimiento en su campo son el análisis detallado del proceso y la publicación de datos empíricos hasta ahora desconocidos que resultan relevantes para la interpretación general del proceso de reconstrucción del campo de disciplinar tras la guerra. En este sentido, cabe destacar como principales conclusiones el cuestionamiento de la utilidad del marco general de enfrentamiento entre católicos y falangistas en este caso, la relativización del poder omnímodo de Víctor García Hoz ilustrada por su incapacidad para convertir a su principal discípulo Fernández Huerta en catedrático y la debilidad de los mecanismos de delimitación de la disciplina, pues dependía para la provisión de sus cátedras de catedráticos de otras áreas cuyos discípulos competían como segunda opción a la búsqueda de una posición en la universidad. Finalmente, el artículo ofrece un análisis inédito de la oposición que proveyó la primera catedrática de la universidad española, María de los Ángeles Galino. En general, el artículo estudia los complejos alineamientos y oposiciones, no siempre disciplinares, ni ideológicos de las comunidades académicas bajo el franquismo en el caso concreto del campo disciplinar de la Pedagogía.

Palabras clave: Pedagogía, universidad, campo disciplinar, institucionalización disciplinar, mujer y universidad.

Franco's victory in the Spanish Civil War brought to an abrupt end the consolidation process of Pedagogy as an academic discipline, a process that had advanced over the first third of the twentieth century and culminated in the incorporation of Pedagogy sections into the universities of Madrid and Barcelona (Jover, 2019). The Pedagogy Section of the University of

Barcelona, whose entire staff had been exiled, was shut down, while that in Madrid was maintained although only as a program in extinction (Galino, 2005, pp. 18-19). The process of reconstructing the discipline in the university was begun in 1943 with the convocation for the chair of Superior Doctorate Pedagogy, a position charged with symbolism, as this had been the very first Pedagogy chair established in a Spanish university and had been held by the legendary pedagogue Cossío. Several months later, in August 1944, university studies in Pedagogy were restored (BOE, 4/8/1944) with the establishment of four chairs: General and Rational Pedagogy; Principles of Methodology and Didactics; History of Pedagogy and History of Spanish Pedagogy; and Experimental and Differential Pedagogy. All of these chairs needed to be filled, as the reorganization of the discipline did not contemplate the continuity of the chair of the only full professor from before the war: this was the chair of the Methodology of Economic and Social Sciences, held by Juan de Zaragüeta Bengoechea (Jover, Vilanou y Laudo, 2014).

This article contributes to our knowledge of this process of the reconstruction of Pedagogy by scrutinizing the competitive exams administered to the candidates for these chairs. The documentary grounding for this research consists of the files of these competitive examinations held in the Archivo General de la Administración, which include three types of documentation: documents involving the process of convocation and admission of candidates; the examination records themselves, made up of the successive minutes written up by the tribunal regarding candidates' exercises and written responses; and the memories and justification of merits provided by the winning candidate (the other candidates having reclaimed their documents). These files provide us with an extraordinarily rich source for examining the hermetic world of university alliances and enmities as well as offering us a first-hand account of contents, orientations, approaches and practices of the Pedagogy discipline. In this line we should mention a pioneering work authored by Fernando Gil, María del Mar del Pozo and Teresa Rabazas (2014) about the first two chairs, a study that has yet to be followed up upon. Ruben Pallol (2014) includes the first three chairs in his systematic overview of all post-war Philosophy chairs, albeit with a greater emphasis on ideological and political questions than on disciplinary ones. The current study, which adopts an institutional perspective of academic micro-politics, strives to avoid the general scheme of confrontation between

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Falangists and Catholics and to offer instead a viewpoint that stays closer to the sources and to how they portray the web of alliances and rivalries that marked the process.

The Chair of Superior Doctorate Pedagogy of Víctor García Hoz (1943-44)

In July of 1943 (BOE, 28/07/1943), a year before reinstating the Pedagogy Section, the ministry summoned the first post-war chair in the field, that of Superior Doctorate Pedagogy. The priest Manuel Barbado Viejo, director of the Pedagogy Institute San José de Calasanz of the Higher Council of Scientific Research (CSIC) was named president of the tribunal (BOE, 22/09/1943). The tribunal chairs were Pedro Font y Puig (professor of Psychology in Barcelona), Tomás Carreras Artau (professor of Ethics in Barcelona), Francisco Alcayde Vilar (professor of Fundamental Logic in Valencia) and Manuel Mindán Manero (teacher at the National Grammar School Ramiro de Maeztu and secretary of the Philosophy Institute Luis Vives of the CSIC), who acted as secretary. Juan Francisco Yela Utrilla (professor of Foundations of Philosophy and of History of Philosophical Systems in Madrid) substituted Tomás Carreras Artau, who renounced his designation alleging commitments as deputy mayor of Barcelona.

The two candidates for this chair, Víctor García Hoz and Anselmo Romero Marín, had obtained the only two degrees issued by the Pedagogy Section before the war (Expediente académico, 1936 and Expediente académico, 1941). They were also the first two PhDs of the post-war period, both of them having obtained their Doctorate under Zaragüeta (Universidad de Madrid, 1953), who nonetheless was not a member of the tribunal. Despite these coincidences in their trajectories, after the war the two candidates found themselves in markedly different positions of academic power. While García Hoz was secretary of the Pedagogy Institute of the CSIC, acting in effect as its director, Romero had been relegated to the post of teaching assistant in the university section that was on its way to extinction. In terms of academic production the difference between the two candidates was even greater. García Hoz was in the process of publishing a book based on his thesis and had presented a second manuscript, both to be published by the Pedagogy Institute; he had published several articles in the first two issues of the

Revista Española de Pedagogía, published by the same institute; and he had contributed three articles to the *Boletín de la Institución del Divino Maestro* as well as other written works. In contrast, Romero's work was limited to two articles prior to the war: a study about Rodrigo Sánchez de Arévalo published in *Las Ciencias* and another article in the *Revista de Pedagogía*. Interestingly, Romero chose to leave unmentioned a prior study published in *Cuadernos de la Facultad de Filosofía y Letras* about the pedagogical ideas of Cossío (Oposición, 1944).

It would seem, then, that García Hoz had everything in his favor. In addition to the superiority of his curriculum, he also enjoyed the favor of the tribunal, a fact evidenced by the most decisive intervention of the process, that is, the establishment of the contents for the fifth exercise, which was practical. The tribunal split this exercise into two parts: a commentary on a statistical study and a pedagogical research project of an experimental nature. That these were García Hoz's strong suits had been made clear with the third exercise, for which he had chosen a subject of factorial analysis, whereas Romero had opted for a topic that could not have been further from quantitativism: "An historical perspective of education as regards the subject".

For the commentary of the fifth exercise the tribunal chose a statistical chart from the article by Otto Klineberg "A study of psychological differences between racial and national groups in Europe" published in *Archives of Pyschology* in 1931. In making this choice, "the tribunal was serving it [to García Hoz] on a platter", in the words of Rubén Pallol (2014, p. 490); the context enabled the candidate to distance himself from philo-Nazi racism by stressing "the greater influence of civilization over race in the development of mental capacity". Notwithstanding this national-Catholic approach, the two candidates were not so very different, as Romero shared similar Catholic perspectives. The emphasis on their differences seems to stem from a temptation to interpret the confrontation of the two candidates as representative of the broader struggle between Catholics and Falangists for university chairs (Pallol, 2014, pp. 514 y 533). What the tribunal was really doing in resorting to this chart was offering García Hoz the chance to exhibit his superior statistical skills, honed over years of working in an area in which Romero's experience was much more limited. The second part of this practical exercise, the elaboration of an experimental pedagogical research project, also played to the strengths of García Hoz, who was specialized precisely in this field of the discipline.

The ideological-political coincidence between García Hoz and Romero was made evident when, for the sixth exercise – this one chosen by lottery – a topic proposed by the Falangist Yela Utrilla came up. "Critique of a pedagogy based on a liberal concept of life" was a delicate subject, to say the least, requiring an ideological stance on the candidates' part. Both were able to present their dissertations in a strictly academic tone, avoiding the anti-liberal, defamatory rhetoric so common in public speech at the time. The two candidates also adopted a similar approach to the exercises, which consisted of an initial exposition of liberal principles followed by a second part with a critique. García Hoz (1944) edified his exercise on the idea that the premise of liberalism was opposition to preexisting authority and that subsequently, liberalism in the field of pedagogy took the form of two principles: the negation of authority to teach, and students' learning by themselves through discovery. He saw this approach as having originated in Rousseau and subsequently been elaborated on by the Progressive Education, with the contribution of certain other precedents such as Tolstoi. García Hoz also expounded upon the defense of religious neutrality and education for democracy before concluding that liberal approaches to education all shared "a failure to acknowledge the authority of the teacher in the phenomenon of education". In his critique, he claimed that liberal indifference towards "possible legal forms of national life, under the eternal pretext of scrupulous respect for individual conscience", represented "a betrayal of the community in which one lived and which afforded people the possibility of a civilized life". In defending the importance of the teacher's nationalist commitment, García Hoz resorted to Kerschensteiner: "the teacher who does not feel the soul of his country is a lost cause for the national community". His conclusion was that liberal pedagogy was incapable of defining the teacher's role.

Romero (1944) tackled this exercise by starting off with a double characterization of liberalism. In the ontological realm, the underlying premise of liberalism would be the belief in an individual who comes before society, which emerges as a mere aggregation of these preexisting individuals. Axiologically, liberalism assumes the natural goodness and equality defended by Rousseau. In the face of these principles, Romero defends the bonds among these individuals, which, while serving to strengthen society, also lead to a questioning of individualism and reveal the falseness of the idea of equality. Romero saves his most vehement

criticism for the idea of the natural goodness of man, asserting that man "went astray and committed the so-called original sin, the unfortunate inheritance that the rest of us are born with". He adds that "man is born with the blemish of sin; the treacheries of his passions will manifest themselves all too soon". This line of argument, very closely aligned with national-Catholic discourse, led to a conclusion in which Romero offers a scholastic approach contrary to the academic freedom: "There cannot and should not be more freedom than that needed to do good and to teach truth".

In light of these attitudes, it is hard to justify the accepted image of a Fascist Romero versus a Catholic García Hoz. To the contrary, Romero's discourse in this case is far more prototypically national-Catholic than is that of García Hoz. In fact, the conclusion of the exercise is practically a literal quote of the conception of academic freedom espoused by education minister Ibáñez Martin (Canales, 2015, pp. 94-5). The exercise elaborated by García Hoz, more disciplinary in general, included quotes of foreign authors, whereas Romero did not offer a single citation in his exercise. The references used by García Hoz, in addition to that mentioned above by the German social pedagogue Kerchensteiner, were to Harold Dent and his book *A new order in English education* – published scarcely a year before and key in the democratization of education in England – and to the German spiritualist-culturalist pedagogue Wilhelm Flitner.

In the end it was García Hoz who obtained the five votes of the tribunal and who in 1944 (BOE, 14/3/1944), at the age of 33, became the successor to Cossío in the chair of Superior Pedagogy as well as the undisputed leader of Francoist pedagogy. Romero would have to wait until 1949.

The General and Rational Pedagogy chair of Anselmo Romero Marín (1948-49)

The second chair, that of General Pedagogy and Rational Pedagogy, was not convened until 1948 (BOE, 7/2/1948). Although he no longer belonged to the Pedagogy Section, Juan Zaragüeta was chosen to preside the tribunal. The tribunal chairs were Tomás Carreras Artau (Ethics professor in Barcelona), Víctor García Hoz (Superior Pedagogy professor in Madrid), Leopoldo E. Palacios Rodríguez (Logic professor in Madrid)

and Manuel Ferrandis Torres (professor of General History of Culture in Madrid). All of the members of the tribunal for this convocation were university professors, with four out of the five holding positions in Madrid (BOE, 25/11/1948).

Anselmo Romero Marín was the sole candidate. Given the lack of any competitor and the presidency of Zaragüeta – of whom Romero was considered the most loyal disciple – (Jover et ál, 2014, p. 338), the convocation of this public examination can be seen as a pure formality, a way of compensating the candidate for the prior postponement of his incorporation into the Section and the years of delay. However, Romero's promotion was not quite as automatic as could have been expected. José Artigas Ramírez, teacher at the Hispanic-Moroccan Grammar School of Ceuta, presented an appeal when the exercises were about to begin, requesting a new period of admission for candidates, alleging that more than a year had gone by since the official convocation of the examination (Expediente de oposición, 1949). The appeal was rejected.

By the time the exercises began in March 1949, the academic curriculum of Anselmo Romero had grown considerably in comparison to that which he had presented five years earlier. As a national primary teacher since 1928, in a position obtained by public examination, he had received a grant to study Pedagogy, the specialization for which he had obtained his graduate degree in June 1936. The outbreak of the war caught him as he was participating in the summer sessions of the International University of Santander, from where he was evacuated to France. Instead of returning to the Republican-controlled area, Romero went to the area controlled by the nationalists, presenting himself before the rectory of Zaragoza, which assigned him a position at the grammar school of Molina de Aragón. He participated as a specialist of pedagogy in a teacher training course given in August of 1937 before enlisting in the Francoist army (Expediente de depuración, 1940). At the war's conclusion Romero secured a position, by public examination, as translator for the School of Orphans of the Navy in September of 1943. He also worked as teacher of Pedagogy in the National School of Instructors of the official party from its founding in 1942. Romero (1949) balanced this professional activity with classes in the Pedagogy Section which, starting in September 1939, he gave under different administrative categories. As of 1947 Romero had been assistant teacher to the chair for which he was now opting.

The first part of the practical exercise dealt with the analysis of a text by Dewey, drawn by a lottery that included another text by Quintiliano. The second part consisted of a critique of the lesson "Mallorca, golden island", published as a practical lesson in *Escuela Española* (Expediente de oposición, 1949, Acta 22). In his analysis of Dewey, Romero (1949b) classified the American author as a *socialist*, in that his goal was to completely socialize education. In response to this aim, the candidate took the terms of his critique of liberal individualism that he had espoused in the examination five years prior and inverted them, offering up a rousing defense of the individual's place in society: "in [Dewey's] socialist conception, the individual is absorbed by society, negated by it; he ignores the fact that the social life has no end in itself and that it is meant to be at the service of the individual, in whom resides the preeminent value of the personality". He also criticizes Dewey's reduction of social factors to that of work and his failure to take into account "other aspects which, more than labor operations, constitute the most intimate and profound part of our individual life and which also have social repercussions". Romero concludes with his most fundamental criticism of Dewey, this one from a religious perspective: "finally, owing to his insertion in what we could call an almost biological relativism, he ignores the transcendent value of truth and of its permanence above and beyond individuals and historical changes in peoples and societies".

The last exercise, chosen by lottery, asked the candidate to expound on "the concept and the domain of physical education as opposed to hygienic and therapeutic treatment", a topic that offered the possibility of presenting physical education as a specific pedagogical subject distinct from the field of medicine. However, Romero (1949c), instead of responding to the disciplinary question that had been posed, launched into a philosophical-theological discourse on the relationship between the body and the soul, concluding with an entreaty to not reduce man to "the culmination of a zoological scale".

As it turned out, this religious approach distinguishing flesh from spirit had informed the research work presented for the chair, titled *Nature and Education* (Gil et ál, 2014, pp.114-9). With a mere two pages of bibliography, Romero (1949d, p. 262) went on to develop, in nearly three hundred pages, the idea that if man is reduced to his *nature*, he will be incapable of achieving a life of fulfilment and perfection. In this sense he defended the notion that the supreme educational ideal cannot

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be reduced to "an aim that is merely naturalist", but that "it must be greater, transcendental, supernatural." Here he invoked "the pedagogical [action] of Grace". From such a perspective, his conclusion could be none other than the negation of Pedagogy as a disciplinary field and its subordination to religion: "There is no Pedagogy deserving of the name whose method is not the path to Christ, whose teachings are not the truths revealed in Scripture, and which does not prepare its pupils for a Christian life" (p. 268).

In Romero's case, this negation of Pedagogy as an independent disciplinary field distinct from religion coincided with his limited mastery of the discipline itself, as shown by his exercise on Physical Education. It was this, and not his alleged Falangist militancy, that distinguished him from García Hoz, who was able to find a balance between his Catholic convictions and the demands of the discipline. In any case, these differences never came to light due to García Hoz's absence from the fourth exercise owing to illness. The tribunal decided to continue with the examination (Expediente de oposición, 1949, Acta 22) and the two final exercises were certified without him. The four tribunal members then voted unanimously in favor of Romero (Expediente de oposición, 1949, Acta 25).

The frustrated Principles of Methodology and Didactics chair of Fernández Huertas (1950-51)

A few months after Romero secured his chair a convocation was held for the third chair of the section, namely, that of Principles of Methodology and Didactics (BOE, 30/12/ 1949). The chair of Psychology in Barcelona Pedro Font y Puig was named President of the tribunal, while the tribunal chairs were Víctor García Hoz and Anselmo Romero Marín (the two chairs of the Pedagogy Section), Ángel González Álvarez (Metaphysics chair in Murcia) and Ramón Roquer Vilarrasa (priest and teacher at the Maragall grammar school of Barcelona) (BOE, 6/4/1951).

The presumptive candidates were two young pedagogues who had recently earned their doctorates in the didactics of writing and who, having received their training in the Pedagogy Institute of the CSIC, now worked as assistant teachers in the university Section: Esteban Villarejo Mínguez, whose doctorate was supervised by Zaragüeta in 1945, and

José Fernández Huerta, who as the first doctoral student supervised by García Hoz, had obtained his PhD in March 1947. Although only six years younger than García Hoz and Villarejo, Fernández Huerta represented a generational turnover, being the first researcher to receive his degree directly in Pedagogy, without previously going through teacher training. He also had a solid research curriculum, having published two books and more than ten articles. All of these credentials seemed to make Fernández Huerta the natural candidate for the chair, pointing the way for García Hoz to control two of the four chairs of the Section and to consolidate his line of experimental pedagogy (Canales, 2019).

However, events did not play out as expected. To begin with, there turned out to be four candidates (BOE, 14 May 1950). While the 25-year-old philosopher Gustavo Bueno, at the time a grammar school teacher in Salamanca, did not seem to represent a serious challenge, the same could not be said of the Falangist Adolfo Muñoz Alonso, professor of Foundations of Philosophy in Murcia, who was seeking to be transferred to Madrid (Pallol, 2014, pp. 511-512). There were further problems when in January of 1951 the deadline for the admission of candidates had to be extended for two months, as more than a year had gone by since the original convocation without a proper verification of the exercises (BOE 24 January, 1951). It was during this extension that Félix García Blázquez, secondary school teacher and member of the original nucleus of the Fascist JONS, became the fifth candidate (BOE, 18/5/1951). García Blázquez had twice competed unsuccessfully for chairs in Philosophy (Pallol, 2014, pp. 484 y 516).

In fact, this entire public examination process for a chair in Didactics was taking place at the same time as two convocations for chairs in Philosophy, with some candidates involved in both, a fact that leads us to suspect the possibility of their interfering with each other. Given that Muñoz was considerably keener about the chair in Philosophy than that of Didactics, it does not seem at all improbable that the delay in the exercises may have been due to a wish to see if this ill-suited competitor obtained his preferred chair and withdrew.

None of the three candidates opting for Philosophy attained their desired chair, thus intensifying the pressure from Muñoz, who on the heels of his failure in Philosophy was pinning all of his hopes for a transfer to Madrid on obtaining the Didactics chair. Nor did the changes in the tribunal seem to favor the two original candidates from the Section.

The tribunal's lead chair, Ángel González, pulled out and was replaced by Francisco Alcayde (professor of Foundations of the Philosophy and History of Philosophical Systems in Valencia) (Pallol, 2014, p. 533). The withdrawal of the initial chair, who served on the faculty with Muñoz in Murcia, could be seen as his way of refusing to help his colleague in his ambition to win a transfer to Madrid. In this way, the tribunal rid itself of a member who was presumably not favorable to Muñoz, but the real effect of his withdrawal was the incorporation of Alcayde, who ended up voting for Muñoz. The withdrawal after the exercises had begun of the priest Ramón Roquer, due to renal illness, (Puigvert, 1951), reduced the tribunal to four members while depriving García Hoz of a probable ally in favor of Fernández Huerta or, at the very least, less sympathetic towards the Falangist Muñoz.

According to Rubén Pallol (2014, p. 534), Fernández Huerta demonstrated a superiority over his rivals with greater technical mastery, an advanced statistical knowledge and the use of a specialized bibliography; in a word, by his prowess in the disciplinary field. Yet this author seems to ignore the similar formation and skills of Esteban Villarejo. Either way, neither of the two won the vote. Fernández Huerta received the vote of the supervisor of his thesis, García Hoz, while Estaban Villarejo received that of the president of the tribunal, Puig y Font. The other two votes went to Muñoz.

The vote cast by Alcayde was clearly a corporative one, meant to stress Muñoz's position as full professor, one holding his same chair in Murcia. While Alcayde acknowledged "the evident, formidable bibliographical erudition concerning works from the world over" in Fernández Huerta as well as the way in which Villarejo "had applied with his students the most advanced methods invented by authors of great worth", he explained his vote for Muñoz with a vacuous, *ad hoc* justification: "he is able to group together in great pedagogical syntheses all didactic applications, conferring unity to an ever-growing and diverse number of procedures proposed by authors for teaching" (Alcayde, 1951).

Pedro Font also acknowledged the disciplinary competence of Fernández and Villarejo. Of the former, he praised his "assiduous dedication and competence in research" and his "great mastery of mathematical terms", while of the latter – for whom he voted – he commended "his outstanding knowledge of pedagogical technique". As for Muñoz, Pedro Font dedicated to his interventions some vague, lengthy considerations of a philosophical nature (Font, 1951).

García Hoz was far more blunt, calling out Muñoz's ignorance of the field and asserting that "his work is only indirectly related to the chair for which he is competing, which is neither that of Logic or Methodology of Science". He was even harsher in his appraisal of the research project presented by Muñoz, calling it "a contrived work which (...) does not even demonstrate the identity between mathematics and logic", a scathing critique that was in effect calling into question the candidate's competence in his own field of specialization (García, 1951).

However, the truly significant vote in this examination was that of Romero, the recently minted PhD, who, instead of prioritizing the disciplinary background of the candidates for the new chair in Pedagogy, downplayed this aspect. He commented that Fernández Huerta "is lacking a proper philosophical training as well as the necessary depth of pedagogical interpretation of numerical results", while in his view Villarejo "lacks the necessary philosophical training that serves as a basis for the many problems that arise in Methodology and Didactics" (Romero, 1951). In voting for Muñoz – of whom he highlights "his profound philosophical vocation" – Romero was not only "getting even" with the experimental pedagogy that García Hoz had been promoting from his privileged position at the Pedagogy Institute of the CSIC and as the first full professor in the field; he was reaffirming his negation, which he demonstrated in the examination exercise for his position, of the disciplinary autonomy of Pedagogy with respect to Philosophy and Religion.

Adolfo Muñoz did not win the chair, as he failed to obtain the three necessary votes, but his participation had a severe, frustrating effect on the career of Fernández Huerta, who would have to wait ten years before obtaining a chair in Barcelona. The line of experimental investigation being carried out by García Hoz also took a notable hit. This setback gives some perspective to the accepted notion that García Hoz enjoyed near-unfettered power, as the chair in Didactics remained unfilled for nearly the entire decade before it was occupied in 1958 by Arsenio Pacios López, a scholar with the philosophical training so dear to Romero. The entire process highlights the complex balance of powers that, even under a dictatorship, continued to characterize the university domain and to frustrate García Hoz's ambition for complete power in the Pedagogy Section of the University of Madrid.

The History of Pedagogy and History of Spanish Pedagogy chair of María Ángeles Galino (1950-54)

The fourth chair of the Section, that of History of Pedagogy and History of Spanish Pedagogy, was announced in January of 1950, just three weeks after that of Didactics. (BOE, 20/01/1950). However, due to an endless series of bureaucratic mishaps, the exercises were not undertaken until December of 1953, near four years after the original convocation.

The first candidates admitted in May 1950 were María Ángeles Galino Carrillo, Evelio Teijón Laso, Emilio Hernández Rodríguez, José Perdomo García and Cristino A. Floriano Cumbreño (BOE, 13/05/1950). Evelio Teijón was a teacher of history at the grammar school Cisneros and assistant at the university. José Perdomo García, who at the time was also competing for a chair in Philosophy, had read his thesis *The theory of knowledge in Pascal* in 1948 under the supervision of Zaragüeta, had been an assistant in Metaphysics since 1944 and had collaborated with Calvo Serer in *Arbor* (Díaz, 2008, p. 547). Emilio Hernández Rodríguez had read his thesis on Pedro López de Montoya in 1945. Although his supervisor had been Cándido González Palencia, professor of Spanish Arabic Literature, the thesis was registered in the Pedagogy Section (Universidad de Madrid, 1953), making Hernández Rodríguez the third Doctor of Pedagogy in the Spanish University, after García Hoz and Romero. During this time Hernández had received a scholarship from the Pedagogy Institute of the CSIC, where he became secretary in 1948. In October 1949 he resigned after a confrontation with García Hoz, whom he had tried unsuccessfully to recuse from a tribunal in favor of Zaragüeta, "a fair and neutral judge, an upstanding and incorruptible priest" (Hernández, 1951). Cristino A. Floriano Cumbreño had spent most of his professional career in a teacher training school, where he began in the mid-1920s, having also been involved with archeological excavations. In 1944 he had won a chair in Paleography and Diplomacy in Oviedo, and after the civil war he had been active in the realm of pedagogy, publishing several disciplinary manuals. And finally there was Ángeles Galino Carrillo, who was viewed as the favorite, as she had been teaching the subjects of the chair as assistant teacher since 1946.

At the end of January of the following year, a full year having gone by without the establishment of the exercises, a new admission deadline for candidates was set. Two new candidates were incorporated: Constantino

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Láscaris Comneno Micolaw and José Artigas Ramírez (BOE, 28/1/1951 y BOE, 9/6/1951). José Artigas, who had previously attempted to compete for Romero's chair after a similar deadline extension, was a professor at the Hispanic-Moroccan grammar school of Ceuta and, as the seventh of fourteen Doctors supervised by Francisco Yela Utrilla during the 1940s, had defended a thesis on *The notion of philosophy in Séneca* in 1947. Constantino Láscaris Comneno was one of another group of young post-war Doctors of Philosophy. His thesis, supervised by Santiago Montero Díaz and read in November of 1946, was titled *Quevedo's philosophical thought*. After failing to secure a chair in the convocations of these months, Comneno went on to pursue a professional career in Costa Rica beginning in 1956.

Neither was this second list of candidates from June 1951 definitive. In December of the same year a third deadline was extended, this time in response to a new regulation concerning the composition of tribunals, which we will explain below. As a result, the existing tribunal was dissolved and admission to the examination was reopened (BOE, 14/12/1951). As no new candidates came forth during this third period of admission, in April 1952 the seven candidates named in the previous period were confirmed (BOE, 3/4/1952). However, the bureaucratic entanglements were far from over, and in March 1953 a fourth period of admission was opened due to the fact that a year had passed since the convocation without the exercises having got under way (BOE; 1/3/1953).

During this fourth admission deadline, which would prove definitive, in addition to the seven previously confirmed candidates two new contenders came forward: Fermín de Urmeneta y Cervera, who had been excluded from the second admission period, and Benito-Salvador López Herrera (BOE, 25/7/1953). Fermín de Urmeneta was a young Doctor – just 25 – in possession of a double doctorate in Law and Philosophy. Of the two theses he had defended in 1947, both on Luis Vives, one had been under the supervision of García Hoz. Since the time of his doctorate he had worked as assistant to the chair of Superior Psychology in Barcelona. After competing unsuccessfully for several positions he had finally sought a post as grammar school teacher (Bueno, 2020). Salvador López Herrera, a historian specialized in the history of the Canary Islands, competed for several chairs over the course of the decade before eventually finding a way to balance secondary education teaching with the university.

But the bureaucratic troubles went beyond the admission of candidates, as the designation of a tribunal brought its own set of problems. The first tribunal for the chair was selected in July 1951 (BOE, 27/7/1951), but in September of the same year the ministry of Ruiz Giménez approved a series of new rules regarding the composition of tribunals (BOE, 19/9/1951) which led to the annulment of the first tribunal, along with those of 21 other university chairs (BOE 14/12/1951). It was a year and a half before the new designation was made effective in June of 1953, by which time the fourth period of admission had concluded (BOE, 24/6/1953). The bishop of Segovia, Daniel Llorente Federico, was chosen to preside this tribunal, whose other members were the two Pedagogy chairs, Víctor García Hoz and Anselmo Romero Martín, Juan Zaragüeta Bengoechea, who by this time had retired, and the chair of Foundations of Philosophy in Madrid, Antonio Millán Puelles. At some point during the fall the bishop of Segovia withdrew and was replaced by José Corts y Grau (chair of Philosophy of Law and Rector in Valencia) as tribunal president (Expediente de oposición, 1953, Acta 1).

With the never-ending bureaucracy seemingly concluded, the exercises were verified between the last week of November and the middle of December of 1953...nearly four years after the initial convocation. When four of the nine candidates did not show up, the field of competitors was reduced to Galino, Hernández, Láscaris, Artigas and Urmeneta (Expediente de oposición, 1953, Acta 3). Hernández was later excluded when he failed to appear for the third exercise (Expediente de oposición, 1953, Actas 19 y 20), and Urmeneta was suspended in the fourth exercise. This left Galino, who was nearing the age of forty, and the two young scholars, Artigas and Láscaris, who had only recently turned thirty.

The tribunal decided that the fifth exercise, a practical one, consist of a text analysis. From among Quintiliano, San Agustín, Pestalozzi, Dewey and Lombardo-Radice, an extract of *The Confessions* of Saint Augustine was chosen (Expediente de oposición, 1953, Actas 2, 24 y 35). After the three candidates completed this exercise (Expediente de oposición, 1953, Acta 26) they undertook the final analysis, this one on "Platonism throughout pedagogy" (Expediente de oposición, 1953, Acta 27).

With the exercises completed, the time for voting had arrived. The three chairs of the Pedagogy Section voted for Galino. While García Hoz acknowledged Artigas' brilliant skills as a writer, he criticized the candidate's "excessive limitation to a certain type of source". As for Láscaris,

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García Hoz found fault in his excessively philosophical approach (García, 1953). Paradoxically, Romero, who had defended the opposite position in the examination of Fernández Huerta, now leveled this same critique at Artigas' performance; of Láscaris, Romero pointed to his limited research expertise in comparison to Galino. Meanwhile, Zaragüeta (1953) censured the fact that Artigas failed to distinguish "the moral and religious from that which is specifically pedagogical in ascetics".

Neither the president nor the secretary of the tribunal concurred. While acknowledging Galino's broad mastery of the subject, they both pointed to the contrast between the brilliance and solidity shown by the two male candidates and the mediocrity of Galino. Millán Puelles (1953) held that "Láscaris was brilliant" in his commentary on Saint Augustine, whereas "Dr. Galino was merely acceptable". The tribunal president goes into considerable detail in his comparisons:

> In my opinion, the situation after the fourth exercise was as follows: a performance by Ms. Galino that was mediocre, though confident; a greater depth and brilliance –albeit with undeniable imprecisions– shown by Mr. Artigas; and a greater solidity demonstrated by Mr. Láscaris, whose interventions have steadily improved.
> In the following exercises there was to my mind a noticeable decline in Ms. Galino with respect to her rivals. However, it is not easy to discern between these two; while Mr. Artigas continues to display his brilliance, richness of suggestion and occasional glibness, the expositional rigor of Mr. Láscaris is ever-more evident (Corts, 1953).

His overall evaluation of the three candidates was thus:

1. A discrete level shown by all three candidates.
2. A greater specialization and commitment to the discipline shown by Ms. Galino; but with serious shortcomings in her philosophical formation and her relevant bibliography, notwithstanding the imposing appearance of the bibliographical trappings.
3. A higher overall standard shown by Mr. Láscaris, although his pedagogical formation seems more deficient (Corts, 1953).

The contrast in these descriptions and terms is highly significant. Galino was acknowledged to have a greater competence in the

specialization than her rivals: she was more "confident" and boasted a "greater specialization and commitment to the discipline" than the other candidates, who evidenced "glibness" and a "pedagogical formation [that] seems more deficient". And yet, this recognition of superiority faded into the background when describing her "merely acceptable" level or her "mediocre" performance, in contrast to the "brilliance", the "richness of suggestion" and "the expositional rigor" of her competitors.

One could undoubtedly point to limitations in the formation of Galino, who received her degree basically from short courses taken immediately after the civil war. In fact, the only courses she studied under somewhat normal conditions, before the outbreak of the war, were Greek Language, Spanish Literature and History of Culture (Expediente académico, 1940). However, the documents from this examination make it difficult to question her disciplinary competence (Galino, 1953). In addition to her published work, which at the time was already considerable, Galino presented a lengthy memory with two syllabuses: one for the History of Pedagogy, with 60 topics, and another for the History of Spanish Pedagogy, with 35 topics. The memory was accompanied by five volumes of appendices. The first of these included a list of 662 documents relating to the History of Spanish Pedagogy from the National Historical and the Crown of Aragon archives and the National Library, as well as a list of another hundred documents from the archives of Simancas and the University of Salamanca. The other four volumes contained 7541 bibliographical references in Spanish, English, French, German and Italian, classified according to the topics of the syllabus.

This commanding display of disciplinary competence was disdained by the tribunal president, for whom "the imposing appearance of the bibliographical trappings" could not cover up the "serious shortcomings" of the bibliography. What the judicious professor of the Philosophy of Law, José Corts y Grau, failed to mention was just what volumes Galino was missing in the more than seven thousand that she presented. Nor did he need to; what was really guiding his judgement was not a concern with any disciplinary competence but rather a prejudice against women that had profound roots in the academic community. The real subject of debate here was the potential access, for the very first time in the history of Spanish universities, of a woman to the highest academic category by public examination. At such a juncture, disciplinary competence could only take a back seat to gender stereotypes (Gómez, 2019; García y

Pérez, 2017). The contrast of a mature and efficient – albeit mediocre – woman with two young men who, though less technically gifted were nonetheless "brilliant", fit in perfectly with the mental schemes so firmly grounded in the world of academics.

In keeping with their arguments, the president Corts y Grau voted for Láscaris while the secretary Millán Puelles cast his vote for Artigas. The professors of the Pedagogy Section chose Galino. In this way her thesis supervisor Zaragüeta along with her colleagues Romero and García Hoz expressed their recognition of Galino's competence in the field and at the end of 1953 helped her to become the first woman to obtain a university chair by public examination in Spain (BOE, 18/02/1954).

* * *

A detailed study, based on documents, of the first university chairs after the war can provide us with much greater knowledge and understanding of the reconstruction process of Spanish pedagogy after the radical break that came with the Civil War. It is not our intention here to undertake a characterization of this process, although an analysis of these chairs certainly brings to light elements of unquestionable interest. To begin with, it confirms the central role played in the entire process by García Hoz, who had previously consolidated his position outside of the university in the Pedagogy Institute of the CSIC. At the same time, the frustrated chair sought by Fernández Huerta indicates that this predominance was relative. Beyond their common adhesion to the political regime at the time, academic communities under Francoism were host to complex alignments and loyalties which, while not always strictly ideological or professional, were key in the way the discipline was defined. In this sense, the sources used in the study show that we would be wrong to conclude that the opposition between García Hoz and Romero should be attributed to a broader rivalry between Catholics and Falangists. To the contrary, Romero's positions were more national-Catholic than those of García Hoz, who was at least able to concede a disciplinary autonomy to Pedagogy outside of Philosophy and Religion. The study also shows that the Pedagogy Section depended for its consolidation on chaired professors from other areas who saw these examinations as an opportunity for their students who lacked options in their own fields. All of this highlights the randomness of these academic

selection processes which, while crucial for configuring a discipline, inevitably include discretionary, arbitrary elements that are not easily reduced to ideological, political or even disciplinary alignments.

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Simultaneous auditory-visual support in grammatical intervention in subjects with intellectual disability

El apoyo auditivo-visual simultáneo en la intervención gramatical en participantes con discapacidad intelectual

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Abstract

Introduction: Studies of linguistic profiles in intellectual disability (ID) show that grammatical competence can be altered in some genetic syndromes. Research on language learning in ID reveals that the role of audition is compromised, vocabulary and grammar acquisition are determined by its scarce ability in auditory memory and visual material facilitates sounds recognition, vocabulary and grammar. Aims: To determine whether simultaneous auditory-visual support improves language increasing sounds recognition, vocabulary and grammar, and to analyse whether ID participants with a higher level of verbal age and auditory memory obtain better results in sounds, vocabulary and grammar after intervention. Method: The design is cuasi-experimental pre-test and post-test with an experimental group and a control group. The sample is composed of 12 ID participants ranging in age from 10;11 to 16;11, receiving special education. Procedure: Auditory-visual material made up of 50 sequences of ARASAAC pictograms associated with 50 sounds. Results: A significant increase after intervention concerning sounds, vocabulary and grammar; the participants from the experimental group with higher auditory memory only increased their vocabulary after intervention. Discussion: This intervention is effective and show the importance of visual support in linguistic development in ID.

Key words: intellectual disability, grammatical development, genetic syndrome, augmentative systems, auditory-visual support.

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Resumen

Introducción: Los estudios de los perfiles lingüísticos en discapacidad intelectual (DI) muestran que la competencia gramatical está afectada en algunos síndromes genéticos. La investigación sobre el aprendizaje del lenguaje en DI revela que el papel de la audición está comprometida, que la adquisición de vocabulario y gramática está determinada por su escasa capacidad de memoria auditiva y que el material visual facilita el reconocimiento de sonidos, vocabulario y gramática. Objetivos: Determinar si el apoyo auditivo-visual simultáneo mejora el lenguaje incrementando el reconocimiento de sonidos, vocabulario y gramática, y analizar si los sujetos con DI con mayor nivel de edad verbal y de memoria auditiva obtienen mejores puntuaciones en sonidos, vocabulario y gramática después de la intervención. Metodología: El diseño es cuasiexperimental pretest-postest con grupo experimental y grupo control. La muestra está formada por 12 participantes con DI entre 10;11 y 16;11 años, escolarizados en educación especial. Procedimiento: Material auditivo-visual de 50 secuencias de pictogramas ARASAAC asociadas a 50 sonidos diferentes. Resultados: Incremento significativo post-intervención en sonidos, vocabulario y gramática; y un aumento de vocabulario post-intervención en los participantes con mayor amplitud de memoria auditiva. Discusión: Esta intervención es efectiva y refleja la importancia del material visual en el desarrollo lingüístico en DI.

Palabras clave: discapacidad intelectual, desarrollo gramatical, síndrome genético, sistemas aumentativos, apoyo auditivo-visual.

Introduction

The *American Association for Intellectual Disability and Development* (AAIDD) has been defining Intellectual Disability (ID) for more than a century. In its eleventh and most recent edition, the following definition can be found: *Intellectual Disability is characterized by significant limitations both in intellectual functioning and adaptive behaviour just as is manifested in conceptual, social and practical adaptive abilities. This disability appears before 18 years of age* (Schalock et al., 2010). Currently, ID is no longer considered as an absolute trait of a person, but rather as a socio-ecological construct, in which the rights related to the welfare of a person and their social participation are highlighted, and where language and communication play an essential role.

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ID has its origin in a diversity of causes which affect the development of the brain before birth, during birth or during infancy or adolescence. In some cases, the cause of ID is from an unknown origin and is not associated with a genetic syndrome. In other cases, the cause is associated with different neuro-evolutionary genetic syndromes (NGS) of unknown origin which manifest different phenotypical characteristics, which should be understood by studying the atypical, development trajectory from infancy in each syndrome (Karmiloff-Smith, 2007). This has brought about the establishment of a paradigm of 'syndrome specificity' which reveals that the comparison of the three most prevalent genetic syndromes, Down syndrome (DS), Williams syndrome (WS) and Fragile X syndrome (FXS), shows very significant differences in communicative and linguistic development from very young ages, because of which, study of this area is essential for speech therapy intervention in ID (Rondal & Ling, 1995).

Apart from inter-syndrome variations, each syndrome presents a complex profile with strengths and weaknesses in different commands of language (Diez-Itza, Martínez, & Espejo, 2004). Studies on a morphosyntactic level show that this is affected in the three most studied, genetic syndromes (Abbeduto et al., 2001; Diez-Itza, Martínez, Fernández-Urquiza, & Antón, 2017; Diez-Itza & Miranda, 2007; Diez-Itza, Miranda, Pérez, & Martínez, 2019; Martin, Losh, Estigarribia, Sideris, & Roberts, 2013), thus obtaining lower scores than subjects with typical development (TD) when compared in terms of non-verbal mental age (Benítez-Burraco, Garayzábal, & Cuetos, 2016; Estigarribia, Roberts, Sideris, & Price, 2011; Martin et al., 2013) or by the Mean Length of Utterance (MLU) (Diez-Itza et al., 2017; Eadie, Fay, Douglas, & Parson, 2002; Roberts, Hennon, Price, Dear, Anderson, & Vandergrift, 2007). In this way, these studies show that the most frequent errors in grammatical categories are the omission of articles and pronouns as well as the substitution of prepositions and verb conjugation, while the grammatical categories of nouns, adjectives, verbs and adverbs, do not show such significant alterations (Diez-Itza et al., 2017; Diez-Itza & Miranda, 2007; Diez-Itza et al., 2019; Eadie et al., 2002; Estigarribia et al., 2011; Vicari, Caselli, & Tonucci, 2000).

This specific pattern of errors in grammatical categories, which these three syndromes share, could be associated with ID, but no specific research has been carried out on the grammatical development in other NGS associated with low-incidence ID, nor with ID of unknown origin which allows for the establishment of this pattern. The difficulties in the

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knowledge of morphosyntax, such as statements formed by fewer than two words and the lack of nouns and verbs in a grammatical construction, would mean that communicative interactions in subjects with ID would be more quantitatively and qualitatively reduced.

Some NGS associated with ID manifest a more reduced auditory memory than those children with TD (Fisch et al., 2012; Lanfranchi, Cornoldi, Drigo, & Vianello, 2009; Pierpont, Richmond, Abbeduto, Kover, & Borwn, 2011; Seung & Chapman, 2000). In cognitive models (Baddeley, 1986, 2000), auditory memory or working verbal memory are divided into phonological loop and articulatory storage. It has been hypothesized that phonological loop is crucial for the acquisition of phonological representations of new words (Baddeley, Gathercole, & Papagno, 1998) and that problems in this storage might constitute an important risk factor in the development of language (Gathercole & Baddeley, 1990). In this regard, a lower response to auditory stimuli (sounds and words) of subjects with NGS could be due to problems in phonological storage (Abbeduto & Chapman, 2005; Van der Molen, Van Luit, Jongmans, & Van der Molen, 2007) which would be manifested in lower comprehension and acquisition of vocabulary, in learning difficulties (Hulme & Mackenzie, 1992; Pierpont et al., 2011), in the repetition of sentences of more than two elements (Marcell, Ridgeway, Sewell, & Whelan, 1995) and in errors of omission or substitution of morphemes of gender and number in nouns (Diez-Itza & Miranda, 2007). In this way, a relationship has been observed between procedural memory and syntactic development in TD and atypical development outside the first evolutionary moments of language development (Alfaro-Faccio & Figueroa-Leighton, 2019). Due to the problems which subjects manifest with NGS associated with ID, it could be hypothesized that they show a deficit in this type of memory.

On the other hand, there are studies which point out that the visual material used in intervention situations help to improve some aspects of communication and language in ID. In this way, an improvement in lexical and morphosyntactic development has been found when static and dynamic visual support have been used. On one hand, the capacity for remembering vocabulary in children and adolescents with DS increased when this visual support was used as a basis for memory and the elicited production of new words (Burgoyne, Duff, Clarke, Buckley, Snowling, & Hulme, 2012; Chapman, Sindberg, Bridge, Gigstead, & Hesketh, 2006). Also, the intervention programmes that use images to

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improve morphosyntactic development positively favoured a growth in lexicon in a group with DS between 6 and 14 years of age (Moraleda, López-Villaseñor, & Garayzábal, 2013). Also, Aguado and Peralta (2001) suggested supporting the intervention of combinations of two words with visual material, given that these support the beginnings of syntactic development. On the other hand, the use of television programmes and pictures of complex events or stories without words increased the MLU and the complexity of statements in situations of personal narration both in subjects with DS (Miles, Chapman, & Sindberg, 2006) as well as with FXS, who also increased the total number of words, of different words and of sentences (McDuffie et al., 2017). Finally, the manipulation of cartoons without verbal language by inserting grammatical elements on the visual sequence of the story favoured coherence and cohesion in narratives and increased MLU in children, adolescents and adults with DS and WS (Diez-Itza, Martínez, Pérez, & Fernández-Urquiza, 2018; Diez-Itza & Miranda, 2005). However, none of these research projects supplied simultaneous auditory and visual support in order to favour lexical and grammatical development.

Fundamental support which can be made available in linguistic intervention in ID is the use of Augmentative and Alternative Communication Systems (AACS), which are forms of expression different to oral language whose objective is to increase the possibilities or compensate for difficulties in communication and language. Predominant evidence suggests that the AACS, which includes systems of gestural symbols and systems of graphic symbols, promote the development of language (Marrus & Hall, 2017). It has been observed that the incorporation of these AACS increased vocabulary, amplifying and densifying the semantic network in a group of children with ID without language (Van der Schuit, Segers, van Balkom, & Verhoeven, 2011) and an adult with moderate ID and severe difficulties in their expressive language (Cheslock, Barton-Hulsey, Romski, & Sevci, 2008) as well as the MLU in a case study of a girl with ID and delayed expressive language (Pattison & Robertson, 2016). The iconicity of different AACS has been studied in healthy adults and children with ID (Mirenda & Locke, 1989) and it has been found that PCS (Picture Communication Symbols) is the most transparent and that the system Bliss is the most opaque (Schlosser & Sigafoos, 2002). Among these graphic systems of pictograms, the system ARASAAC (Aragonese Centre for Augmentative and Alternative

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Communication), developed by the Portal of the Comunidad Autónoma de Aragón, can be found in Spanish territory and is freely available with a CreativeCommons licence. More recent research has shown that the pictograms ARASAAC have a high rate of iconicity and show a higher level of clarity of meaning that of PCS and that of Bliss (Cabello & Bertola, 2015). Furthermore, this high iconicity can be related to a greater ease of learning, as has been demonstrated in research with children with language difficulties without ID (Cabello & Mazón, 2018). This research has centred on the presentation of visual or gestural material but none contemplates the use of sounds associated with images.

The objectives of this work are, firstly, to determine if the programme of intervention with simultaneous auditory-visual support improves language in subjects with ID in the recognition of sounds, level of vocabulary and grammatical development measured through word classes and length of sentences. Secondly, it aims to analyse whether the subjects with ID who show a greater level of verbal age and auditory memory obtain higher scores in recognition of sounds, level of vocabulary and grammatical development after intervention.

And so, the hypotheses that are put forward are that all the subjects increased recognition of sounds and lexical and grammatical productivity with linguistic intervention that is based on simultaneous audio-visual material, and that those who have a higher level of verbal age and auditory memory will obtain higher scores on the variable under study after the intervention.

Method

Participants

The sample was made up of 12 participants (8 boys and 4 girls) with ID and with or without an associated genetic syndrome. The chronological age range was between 10;11 years of age and 16;11 years of age (M= 13.31 and SD= 2.073). Of the entire sample, six subjects were assigned to an experimental group (EG) with a chronological age range of between 10;11 years of age and 15;05 years of age (M= 12.60 and SD= 1.803) and the other six were placed in a control group (CG) with an age range of between 13;01 years and 16;11 years of age (M=15.04 and SD=1.112). While

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the EG had three subjects with ID with an associated genetic syndrome (Down syndrome, Fragile X syndrome and Jacobsen syndrome), in the CG there were four (three participants with Down syndrome and one with Klinefelter syndrome). All of them were attending school in a State School for Special Education in the north of Spain, the six youngest were studying in Compulsory Basic Education I and the six older subjects were studying in Compulsory Basic Education II.

Sample selection was carried out using the incidental non-probability sampling technique. There were three selection criteria: the diagnosis of ID which appears in the official ruling on their education, a minimum verbal age (VA) of 3;6 years and a Mental Age (MA) below a percentile of 5.

The size of the sample may be considered sufficient to determine the existence of differences in the variables under investigation, especially taking into consideration their appearance in the context of an important individual variable in all of these.

Before beginning this study, the parents or guardians of the participants were informed about its objectives and signed an informed consent. Permission was also given from the institution where the research was carried out.

Materials

For the assessment

The standardized tests used were the Peabody Test of Vocabulary and Images (PPVT-R) (Dunn and Dunn, 1981) to establish the linguistic age of the participants in terms of receptive vocabulary, and the CPM Scale in colour from the Raven´s Progressive Matrices (Raven, 2001), which allows the obtainment of an estimation of general intelligence. In the same way, the sub-scale of Digits from the Wechsler Intelligence Test for children was used in its revised form (WISC-R) (Wechsler, 1993), to determine the level of auditory memory (AM).

The materials used in the pre-test (PRE) and post-test (POST) sessions in the tasks Sounds, Vocabulary and Grammar were the same. The Sounds task consisted of presenting in audio format 50 sounds divided into six environments (home, kitchen, bathroom, city, animals and other sounds) from the Sound Bank of the Ministry for Education, Culture

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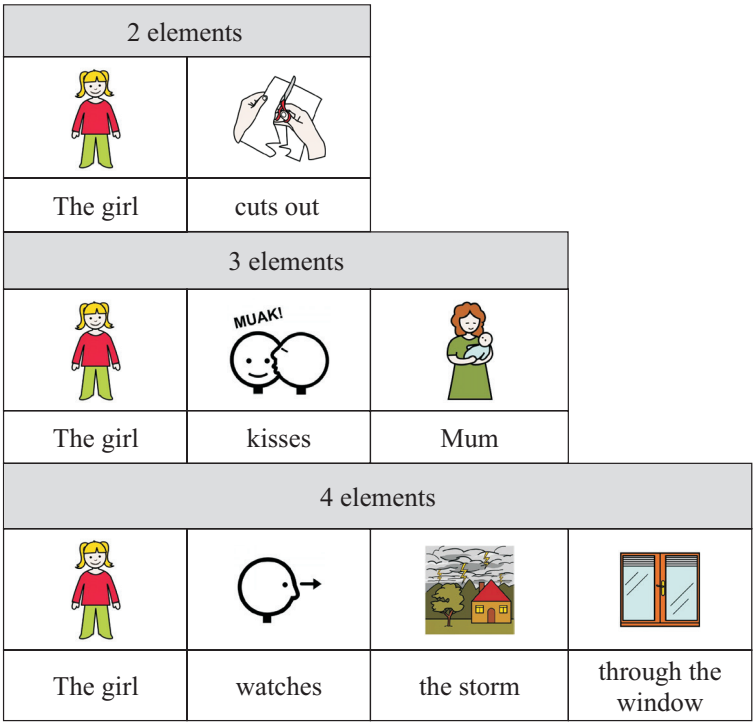
and Sport, stored in a computer connected to sound equipment and which was heard through headphones. In the Vocabulary task, 150 colour pictograms ARASAAC were used. These were classified as nouns (n=96), verbs (n=50) and adverbs (n=4). In the Grammar task, 13 prints of different sequences of pictograms were used. These were ordered according to their level of complexity, reaching a total of 40 grammatical elements: three prints with 2 pictograms, six prints with three pictograms and four prints with four pictograms. The format used to assess Grammar are shown in Figure 1.

FIGURE 1. Example of the prints used for Grammar Evaluation



A voice recorder was used to record the verbal emissions of the participants in the three tasks in the PRE and POST sessions and these were noted on their corresponding answer sheets.

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For the intervention

The materials used were 50 sequences of four pictograms ARASAAC associated with 50 different sounds.

Procedure

The assessment and intervention sessions were carried out individually in the same order with each participant and with the same researcher each time, in the classroom for Hearing and Language in the participants' school. There were seven assessment sessions in PRE, two of which were standardized tests and five non-standardized. There were also five sessions in POST.

The PRE and POST sessions were carried out in the same way, the instructions being different for each task. In the Sounds task the instructions were: *'You are going to hear a sound and you have to tell me what it is, alright?'* Next the participant's headphones were put on, the first sound was reproduced and the subject was asked: *'What did you hear?'* In the Vocabulary task the instructions were*: 'I'm going to show you some pictures and you have to tell me what they are, alright?'* Immediately after that subjects were shown 150 prints with each individual pictogram and the subjects were then asked: '*What /Who is it?' 'What are they doing?'* or *'When/How much is it?'* according to the grammatical category, noun (NOM), verb (VRB) or adverb (ADV). In the Grammar task the instructions were*: 'I'm going to show you some pictures and you have to tell me what's happening in them, alright?'* Following this, 13 prints were shown with each sequence of two, three or four pictograms and the subject was asked: *'What's happening here?'* The researcher recorded the audio and registered the answers of each participant for each question on their corresponding answer sheet. Some examples of answers given by the participants in the PRE and POST sessions were: in Sounds, for *'cistern', 'poop'* in PRE and *'cistern'* in POST; in Vocabulary for *'traffic jam', 'cars'* in PRE and *'traffic jam'* in POST; and in Grammar for *'The girl watches the storm through the window', 'thunder'* in PRE and *'Girl watches storm window'* in POST.

The intervention programme consisted of eight consecutive sessions, one each week, which at the same time, was divided into two parts of 30 minutes each. In the first part 25 sequences of pictograms+sounds (1 to 25) were shown, and in the second part the other 25 sequences (26 to 50) were shown, always in the same order.

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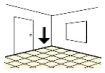
FIGURE 2. Structure of the eight intervention sessions

First and second intervention session			
			
The girl	watches	the storm	through the window
Third and fourth intervention session			
			
The boy	plays	on the game console	in the afternoon
			
The girl	watches	the storm	through the window
Fifth and sixth intervention session			
			
Mum	vacuums	the floor	at home
			
The girl	watches	the storm	through the window
			
The boy	plays	on the game s console	in the afternoon
Seventh and eighth intervention session			
			
Grandpa	listens to	the radio	in bed
			
The boy	plays	on the game s console	in the afternoon
			
The ambulance	takes	a patient	to hospital

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In this way, in the first and second intervention sessions, the participant listened to a sound at the same time as they saw the sequence of four pictograms which made up the sentence and where only one pictogram corresponded to a sound. With the simultaneous presentation of pictograms+sound the subject was asked: *'What did you hear?'* and a verbal utterance was asked for. Immediately after, the researcher gave the correct utterance with the four elements of the sentence. The researcher then asked the subject to repeat what they had heard at the same time pointing to each one of the four pictograms in the sentence. An example of a complete verbal utterance given by the researcher is: '*The girl watches the storm through the window',* in which the pictogram associated with the sound which was heard is the one which is in third place (*storm*). This was carried out with each of the 50 sequences of pictograms+sounds and the presentation of pictograms and sounds was always simultaneous.

In the third and fourth intervention sessions, the researcher showed two sequences of pictograms with only one being associated with the sound heard. The distracting sequence was chosen at random. On presentation of the simultaneous sounds and pictograms, the subject was asked*: 'What did you hear?'*, and the participant had to choose the sequence corresponding to the sound heard and give a verbal response. If the correct response was given, the researcher gave the correct utterance with the four elements of the sentence. If, on the contrary, the response was incorrect, the sound and the two sequences were presented again, and the researcher verbalized the sentence associated with the sound. In both situations the subject was encouraged to repeat the sentence while, at the same time, pointing out each of the four pictograms.

In the fifth and sixth intervention sessions, three sequences of pictograms were presented and only one of these was associated with the sound heard, while in the seventh and eighth sessions, the sequences were of four pictograms and only one of these was associated with the sound heard. The distracting sequences were chosen at random. After the verbal utterance of the participant, either correct or incorrect, the researcher always said the sentence and encouraged its repetition while pointing out each pictogram.

Data Analysis

The score for each of the tasks was different. In the Sounds tasks, a dichotomous scale was used with a score of zero if the answer was incorrect and one if it was correct. In the Vocabulary tasks, scores were both quantitative and qualitative. In the first case, a scale was used with values of zero to three: if the participant did not give a response or said '*I don't know'* a score of zero was given; if the participant uttered one word incorrectly that could not be inferred from the pictogram, a score of one was given; if a word was given that could be inferred from the pictogram, even though it was not the correct word, two points were given; if the correct word was given by the participant, three points were given. In this way, the acquisition of Vocabulary was divided into three levels: if the score was zero or one, it was considered that the word had not been acquired (NO-ADQ), if it was two points, it was considered that the word was in the process of acquisition (PRO-ADQ), and if the score was three points, the word had been acquired (ADQ). For the qualitative score on the Vocabulary task, the grammatical class of the words the participants said (nouns, verbs and adverbs) were analysed. In the Grammar task a scale was used with values from one to four, assigning one, two, three, and four points according to the number of elements contained in the verbal utterance produced.

The design adopted for this research is quasi-experimental pretest-posttest with two groups, one experimental group and one control group. The treatment of the data was carried out with the statistical programme *SPSS* version 20.0 for Mac. Descriptive statistics, correlations, the Kolmogorov-Smirnov non-parametric contrast test for two samples, to determine if the EG and the CG were homogeneous before intervention, were all used. Furthermore, the non-parametric Mann-Whitney U test was applied to the two independent samples to know if there were significant statistical differences between EG and CG, as well as the non-parametric Wilcoxon test to determine whether there were differences in the EG before and after the intervention. A post-hoc calculation of the size of the effect (*d*) and the observed power for valuing the effectiveness of the programme in each of the variables between EG and CG was carried out after the intervention. Small effects of the intervention are assumed, when *d* is situated around 0.20, medium effects if it is approximately 0.50 and high effects when it is situated around 0.80 (Cohen, 1988).

Results

Table 1 shows the Mean (M) and the Standard Deviation (SD) of the EG and CG in the variables CA, VA, MA and AM.

TABLE 1. Descriptive statistics of Chronological Age (CA), Verbal Age (VA), Mental Age (MA) and Auditory Memory (AM) of EG and CG.

	CA M (SD)	**VA M (SD)**	**MA M (SD)**	**AM M (SD)**
EG	12.42 (1.842)	5.26 (2.042)	19.33 (5.428)	2.17 (3.371)
CG	15.04 (1.112)	5.36 (1.618)	16.60 (6.348)	3.00 (3.162)

No statistically significant differences have been found between EG and CG in the variables VA (Z=0.577; p=0.893), MA (Z=0.577; p=0.893), AM (Z=0.577; p=0.893) and neither in Sounds (SON) (Z=0.866; p=0.441), Vocabulary (VOC) (Z=0.866; p=0.441) and Grammar (GRA) (Z=0,866; p=0,441), which leads us to assume that the two groups were homogeneous in these variables before intervention.

In Table 2 the results obtained are shown for the two groups in SON, VOC and GRA in the two situations PRE and POST showing a value of Z, its significance at the intra-group level (EG) and inter-group level (EG-CG) and the size of the inter-group effect. It can be observed that there are significant statistical differences between the EG and the CG after intervention in the three variables under study, the largest being in SON (Z=-2.892; p=0.004) and in VOC (Z=-2.732; p=0.004) with a large size of effect ($d < 0.8$) of 3.978 and of 1.888, respectively. The power observed in these two variables is very high, oscillating between 0.999 and 0.837 while in the case of the variable GRA it is at 0.482. Furthermore, the participants in the EG obtain scores in the POST that show significant statistical differences in comparison with those obtained in the PRE in the three variables. They also show a more significant increment in the POST in SON and VOC (Z=-2.201; p=0.028).

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TABLE 2. Descriptive statistics, difference in means level of intra-group and inter-group significance and size of the effect on Sounds, Vocabulary and Grammar.

	EG		**CG**		**Intra-group**		**Inter-group**		
	PRE	POST	PRE	POST					
	M (SD)	M (SD)	M (SD)	M(SD)	Z	p	Z	p	d
Sounds	25.83 (6.494)	45.67 (3.670)	29.67 (5.164)	30.33 (4.033)	-2.201	.028	-2.892	.004	3.978
Vocabulary	90.17 (18.894)	139.17 (11.957)	101.50 (23.253)	103.67 (23.737)	-2.201	.028	-2.732	.004	1.888
Grammar	30.67 (7.474)	39.50 (1.225)	35.50 (4.416)	34.17 (7.494)	-2.023	.043	-2.623	.009	0.992

Table 3 shows the results obtained by the two groups in the six different environments of Sounds in PRE and POST showing a value of Z, its significance on the intra-group level (EG) and inter-group level (EG-CG) and the size of the inter-group effect. It can be observed that there are statistically significant differences between the EG and the GC after the intervention in all environments with the exception of *City* and *Bath*, even though, in this last case, the size of the effect is large (d=1.328) but not the observed power which reaches an average value (0.547). On the other hand, it is found that the size of the effect is large (d<0.8) in *Kitchen* (d=3.263), *Home* (d=2.455), *Other Sounds* (d=2.395) and *Animals* (d=2.213) and the power observed oscillates between 0.999 and 0.931. Furthermore, the participants of the EG obtained greater average scores in the POST than in the PRE in the six environments where a greater number of recognized sounds is observed after intervention, these being statistically significant differences in all environments except *Bath*.

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TABLE 3. Descriptive statistics, difference in means, level of intra-group and inter-group significance and size of the effect in Sounds in the six environments.

	EG		CG		Intra-group		Inter-group		
	PRE	POST	PRE	POST					
	M (SD)	M (SD)	M (SD)	M (SD)	Z	p	Z	p	d
Home	6.00 (2.449)	10.50 (0.548)	6.83 (2.563)	6.83 (2.041)	-2.214	.027	-2.714	.007	2.455
Kitchen	2.67 (1.366)	7.50 (0.837)	3.33 (1.751)	4.00 (1.265)	-2.264	.024	-2.956	.003	3.263
Bath	5.00 (1.235)	5.33 (1.211)	2.83 (1.169)	3.33 (1.751)	-1.633	0.102	-1.917	.055	1.328
City	2.83 (1.169)	5.33 (1.211)	4.33 (0.816)	4.33 (1.033)	-2.214	.027	-1.511	.131	0.888
Animals	5.33 (1.033)	7.00 (.000)	5.33 (0.816)	5.17 (1.169)	-2.060	.039	-2.690	.007	2.213
Others	5.00 (2.898)	10.00 (1.549)	7.00 (1.265)	6.67 1.211)	-2.207	.027	-2.517	.012	2.395

Table 4 shows the results obtained for the two groups in VOC in PRE and POST presented in the value of Z, the significance on the intra-group level (EG) and the inter-group level (EG-CG) and the size of the inter-group effect. It can be observed that there are significant statistical difference between the EG and the CG after the intervention in the averages for Vocabulary not acquired (NO-ADQ), in the process of acquisition (PRO-ADQ) and acquired (ADQ). It can be seen that the size of the effect is large in the three levels of VOC, being PRO-ADQ and ADQ where the size of the effect is greater (d=2.260 and d=1.888, respectively) and the power observed in these two variables oscillates between 0.941 and 0.837. Furthermore, the participants in the EG obtained greater average scores in the POST than in the PRE in acquired vocabulary.

On the other hand, it can be observed that there are significant statistical difference between the EG and the CG after the intervention in averages for Nouns (NOM), Verbs (VRB) and Adverbs (ADV), but it is in VRB where the size of the effect is greater (d=1.879) as well as the power observed (0.834). Also, the participants of the EG obtained greater average scores in the POST than in the PRE in NOM and in VRB, where the percentage increment is 78% in VRB and 40% in NOM.

TABLE 4. Descriptive statistics, difference in means level of intra-group and inter-group significance and size of the effect in Vocabulary.

	EG		CG		Intra-group		Inter-group		
	PRE	POST	PRE	POST					
	M (SD)	M (SD)	M (SD)	M (SD)	Z	p	Z	p	d
NO-ADQ	28.17 (9.704)	5.33 (6.088)	31.67 (21.229)	29.33 (21.068)	-2.201	.028	-2.751	.006	1.546
PRO-ADQ	31.67 (11.639)	5.50 (6.058)	16.83 (2.714)	17.00 (3.847)	-2.207	.027	-2.495	.013	2.266
ADQ	90.17 (18.894)	139.17 (11.957)	101.50 (23.253)	103.67 (23.737)	-2,201	.028	-2.732	.006	1.888
NOM	64.33 (10.745)	90.17 (6.401)	68.00 (14.859)	70.67 (14.679)	-2.207	.027	-2.571	.010	1.722
VRB	26.17 (8.134)	46.67 (3.559)	33.00 (8.173)	32.83 (9.786)	-2.207	.027	-2.887	.004	1.879
ADV	0.00 (0.000)	2.50 (1.975)	0.00 (0.000)	0.00 (0.000)	-1.890	.059	-2.309	.021	1.790

Note: NO-ADQ = Not Acquired; PRO-ADQ = In Process of Acquisition; ADQ = Acquired; NOM = Nouns; VRB = Verbs ADV = Adverbs.

Table 5 shows the results obtained in the production of the number of grammatical elements in PRE and POST presented in the value Z, its significance on the intra-group level (EG) and the inter-group level (EG-CG) and the size of the inter-group effect. It is in the production of 4 elements where there are significant statistical differences between the EG and the CG after intervention, and almost reaching this in the production of 2 and 3 elements. Even though the size of the effect is large in the production of 2 and 4 elements, the power observed in both variables is close to reaching and average value (0.431). On the other hand, even though the EG participants reach a ceiling score in the production of 2 and 3 elements, the differences are only statistically significant in the production of 4 elements.

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TABLE 5. Descriptive statistics, difference in means, level of intra-group and inter-group significance and size of the effect in Grammar.

	EG		CG		Intra-group		Inter-group		
	PRE	POST	PRE	POST					
	M (SD)	M (SD)	M (SD)	M (SD)	Z	p	Z	p	d
2 elements	1.77 (0.403)	2.00 (0.000)	1.77 (0.403)	1.66 (0.421)	-1.342	0.180	-1.892	.059	1.142
3 elements	2.30 (0.710)	3.00 (0.000)	2.69 (0.355)	2.58 (0.787)	-1.826	.068	-1.892	.059	0.787
4 elements	2.87 (0.627)	3.87 (0.306)	3.50 (0.316)	3.41 (0.491)	-2.070	.038	-2.263	.024	1.124

In relation to the second objective of this study, the correlational analyses showed that the participants with a higher level of VA and of AM in the CG and EG did not obtain a statistically significant correlation among these variables and the recognition of sounds and grammatical development after the intervention. However, a statistically significant correlation was observed between AM and level of vocabulary in the EG (R=0.823; p=0.044), and between the VA and the level of vocabulary in the CG (R=0.956; p=0.003) after the intervention.

Discussion

The main objective of this work was to determine if the programme of intervention with simultaneous auditory-visual support improves language in subjects with ID in the recognition of sounds, in level of vocabulary and in grammatical development. The results showed that the participants with ID in the EG increased the number of sounds recognized, the acquisition of vocabulary and grammatical production in terms of word class and the number of elements in each sentence after the intervention.

The effect of the intervention in the recognition of sounds is greater in the environments of *Kitchen, Home* and *Animals* than in the environments of *City* and *Bath,* where the effect was lower. One possible explanation for these results is that the participants found these sounds

very familiar in these contexts since they are more present in family and school contexts. On the other hand, the sounds for the environments *Kitchen, Home* and *Animals* could be more novel because they cover a wider and less frequent repertoire of sounds.

A second objective was to observe whether the subjects with ID showed a greater level of verbal age and auditory memory by obtaining higher scores for sounds, vocabulary and grammatical development after the intervention. However, the results showed that the EG participants, with a larger range of auditory memory, only improved their level of vocabulary after the intervention, but they did not recognize more sounds or produce more elements in the sentences than those participants that had a lower level of auditory memory. On the other hand, starting with a higher level of verbal age does not imply that they may benefit more from this programme of intervention, which allows for its application with subjects with ID with a low level of VA. This result could be explained by the intra-group variability in the subjects with ID, which has already been specified in other research (Benítez-Burraco et al., 2016; Estigarribia et al., 2011).

The participants in this study, the same as some subjects with NGS (Benítez-Burraco et al., 2016; Fisch et al., 2012; Lanfranchi et al., 2009; Pierpont et al., 2011; Seung & Chapman, 2000), showed a more reduced range of auditory memory than those subjects with TD. Despite this, the support of auditory-visual material has allowed an increase in vocabulary and in the number of elements in their sentences, similar to that observed in other research (Hulme & Mackenzie, 1992; Miles et al., 2006; Moraleda et al., 2013). Repeated exposure to the same lexicon for eight weeks of intervention would facilitate the construction of phonological representations of new words in phonological loop (Baddeley et al., 1998), with the resulting increase in their vocabulary and densification of semantic connections (Burgoyne et al., 2012; Chapman et al., 2006; Van der Schuit et al., 2011). The results of the study are in line with the interaction between an increase in vocabulary and improvements in phonological specification which has been observed in children in their early years of linguistic development (Ramón-Casas & Bosch, 2014).

With regard to the nature of grammatical structure and due to the fact that the possible pattern of morphological errors in ID affects articles, pronouns, prepositions and conjugation of verbs (Diez-Itza et al., 2017; Diez-Itza & Miranda, 2007; Diez-Itza et al., 2019; Eadie et al., 2002;

Estigarribia et al., 2011; Vicari et al., 2000), the preserved grammatical elements have been used (nouns, verbs and adverbs) as a basis for the intervention programme. The results confirm that the participants increased these basic grammatical elements, in particular, an increase of 78% in the *Verb* category and 40% in *Nouns* was produced, which confirms the growing evolution of the grammatical competence of the participants with ID in this study. This shows that they were capable of learning a richer and more complex grammar in a continuous and increasing way. Also, the basis on which the material for grammatical intervention has been designed is significant for the participants since many of the concepts chosen already formed part of their lexical repertoire, which is in keeping with the need for a 'critical mass' of vocabulary in order to develop a particular level of grammatical complexity (Marchman & Bates, 1994). This suggests that interventions should be fundamentally based on nominal and verbal categories which are central to the construction of syntactic structures in Romance languages (Serrat et al., 2010).

Also, grammatical production increased significantly in the production of four elements which may suggest that procedural memory also improves even though this has not been explicitly evaluated in this study. These results coincide with previous research which has obtained that the use of visual material in intervention situations increases MLU independent of whether the material is static or dynamic (Diez-Itza et al., 2018; McDuffie et al., 2017; Miles et al., 2006). In this study, the facilitating effect of visual support through pictograms ARASAAC on the grammatical level has also been observed, and which is confirmed in the increase in the number of elements per sentence after the intervention. This facilitating effect has also been observed in other studies of the ID population (Cheslock et al., 2008; Pattison & Robertson, 2016; Van der Schuit et al., 2011), in which the use of AACS has been used as support to compensate for difficulties in communication and language to increase the knowledge of concepts, that is to say, they promote the development of language.

However, there is no previous research on the benefits of an intervention which simultaneously uses sounds and graphic symbols, which contribute different semantic characteristics to one concept, as has been used in this study. The simultaneous presentation of sound and image entails, therefore, a cognitive enrichment of concepts which allows subjects with ID to construct longer sentences, which can be deduced

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from the results obtained. This improvement in language from auditory-visual material coincides with the idea that all those with ID need specific support which benefits their communicative and linguistic development, given that the use of language has transversal consequences in all areas, moments and contexts of development. So, language is converted into a vehicle which allows them to carry out personal and socio-emotional interactions which leads them towards a richer and more independent life.

Finally, despite the encouraging results obtained, two limitations must be mentioned: on the one hand, the size of the sample, since these results could not be extrapolated to the entire ID population, and, on the other hand, the number of intervention sessions may not be sufficient to consolidate grammatical learning in new situations, therefore this type of communicative intervention should be continued.

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So much for certain: analysis of the measure of early leaving from education and training[1]

Tanto por cierto: análisis de la medida del abandono temprano de la educación y formación

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Abstract

The measure of Early Leavers from Education and Training (ELET) is a basic indicator for the design of policies aimed at promoting continuity and success in the educational trajectories of students. This measure is obtained through the Active Population Survey (APS), a powerful instrument that studies the national economic activity in relation to its human component. The calculation of the ELET is made from certain variables that already existed in the APS, being currently the official measure. Our research aims to analyze in detail what is measured by the APS and how: operationalization, sampling procedure, sample size calculation and obtaining answers. For this we resort to the exploitation of the 2018 EPA microdata. The analysis reveals some reflections that we consider of interest to assess the adequacy of this measure to the purposes and uses that are subsequently made of it. The analysis of the measure of the construct indicates that this measure is not determined, but depends on the time and age at which the survey is conducted; likewise, the same type of study may or may not count as school leaving, in addition to limitations in the consideration of some training modalities. In relation to sampling, we question the adequacy of

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the socio-economic variables used in the formation of clusters. The sample size is sufficient at the national level, but not at the regional level and, consequently, it affects the interpretation of results. Finally, the reliability of hetero-informed survey procedures also introduces a possibility of bias in the response. However, the measure of this indicator is proposed through census data that are derived directly from the monitoring and permanence in the education system.

Key words: early school leaving, measure, active population survey, sample size, reliability.

Resumen

La medida del Abandono Temprano de la Educación y Formación (ATEF) es un indicador básico para el diseño de políticas orientadas a promover continuidad y éxito en las trayectorias formativas del alumnado. Esta medida se obtiene en España a través de la Encuesta de Población Activa (EPA), un instrumento potente que estudia la actividad económica nacional en lo relativo a su componente humano. A partir de determinadas variables preexistentes en la EPA se realiza el cálculo del ATEF, siendo actualmente la medida oficial. Nuestra investigación plantea como objetivo analizar detalladamente cómo se establece la medida del ATEF a través de la EPA: operativización, procedimiento de muestreo, cálculo del tamaño muestral y obtención de respuestas. Para ello recurrimos a la explotación de los microdatos de la EPA de 2018. El análisis pone de manifiesto algunas reflexiones que consideramos de interés para valorar la adecuación de esta medida a los fines y usos que se hacen posteriormente de ella. El análisis de la medida del constructo indica que esta medida no es fija, sino que depende del momento y edad en que se realiza la encuesta; asimismo, un mismo tipo de estudio puede computar o no como abandono, además de existir limitaciones en la consideración de algunas modalidades formativas. En relación al muestreo, cuestionamos la adecuación de las variables socio-económicas utilizadas en la formación de conglomerados. El tamaño muestral es suficiente a nivel nacional, pero no así a nivel autonómico y, en consecuencia, afecta a la interpretación de resultados. Por último, la fiabilidad de los procedimientos de encuestas heteroinformadas introducen también una posibilidad de sesgo en la respuesta. Con todo, se propone la medida de este indicador a través de datos censales derivados directamente del seguimiento y permanencia en el sistema educativo.

Palabras clave: abandono educativo, medida, encuesta de población activa, tamaño muestral, fiabilidad.

Outline of the issue

The recognition of education as a right of citizens requires from the State the structuring of an educational system with compulsory stages which must be completed in a certain age range, in addition to promoting the continuation of studies beyond the compulsory phases, placing a value on the social importance of education. In Francoist Spain, this approach did not exist, and so it was not until the General Education Act of 1970 that a stage of compulsory education was established for the first time (Martínez García, 2009). Subsequent legislation extended the age limit from 14 to 16, while maintaining the purpose of education: *to mould free and independent people, critical thinkers, capable of making decisions about our lives, active participants in political and social life* (Aguado Odina and Mata Benito, 2017:22). However, while undoubtedly an advance as regards social rights, it has led to a contradiction: the coexistence, together with the obligatory nature of education, of what is called school failure and early leaving from education and training[2]. The same system, devised as a guarantee of a social good, disregards certain students who do not manage to successfully complete this compulsory stage or who, as soon as it is completed, do not continue any type of formal education. More specifically, the institution created to help them at the same time certifies their failures and disengagements (Escudero Muñoz, González González and Martínez Domínguez, 2009).

The democratization of education therefore initiates a process of exclusion which raises various concerns: why? At what stage? How can we prevent it or provide an alternative solution?

In the context of these questions, we first must look at the following: what do we mean when we speak of Early Leavers from Education and Training (ELET)? To answer, we need to look at the following considerations:

- The concept based on which this number is calculated is not new and nor has it always been the same.
- At official level, it is translated into a percentage which enables it to be compared over time, across different regions or countries.

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(2) The concept has been referred to using various different terms at various different stages. It was originally referred to as *Abandono Escolar Prematuro* (Premature School Leaving), while in the last decade it has been known as *Abandono Educativo Temprano* (Early School Leaving).

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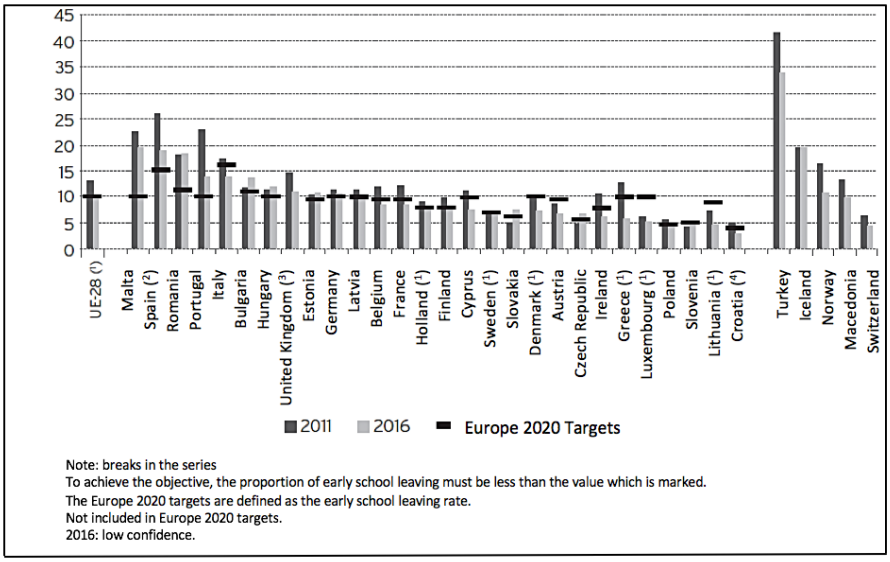
- Based on this number, milestones are established which each country must reach in order to reduce the school leaving rate. Consequently, educational policies and measures are devised and implemented. The 2020 European 2020 Strategy (ET2020) establishes that ELET should not exceed 10% in 2020 (European Council, 2009), 15% in the case of Spain. Countries which do not comply with these commitments will be subject to progressive economic sanctions which can be up to 0.5% of GDP (European Commission, 2012). Figure I below shows the ELET index in the different EU countries and the target established for each of them.

FIGURE I. Targets and rate of ELET in the EU-28 and certain developed countries



Source: Eurostat. Fundación Alternativas (Alternatives Foundation) Inequality Report (2018)

The desire to quantify and compare is evident. Rather than promoting a common forum of measures or solutions, the concern is mostly to establish a comparison between the current figure and the level to be achieved. Why this level has been established and not a different one, or

why a target of 0% has not been set, are matters which are not openly discussed.

All in all, the importance attributed to this numerical value which ascribes a figure to school leaving in post-compulsory education is recognized. Therefore, we consider it important to examine in detail how this number is reached: how is ELET measured? Our objective is to analyze how ELET is measured in practice by means of the APS, examining in particular the implications derived from the selection of respondents and how their response is obtained.

Firstly, we will provide a brief overview as to the definition and operationalization of this concept, a necessary basis in order to subsequently analyze and evaluate the means by which it is calculated.

What do we mean when we refer to ELET: conceptual approximation

Increasingly more research into ELET is taking place both within Spain and internationally. In the systematic review undertaken in a previous research project (Morentin-Encina y Ballesteros Velázquez, 2018), in which the ERIC, Dialnet and Google Scholar databases were used, 196 articles were found between 2015-2018 related to the descriptors "abandono escolar" (school leaving), "abandono de estudios" (leaving studies), "abandono educativo" (leaving education), "fracaso escolar" (school failure), "enganche" (engagement), and their English translations. The analysis suggests certain key insights: on the one hand, the concept is not new, but in fact has been referred to using different names over the years and, consequently, it has been defined in different ways right up to today. On the other hand, we could group together the meaning that authors have given it according to two different trends as regards how it has been approached: process vs. outcome. Although both approaches are present in the decision to leave school (any decision to leave is the end result of a process of school disengagement), the priority of studying one point in time or another determines the focus and direction of each line of research.

As a gradual process of educational disengagement, it can begin in early stages and end with departure from the educational system. This does not happen out of the blue, but is rather a final consequence of progressive disconnection from school (Finn, 2006; Fernández, Mena and

Rivière, 2010; Rumberger, 2011). The study of early school leaving as a process leads one to consider that it as a complex phenomenon in which multiple aspects converge (Escudero Muñoz, 2005; Escudero Muñoz et al., 2009; European Commission, 2013; Cernadas and Marsó, 2014; González González, 2015; Márquez Velázquez, 2016). Certain researchers have focused on different factors such as the level of education and employment status of the parents, educational resources and environment in the home, parental care and supervision of children, ethnicity, gender, age, language, etc. (Lee and Burkham, 2001; Balzano, 2002; Marchesi and Pérez, 2003; Martínez García, 2011; Salvà-Mut, Oliver-Trobat and Comas-Forgas, 2014; Martínez and Torrego, 2017). This line of research focuses on school leaving as a process and mainly highlights social, family and educational factors and experiences which help us to understand how and why the decision to leave is arrived at.

From the point of view of the outcome, the concept of school leaving entails not having attained a certain academic or professional qualification; school failure entails not completing the compulsory stage, while ELET means not completing the post-compulsory stage (Marchesi, 2003; Bolívar Botía and López-Calvo, 2009; Mena, Fernández and Ribiere, 2010; Roca, 2010; Saucedo, 2015). Despite the fact that school failure is a problem in Spain, as shown by the high percentage of students who do not complete secondary level education, educational policies focus on ELET and, consequently, the line of research and intervention with regard to school failure is relatively insubstantial. Nowadays, the concept of ELET has become prevalent, bolstered at European level with each Member State having the option of deciding for themselves what level it considers mandatory. As a result, the approach to school leaving as an outcome focuses on the figure reached, as shown in reports which are periodically produced in official bodies related to public policies.

Even so, different authors handle the concept of ELET in different ways. For Álvarez Blanco and Martínez González (2016), Fontdevila Puig and Rambla Marigot (2015), it refers to students who voluntarily discontinue their studies for various reasons upon reaching the age of 16, without having graduated from compulsory secondary education. For other authors (Fernández et al., 2010; Amer and Pascual, 2013; Ritacco Real and Amores Fernández, 2016), early school leaving refers to post-compulsory education.

The concept of ELET changed in 2014. Although we have been able to discern the particular definitions of different authors and research groups, put simplistically we could say that, until that year, early school leaving meant not having completed the baccalaureate or Intermediate Vocational Training. However, with the LOMCE (Spanish Organic Law for the Improvement of Educational Quality) Basic Vocational Training (FPB in the Spanish acronym) was introduced. Currently, if a person has obtained this level of education it is not considered early school leaving (Morentin-Encina y Ballesteros Velázquez, 2018).

This change represents a turning point in established research paths into early school leaving, which continue to consider ELET as meaning not having achieved ESO (Compulsory Secondary Education), Baccalaureate or Vocational Training certification (Tarabini, Curran, Montes and Parcerisa, 2015).

This complex web of concepts, dimensions and factors is subsequently operationalized in a unique manner, established by the National Statistical Institute (INE in the Spanish acronym) and used in the Active Population Survey (APS). Its results are valuable for the study of sociological matters of significant interest, fundamentally related to the national economic activity in relation to its human component (INE, 2016). The APS is today the only instrument for measuring ELET. All the statistics which are available at national and international level regarding the phenomenon of early school leaving in Spain have as their source the findings of the APS, hence its importance. The official definition of ELET provided by the INE is as follows:

> *Early school leaving is the percentage of people aged 18 to 24 who have not completed second stage secondary education and are not pursuing any type of study-training in the four weeks prior to the interview. Their maximum level of education is level (0-2) of the CNED-2014[3] and they are not receiving any education or training (formal and non-formal), (INE, 2018: 1).*

In order to critically assess the information collected through the APS we need to be familiar with certain aspects related to its operation and computation, which we address in the following sections.

(3) National Classification of Education

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Operationalization of ELET: variables involved

The official measure of ELET uses variables which were already part of the survey protocol: age, engagement or not in some type of study-training (formal and non-formal) in the four weeks prior to the interview and, finally , the highest level of education attained.

We analyze the APS protocol to see what is asked with regard to these points (INE, 2005).

Age: obtained using date of birth, requested within "General Data". The requirement to be met is to be in the interval of 18-24.

Study-training: the information on this variable is collected from two questions in the "Education and training" section. Both refer to the continuation of studies; the first in official programmes and the second in unofficial courses.

IMAGE I. Education and training

F. EDUCATION AND TRAINING

Below you will be asked about your level of education and about the training that you have received

1. **Have you carried out any type of studies or training in the last four weeks included in the official study plans?** CURSR

Yes	1 __
Student on holidays	2 __
No	3 __ Go to 3
Don't know	0 __ Go to 3

...

3. **Have you taken any type of studies or training in the last four weeks outside of official study programmes?**
(Includes: courses delivered by academies, courses in the workplace, courses for the unemployed, seminars, conferences, private classes, etc.). CURSNR

Yes	1 __
Student on holidays	2 __
No	3 __ Go to 8
Don't know	0 __ Go to 8

Source: INE (Spanish National Statistics Institute), Active Population Survey (2005)

From the point of view of the operationalization of ELET, it is interesting to note the consideration of the CNED-14 concerning studies or training outside the official study programmes*: "non-formal education leads to accreditations not officially recognized or which may not in fact lead to any accreditation"* (CNED-14: 6).

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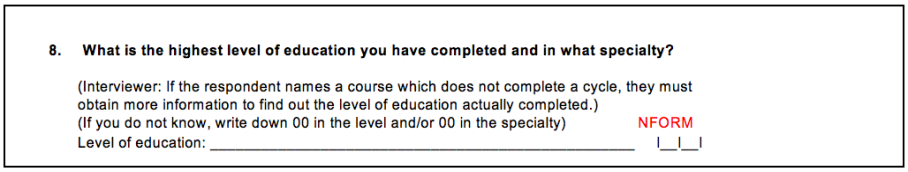
Included here are those courses or activities the objective of which is to practice as a teacher or trainer, since this training will be reflected in a professional certificate (CNED-14: 7).

Highest level of education: this data is obtained from the same section, by means of the question which can be seen in Image II.

IMAGE II. Highest level of education attained



8. What is the highest level of education you have completed and in what specialty?

(Interviewer: If the respondent names a course which does not complete a cycle, they must obtain more information to find out the level of education actually completed.)
(If you do not know, write down 00 in the level and/or 00 in the specialty) NFORM
Level of education: _____ I__I__I

Source: INE, Active Population Survey (2005)

In 2011 (published in 2013), UNESCO established a new International Standard Classification of Education (ISCED 2011). Based on this, the INE revised the national classifications in order to adapt it to these international levels, resulting in CNED-A (Table I).

According to the definition of ELET established by the INE, those whose *"highest level of education is level (0-2) of the CNED-2014"* (INE, 2018:1) will be classed as ELET.

TABLE I. Level of education attained

	CNED-A Categorization of programmes, qualifications and certifications in levels of education attained
0	Illiterate
	Incomplete primary education
1	Primary education
2	First stage of secondary education without Compulsory Secondary Education certification and similar
	First stage of secondary education with Compulsory Secondary Education certification and equivalent
	Professional certificates: Level 1 and similar
	Professional certificates: Level 2 and similar
3	Baccalaureate and similar
	Intermediate level professional training courses, plastic arts and design and sports and similar
	Professional courses in music, dance and similar
	Advanced level certificates from official language schools and similar
	Basic Professional Training
4	Level 3 professional certificates; short-term courses which require second stage secondary education and similar
5	Higher level professional training courses, plastic arts and design and sports and equivalent
	University courses which require baccalaureate, lasting two years or more
6	University courses worth 240 ECTS credits and equivalent
	University diplomas and equivalent
	Expert or specialist university courses, worth less than 60 ECTS credits, access to which requires a university degree
7	University courses worth 240 ECTS credits and equivalent
	Undergraduate degrees and equivalent
	Official university master's degrees and equivalent
	Special courses in Health Sciences via the residence system and similar
	University master's courses (Master's), worth 60 or more ECTS credits, to which access requires a university degree
8	University doctorate

Source: CNED-14 (2014)

Calculating ELET

The cross information of the three variables is what allows for the identification or not of the interviewed person as within the percentage of people classed as ELET.

For the annual measuring of ELET, the information obtained in the four successive applications of the APS in the annual period is used.

Consequently, the calculation will be the average of the four quarterly ratios:

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$$\text{Annual ELET} = \frac{\frac{\sum N_{\text{ELET 1st quar}}}{\sum N_{\text{1st quar}}} + \frac{\sum N_{\text{ELET 2nd quar}}}{\sum N_{\text{2nd quar}}} + \frac{\sum N_{\text{ELET 3rd quar}}}{\sum N_{\text{3rd quar}}} + \frac{\sum N_{\text{ELET 4th quar}}}{\sum N_{\text{4th quar}}}}{4} \text{ x } 100$$

∑NELET: total number of people aged 18-24 years categorized as ELET in each quarter
∑N: total number of people aged 18-24 in each quarter.

Selection of respondents and sample size

The APS is a survey which is carried out at national level (17 autonomous regions and two autonomous cities). Participating subjects are selected by means of two-stage sampling with stratification according to geographic and socioeconomic criteria (INE, 2016)

Through stratification, the aim is to establish groups of families with homogeneous socio-economic characteristics, following the procedure below:

- 1st sampling stage (stratification): taking the census sections of each municipality, the theoretical strata are defined as follows (Table II):

TABLE II. Theoretical strata

Stratum 1:	province capital city
Stratum 2:	self-represented municipalities, significant in relation to the capital
Stratum 3:	other self-represented municipalities, significant in relation to the capital or municipalities with more than 100,000 inhabitants
Stratum 4:	municipalities between 50,000 and 100,000 inhabitants
Stratum 5:	municipalities between 20,000 and 50,000 inhabitants
Stratum 6:	municipalities between 10,000 and 20,000 inhabitants
Stratum 7:	municipalities between 5,000 and 10,000 inhabitants
Stratum 8:	municipalities between 2,000 and 5,000 inhabitants
Stratum 9:	municipalities with fewer than 2,000 inhabitants

Source: INE, 2016:8

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- 2nd sampling stage (sub-stratification) within each stratum: for strata 1-6[4], a cluster analysis is performed based on the following variables[5], the APS' object of study (Table III):

TABLE III. Variables

Census section X	Auxiliary variables										Fiscal variables		
	% unemployed	% inactive	% employed	% foreign	% between 0 and 19 years old	% between 15 and 24 years old	% over 65	% with level 1-3 studies completed (illiterate, no schooling or primary)	% with level 4-7 studies completed (ESO, EGB, Baccalaureate, FP)	% with level 8-12 studies completed (diploma, bachelor's degree, master's degree, doctorate)	Total income per household	Movable and real estate capital income over total income	Farm income over total income
Family X_1													
Family X_2													
Family X_3													

Source: INE, 2016:9

The algorithm used to obtain the clusters is Ward's method, available in the SAS programme. The results of the cluster analysis allow for the identification of family groups with similar socioeconomic characteristics. Maximum homogeneity is sought within each sub-stratum so as to facilitate the accuracy of the estimates (the lower the variability, the narrower the confidence intervals for each one).

The next question regards the number of families to be chosen in each sub-stratum. The answer to this question leads us to review calculation

(4) This analysis does not apply in Strata 7, 8 and 9; in the APS it is accounted for by considering that they share the same characteristics in relation to the study variables and, therefore, are *a priori* homogeneous.

(5) The information used is taken from the 2011 Census and the Spanish State Tax Administration Agency (AEAT in the Spanish acronym).

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procedure for the sample size, a size which is established according to the minimum variance procedure for fixed cost (INE, 2016:11). This calculation is done based on the following cost function (Image III):

IMAGE III. Cost function

$$Q = n\,Q_S + n\,m\,Q_V \quad \text{con} \quad Q_S = Q_F + d\,Q_D$$

Where:

Q = **Total budget**

Q_S = **Cost per primary unit (section)**

Q_V = **Cost per last unit (household)**

n = **Number of sections**

m = **Number of households per section**

Q_F = **Fixed cost per section**

Q_D = **Daily cost of field work**

d = **Number of days necessary for field work**

Source: INE. 2016:11

But how is the sample size chosen in each sub-stratum? How many families in each sub-stratum are chosen for data collection?

All the variables that make up this function are known because of the economic budget established, except for m and n. To determine their value, the minimization of the coefficient of variation function is used, obtaining values of m=20 and n=3,000 according to the budget available.

Therefore, we are working with the 3,000 sub-strata which we have obtained via the cluster analysis and, within each of these, 20 families are chosen at random.

Obtaining responses

The APS is carried out six times for each family unit and collects information from all its members. The first interview is conducted by means of a computer-aided personal visit. Starting in 2005, the second and subsequent interviews are carried out by means of a computer-aided telephone call (INE, 2017).

These interview support systems introduce certain advantages in the processing and analysis of information, increasing the speed of the process of obtaining, recording and encoding the data (García López, González Carmona and Maldonado Jurado, 1999). The incorporation of filters in the survey itself aims to improve the reliability of the data as a whole by means of automated conditional flows or response validators based on the previous ones (Perea Yustres, 2007).

If the members of a family unit are present, it should be those people who respond to the survey for themselves. However, the procedure accepts hetero-informed surveys whenever the respondent is of legal age.

Based on this initial knowledge of the concept, the operationalization of ELET and the procedure for data collection, we return to the objective of our study. We will analyze how measurement of ELET by means of the APS is carried out in practice, specifically examining the implications which arise from the selection of respondents and the means of obtaining their responses.

Method

In order to achieve our research objective, we mainly used the APS databases corresponding to 2018. APS microdata can be downloaded from the INE's own website. However, they are grouped by age intervals ([16-20], [20-24]), and do not respond to the sections which define ELET. To overcome this problem, we requested, upon payment, the standard anonymized microdata, which allows us to avail of the information of the variable as a direct score.

The microdata allow us to carry out an analysis based on the following pertinent aspects in order to critically assess how ELET is measured:

- Sample size at national level and by autonomous region. To establish an assessment of the sample size at regional level, we take into account the information provided in the censuses in each region. Establishing a confidence level of 95%, the implications derived from the estimation error and the probabilities of p and q will be assessed using calculation simulations based on the simple random sampling formula.
- Percentage of agreement in the responses depending on whether or not it is the same respondent who provides them at different times.

Results

Sample size analysis

The analysis of the sufficiency of the sample, both at national and regional level, leads us to propose the estimate of the number of respondents needed according to the population surveyed. Following the function which allows the sample size to be calculated according to the simple random procedure, since it is the one which provides the most control, we calculated the sample size required in each autonomous region, setting an estimation error of 3 and a confidence level of 95%, accounting for two different assumptions: p and q with known data, p and q equal to 0.5.

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{e^2 \cdot (N-1) + z^2 \cdot p \cdot q}$$

n: theoretical sample size
z: confidence level
p: probability for
q: probability against
N: total population (people surveyed aged from 18 to 24)
e: estimation error

Taking into account the data obtained via the APS for p and q in each autonomous region and city, Table IV is created:

TABLE IV. Difference between APS and theoretical sample size (p and q according to APS data)

Region	p	q	No. of persons between 18 and 24 years old			
			Census	APS Sample	Theoretical sample size	Difference between APS and theoretical sample size
Andalusia	21,9	78,1	621.768	1.962	729	1.233
Aragon	15,8	84,2	84.576	436	564	-128
Asturias	12,6	87,4	53.364	231	466	-235
Balearic Islands	24,4	75,6	79.942	300	780	-480
Canary Islands	20,9	79,1	157.583	507	703	-196
Cantabria	9,8	90,2	33.455	223	373	-150
Castilla y León	13,9	86,1	143.164	967	509	458
Castilla-La Mancha	20,5	79,5	147.257	846	692	154
Catalonia	17	83	517.023	1.081	602	479
Valencia	20,2	79,8	336.802	830	687	143
Extremadura	20,9	79,1	156.970	401	702	-301
Galicia	14,3	85,7	152.204	1.009	521	488
Madrid	14,4	85,6	505.639	596	526	70
Murcia	24,1	75,9	54.717	434	770	-336
Navarra	11,4	88,6	43.248	244	427	-183
Basque Country	6,9	93,1	129.888	447	274	173
La Rioja	17,1	82,9	20.246	173	588	-415
Ceuta	23,4	76,6	8.203	73	700	-627
Melilla	29,5	70,5	7.958	61	799	-738
SPAIN	17,9	82,1	3.254.007	10.821	627	10.194

Source: Compiled by author based on 2018 APS microdata and 2018 census data

The sample size obtained in this case presents highly significant differences in a large number of the autonomous regions and cities. It must be pointed out that the value of the parameters p and q are in turn taken from the results provided by the APS itself for each autonomous region and city, so the estimate cannot be conclusive as it introduces in its calculation data the value of which we are querying.

Diagram I below presents these differences in a more visual manner. The autonomous regions where the sample estimated in order to analyze ELET is exceeded are represented in cool tones, while others where the expected minimum size is not reached are indicated in warm tones. The intensity of the tones indicates the greater or lesser difference between the value obtained by applying random sampling and that provided by the APS itself.

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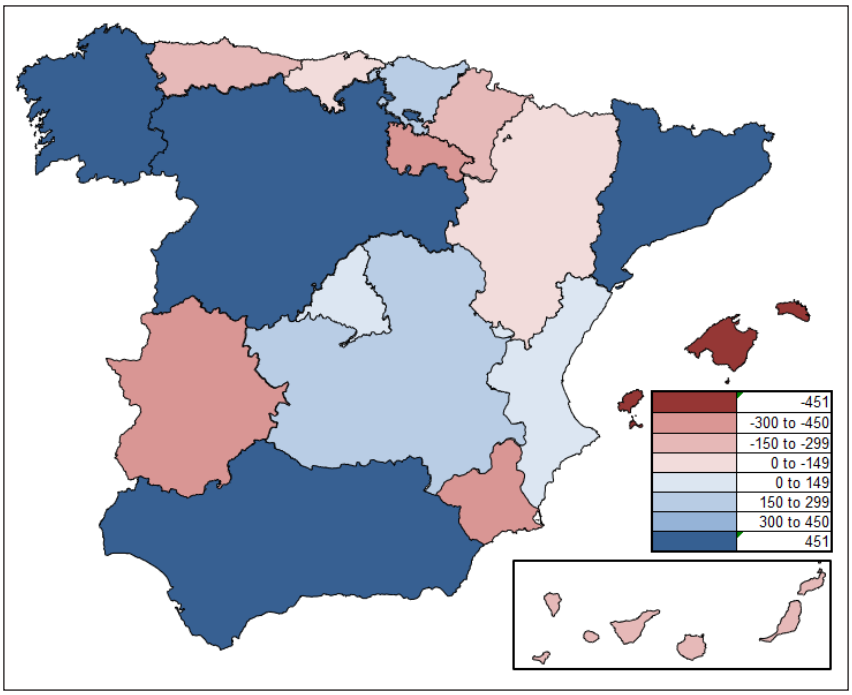
DIAGRAM I. Sampling differences (p and q according to APS data)



Source: Compiled by author

The second premise which is observed in Table V establishes a higher level of exigence when setting the equality of parameters p = q = 0.5, that is, it is based on the absence of knowledge of these data.

This premise should remain part of the initial hypothesis in any study that seeks to analyze ELET without taking previous indicators into account. If the percentage of ELET in each autonomous region is being queried, consequently, such information cannot be used to establish the p and q values. Hence, initial knowledge is not an appropriate frame of reference and the higher level of exigence is chosen, which is that which establishes equality of probabilities.

TABLE V. Difference between APS and theoretical sample size (p=q=0.5)

Region	p	q	Number of persons between 18 and 24 years old			
			Census	APS Sample	Theoretical sample size	Difference between APS and theoretical sample size
Andalusia	0,5	0,5	621.768	1.962	1.065	897
Aragon	0,5	0,5	84.576	436	1.054	-618
Asturias	0,5	0,5	53.364	231	1.046	-815
Balearic Islands	0,5	0,5	79.942	300	1.053	-753
Canary Islands	0,5	0,5	157.583	507	1.060	-553
Cantabria	0,5	0,5	33.455	223	1.034	-811
Castilla y León	0,5	0,5	143.164	967	1.059	-92
Castilla-La Mancha	0,5	0,5	147.257	846	1.059	-213
Catalonia	0,5	0,5	517.023	1.081	1.065	16
Valencia	0,5	0,5	336.802	830	1.064	-234
Extremadura	0,5	0,5	156.970	401	1.060	-659
Galicia	0,5	0,5	152.204	1.009	1.060	-51
Madrid	0,5	0,5	505.639	596	1.065	-469
Murcia	0,5	0,5	54.717	434	1.047	-613
Navarra	0,5	0,5	43.248	244	1.041	-797
Basque Country	0,5	0,5	129.888	447	1.058	-611
La Rioja	0,5	0,5	20.246	173	1.014	-841
Ceuta	0,5	0,5	8.203	73	944	-871
Melilla	0,5	0,5	7.958	61	941	-880
SPAIN	0,5	0,5	3.254.007	10.821	1.067	9.754

Source: Compiled by author based on 2018 EPA microdata and 2018 census data

In this case, all the autonomous regions and cities, except for Andalusia and Catalonia, present significantly smaller sample sizes than those used by the APS. Diagram II shows the sampling differences indicated.

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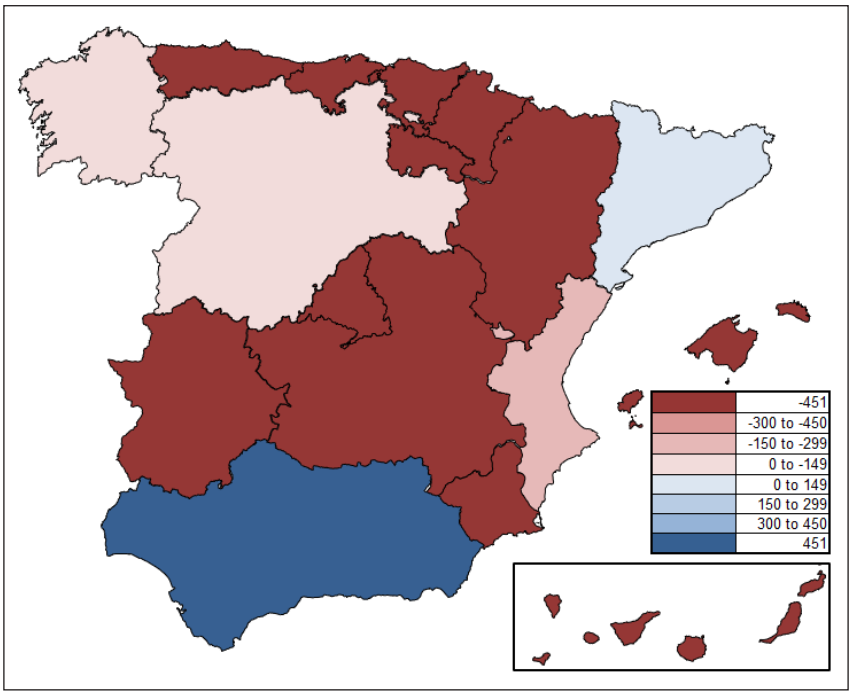
DIAGRAM II. Sampling differences (p=q=0.5)



Source: Compiled by author.

In its results, the APS itself warns about the caution necessary when interpreting the results at regional level: *"the data must be treated with caution, since the derivatives of small sample sizes are affected by strong sampling errors."* (APS, 2005). This is because it is a sample the sufficiency of which is accounted for only at national level. The greater the level of disaggregation of the results, the greater the sampling error, as we can see in Table VI below, obtained from the INE:

TABLE VI. Relative sampling errors

AUTONOMOUS REGION	Estimation of the % of young people aged between 18-24 with early school leaving	CV of the % of young people aged between 18-24 with early school leaving (2016 average)	Confidence interval Lower limit	Confidence interval Upper limit
National Total	**19.0%**	**2.5%**	**18.1%**	**19.9%**
Andalusia	23.1%	4.3%	21.1%	25.1%
Aragon	19.1%	10.4%	15.2%	23.0%
Asturias	16.6%	16.7%	11.1%	22.0%
Balearic Islands	26.8%	8.2%	22.5%	31.1%
Canary Islands	18.9%	8.6%	15.7%	22.0%
Cantabria	8.6%	23.3%	4.6%	12.5%
Castilla y León	17.3%	9.8%	14.0%	20.6%
Castilla-La Mancha	23.2%	7.3%	19.9%	26.6%
Catalonia	18.0%	5.1%	16.2%	19.8%
Valencia	20.2%	7.8%	17.1%	23.3%
Extremadura	20.4%	9.2%	16.8%	24.1%
Galicia	15.2%	5.9%	13.4%	17.0%
Madrid	14.6%	12.9%	10.9%	18.3%
Murcia	26.4%	10.4%	21.1%	31.8%
Navarra	13.4%	17.8%	8.7%	18.1%
Basque Country	7.9%	14.7%	5.6%	10.2%
La Rioja	17.8%	16.2%	12.1%	23.4%
Ceuta y Melilla	23.1%	17.0%	15.4%	30.8%

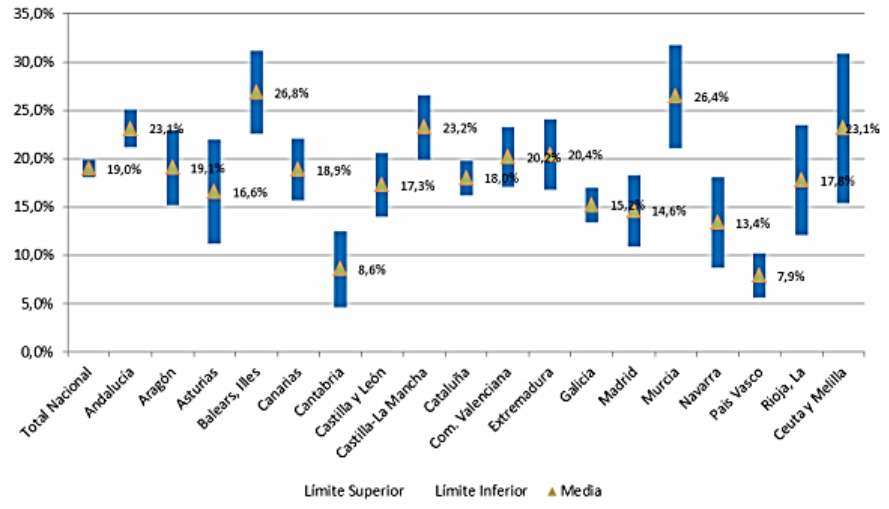
Notes:

- The sampling errors give us a rough idea of the reliability of the various estimates which are obtained based on a survey. In general, the greater the disaggregation of the figures, the greater the sampling error obtained and, therefore, the the accuracy of the estimate is lesser.
- Based on the estimate and its sampling error, confidence intervals can be constructed in which the parameter to be estimated is found with a certain probability.

Source: INE, MECD, methodological notes (2016)

In order that the confidence interval indicated in Table IV can be visualized more easily, Figure II is presented below.

FIGURE II. Estimated percentage of school leaving



Source: Compiled by author

If we look at the estimate of school leaving within its confidence interval for the case of Navarra, we find that ELET in this community has a value of between 8.7% and 18.1%.

If we consider that one of the autonomous regions with the highest ELET index is Andalusia (Table VI), which is, incidentally, the most surveyed, the national ELET index is affected by its greater representation. The fact that it is the most surveyed could be accounted for by the fact that it is the region with the largest number of people between 18 and 24 years old, but the same does not occur with certain regions such as Aragon, Catalonia, Valencia or Madrid.

TABLE VI. Proportion of people aged 18 to 24 at national level by region (ordered from highest to lowest according to % of sampling)

Region	% used for national total sampling	% of people aged 18 to 24 at national level
Andalusia	18,1	19,11
Aragon	10,0	2,60
Asturias	9,3	1,64
Balearic Islands	8,9	2,46
Canary Islands	7,8	4,84
Cantabria	7,7	1,03
Castilla y León	5,5	4,40
Castilla-La Mancha	4,7	4,53
Catalonia	4,1	15,89
Valencia	4,0	10,35
Extremadura	4,0	4,82
Galicia	3,7	4,68
Madrid	2,8	15,54
Murcia	2,3	1,68
Navarra	2,1	1,33
Basque Country	2,1	3,99
La Rioja	1,6	0,62
Ceuta	0,7	0,25
Melilla	0,6	0,24
TOTAL	100	100

Source: Compiled by author

Analysis of the percentage of agreement according to variation or repetition of the respondent

As we have indicated, the fact that the APS is repeated over the course of the different quarters and that it can be answered by a respondent who, in addition to acting as a spokesperson for the family unit, may vary from one application to another, means there is a greater possibility for error in these hetero-informed surveys. Figure III below presents

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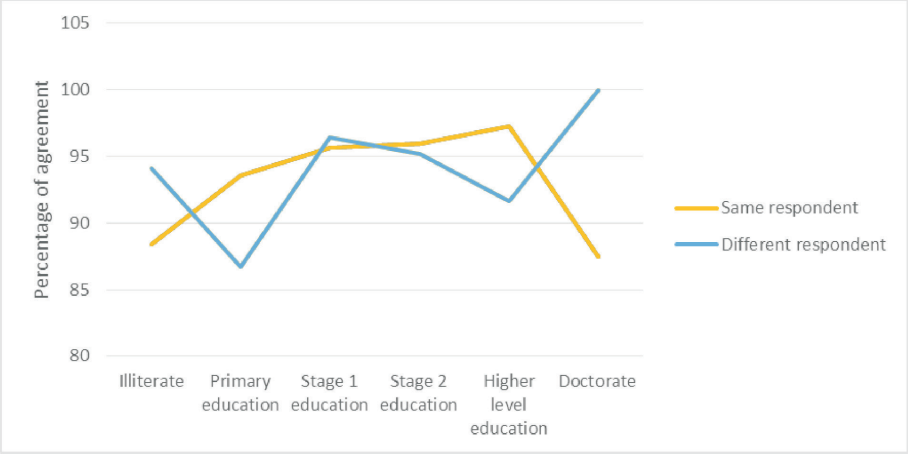
an example of these differences, referring to the response regarding level of education. The percentage of agreement is calculated following the model developed by Hansen, Hurwitz and Bershad for the United States Census Bureau (INE, 2012b:30), by means of which they select a subsample to which the survey is applied at two successive points in order to study potential biases and errors other than sampling:

FIGURE III. Percentage of agreement depending on consistency of respondent



Source: Compiled by author based on the INE-2012a:78 report.

The report itself acknowledges that results improve when the same person responds to the survey in successive applications. However, in the specific case which we have used as an example regarding education level, a certain degree of inconsistency with what the report indicates with regard to respondent consistency is revealed. As we can see, the percentage of agreement in order to identify "illiterate people", members who are in "primary education" or members with "doctorates" within the household is higher in situations where the respondent varies from one application to another. This reduces confidence in the answers and raises questions with regard to the accuracy of the data.

Discussion of the results

To begin the discussion of the results, certain issues related to the construct validity of the survey must first be looked at. The manner in which ELET is operationalized creates certain initial dilemmas with regard to the variables involved. Categorization as early school leaving is determined by a set of particular characteristics which are not easy to identify based on the mere definition of the concept. To begin the discussion, the following hypothetical situations are proposed:

- The variability of the responses depending on when the survey is carried out: a person of 20 years of age does not finish ESO (Compulsory Secondary Education) Level 3 and enrols in a beginner's English course at a language centre; at certain points they will be classed as ELET and at others they will not, depending on when the EPA is conducted. Before doing the course, this person will have been categorized as ELET, during the course they are not and, once the course is finished, they are once more. Whether they are considered to be ELET will depend on the point in time.
- The variability in the computation when dealing with the same type of course: two people with the same educational level, for example ESO Level 2, and with the same age, 22, are preparing for level E public examinations. One of them is attending an academy and the other is studying independently from home. The former will not be classed as ELET while the latter will.
- The limits in the recognition of certain forms of training: a 19-year-old person who has not completed ESO Level 3 is taking a course so as to obtain a particular professional certificate, which qualifies you to conduct a particular professional activity. Upon successful completion, they will have obtained certification for employment, but they will not have academic recognition, that is, they would not have graduated from secondary school. As Calvo Bayón (2016) points out, unregulated training is not recognized as an official educational qualification; those who undertake unregulated training of some kind shall still, at the end of this course, be deemed ELET.
- The age limit of 24 as a measurement criterion for ELET: a person who is 24 years old and who completes the survey in the year in which they will turn 25 shall no longer be deemed ELET when they turn 25.

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Through these situations we can see that the computation of ELET is subject to a certain arbitrariness, in the sense that the same person can "enter and exit the statistics" for reasons which are, at least, debatable.

Meanwhile, regarding sampling, taking into account the procedure followed for the selection of respondents and the determination of the size, a number of questions arise which could lead to a debate on the suitability of said procedure for the study of ELET.

We consider that the socio-economic variables which are proposed in order to establish the clusters are selected by virtue of their correlation with the APS study objective: to map the Spanish population in relation to the labour market (employed, active, unemployed and inactive). However, the continuation of and disengagement from studies is not explained by the same variables. Characteristics such as rurality (different in the north and south), proximity to public institutions and ease of access thereto, proximity to university cities, ease of access to the labour market (Santamaría Luna, 2015; Holgueras González, 2016; Martínez-Novillo, 2017), for example, are data which, though they facilitate the explanation concerning differences in the early leaving rate, are not considered in the formation of the clusters.

Another point in relation to the clusters is that we can see that in the auxiliary variables the percentage of people per household who are between 15 and 24 years old is taken into account. This interval does not correspond to the 18-24 set in the definition of ELET itself, thus we observe a lack of precision in these initial analyses which would allow the profiles of the families to be interviewed to be established.

With regard to the results, the calculation of the sample by means of the simple random method has shown the insufficiency of the sample size in each of the autonomous regions in the two cases proposed: one, where p and q take the reference values of ELET at regional level, and a second in which we establish p as equal to q. The first assumption introduces into the calculation itself the value of ELET which is being queried; therefore, the calculation is explained based on the equality of parameters which indicates the same probability of leaving school early or continuing studying. This assumption should not be discarded as a null hypothesis in a first estimate of early leaving since this decision refers to a post-compulsory stage. If we did not consider any prior information, the probability of leaving early or continuing would be the same.

The difference in the theoretical sample size between the first case and the second is 8,377 people in total, that is, 0.26% of the population surveyed between 18 and 24 years old. Even considering the strict requirement of assuming the equality of p and q, in practice it would only entail a moderate increase in the participation of people in this age segment.

The decision as to how many people will be interviewed per region is made based on the cost carrying out the APS involves in certain geographic areas. Cost is prioritized and the sampling achieved is accounted for at state level, but the same does not happen at regional level. The interpretation of ELET data in the different regions is not an objective established in the APS itself. The problem, therefore, lies in the inappropriate use of the information, both by the educational administration and by the academy, which takes as valid a general indicator in order to provide information segmented by region. For budgetary reasons, more surveying may be conducted in some regions than in others without affecting the coefficient of variation set at national level. However, if this is the case, we would be introducing a strong bias at regional level and, consequently, the interpretation of these results could not be conclusive, as occurs at present.

The consequence of this lack of precision in the measuring of ELET at regional level affects the interpretation of the results. Although in the official reports the percentage of ELET per region is taken as a conclusive value, it is established within a confidence interval defined by the coefficient of variation (CV). In the case of Navarra, it is ascertained that its Coefficient of Variation is one of the highest (17.8%), second only to Cantabria (23.3%). A CV of 17.8% indicates that there are the same probabilities that ELET in Navarra is 13.4%, as it is a value which is between 8.7% (lower limit) and 18.1% (upper limit).

Meanwhile, to determine the ELET indicator at national level, the proportion of people censused between 18 and 24 years old which each of the regions contributes is not taken into account, thus producing a bias in the interpretation of the total computation of early leaving. Regions such as Madrid and Catalonia are underrepresented, while others such as Aragon and Asturias are overrepresented.

Lastly, the analysis of how responses are obtained suggests certain points which are worthy of reflection. The APS, as a hetero-informed survey, allows certain people to answer for others. In addition, questions

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related to education levels may elicit uncertainty and a certain degree of imprecision in the answer. It can be easier to find out what job a person has than their level of education, which is an added shortcoming in measuring early school leaving.

Conclusions

The analysis provided regarding the definition and measuring of ELET allows us to advance conclusions with regard to critical issues related to the concept itself, its focus and the desire to quantify it.

Both the media and politicians themselves have an impact as regards the progressive improvement of the percentage of ELET, and it is indisputable that ELET is an important issue in the education system and policies. Arriving at a figure for ELET would allow us to gain insight into the health of the educational system and help us when it comes to comparing achievements in the different education systems. The problem lies in the manner in which the data from the different regions is used and relayed. The limitations which the INE recognizes regarding the representativeness of the sample at regional level are not disclosed in the media or by political decision-makers, which have such a significant impact on the formation of the pedagogical and social imaginary. Addressing it entails, as a first step, recognizing it, that is, knowing if it is happening, where, who…

Based on the reflection engaged in concerning measuring early school leaving by means of the APS, our proposed measure is in keeping with the position of Calvo Bayón (2016); his thesis is based on the criticisms presented by Fernández Macías, Muñoz de Bustillo Llorente, Braña Pino and Antón Pérez (2010) and the report carried out by the GHK (2005), which highlights the issues relating to precision which arise from working with sample data instead of being able to use census data. As an alternative, we approve of the idea of having individualized school records which contain students' academic history: levels, pathways, booster classes and/or individual support, repeats, absenteeism, results achieved. Each student would have a school ID assigned to them permanently, regardless of where they were studying. This information would have two uses which are of particular relevance: at school level, it would facilitate a diagnostic and evaluative function

based on the consideration of pedagogical variables; more generally, it would also make it possible to obtain the percentage of early school leaving at national level and by region. In a complementary fashion, this system would have the additional advantage of allowing us to analyze the information at key moments of the school year: start date, quarterly and/or final evaluations.

Indeed, one of the limitations of this study relates to the inability to access school records referring to at least one region, which would have allowed us to compare the differences between a percentage obtained by sampling and another which addresses the reality of the results.

Another - even more controversial – matter involves thinking about the meaning and implications of ELET. On the one hand, it seems important to us to emphasize that the current manner in which ELET is conceptualized and measured includes training options outside the scholastic. Thus, two key ideas are reinforced: one, it shows that there are many different educational settings; two, it reinforces the necessary connections between formal and non-formal education which our current situation requires.

We need to analyze what happens, what they do or cease doing, both in the educational system and in the training provided through employment, to account for the fact that educational success is not something which is achieved by all students. Instead, a discourse permeates which accounts for the inequality of achievements by virtue of a hypothetical level of exigence imposed as a selection filter: quality is explained because there is exclusion.

The fact that there is school failure and early leaving, regarded as problems, is naturalized… problems for whom and for what? If this is not analyzed, the continuation of the discourse installs the consequences of ELET in the imaginary of fear: "Early school leaving constitutes an obstacle to economic growth and employment, since it hinders productivity and competitiveness and exacerbates poverty and social exclusion" (European Commission, 2017:1).

Broadly speaking, this is the dominant rationale based on which the ELET question is approached: it is a problem and its consequences go beyond schooling, which justifies devising policies and measures for its reduction, although an in-depth reflection has not been pursued which points to the meaning of educational achievements and the need to address the necessary changes from a comprehensive perspective which

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caters to the particular experiences of people labelled as early school leavers.

Thus, rather than understanding why it occurs and how it can be prevented, the idea of making progress with it is promoted, even without re-establishing the meaning and purpose of education. Hence the desire to quantify it and, to a certain extent, approach it from a perspective of economism which links with the APS as an instrument for collecting information.

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Detecting emerging research fronts in education from scientific journals indexed in the Journal Citation Reports: an international perspective

Detección de frentes emergentes de investigación en educación a partir de revistas científicas indexadas en los Journal Citation Reports: una perspectiva internacional

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Abstract

Introduction: This paper identifies emergent fronts of research in education through a study of the best-ranked scientific journals in the area. Methodology: We propose a multivariate methodology that incorporates the most widely used, efficient and representative citation indicators. A descriptive observational evaluative design has been followed with a sample of the 230 journals under the thematic category "Education & Educational Research" of JCR 2015. We have used eight evaluative indicators to assess them: impact factor, immediacy index, *h* index from Web of Science, *h* index from Scimago, *h* index from Google Scholar, Scimago Journal Rank, Altmetric scores for three months, and Altmetric scores at any time. Results: Our results show that the journals considered can be classified into five clusters according to their evaluative quality, of which we have considered only the three clusters best configured as representative, which allows inferring up to ten emerging fronts of generic research that show two types of impact: scientific and social. Discussion: It is possible to evaluate scientific journals from the factorial scores generated by a general factor of each journal. A conglomerate analysis allows the classification of journals according to their

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evaluative quality and inferring from their titles and editorial lines the hottest and most interesting topics, that is, emerging research fronts.

Key words: Emerging fronts, educational research, journal evaluation, citation analysis, metadata, Journal Citation Reports, multivariate analysis

Resumen

Introducción: Este artículo identifica frentes emergentes de investigación en educación a través del estudio de las revistas científicas mejor calificadas en el área. Metodología: Proponemos una metodología multivariada que incorpora los indicadores de productividad y citación más utilizados, eficientes y representativos. Se ha seguido un diseño evaluativo descriptivo con una muestra de las 230 revistas indexadas en la categoría temática "Education & Educational Research" de los JCRs 2015. Para generar un metadato evaluativo de cada revista se han empleado ocho indicadores de citación: factor de impacto, índice de inmediatez, índice *h* de Web of Science, índice *h* de Scimago, índice *h* de Google Scholar, Scimago Journal Rank, puntajes Altmetric a tres meses y puntajes Altmetric a cualquier momento (*any time*). Resultados: Los resultados muestran que las revistas consideradas se clasifican en cinco clusters según su calidad evaluativa. Seleccionando sólo los tres conglomerados mejor configurados como representativos y analizando el contenido de los títulos y las líneas editoriales de cada revista se pueden inferir diez frentes emergentes de investigación genéricos que manifiestan dos tipos de impacto: científico y social. Discusión: Es posible evaluar revistas científicas a partir de las puntuaciones factoriales generadas por un factor general de cada revista. Un análisis de conglomerados permite clasificar las revistas de acuerdo a su calidad evaluativa e inferir de sus títulos y líneas editoriales los temas más candentes y de mayor interés, es decir, frentes emergentes de investigación.

Palabras clave: Frentes emergentes, investigación educativa, evaluación de revistas, análisis de citación, metadatos, Journal Citation Reports, análisis multivariado

Introduction

Identifying research trends, in our case in educative research, is of paramount importance to observe the changes in research activity and identify the focus of attention that attracts researchers. It is important to consider what is happening at present to predict what will occur in the future. Provided the relevant growth experimented by current study fields and

scientific literature, new topics could be foreseen studying a group of key documents. Furthermore, the detection of emerging fronts is of great interest for the evaluation of research (Garfield, 1994), especially when following research trends has always been a great concert for science and technology policy makers, whose responsibility is to assign human and financial resources to formulate policies in their respective fields of study (Tseng, Lin, Lee, Hung and Lee, 2009).

Concept and characteristics of emergent research fronts

Emergent research fronts are the most dynamic fields of study in science and technology and thus receive the most scientific and social interest (Upham and Small, 2010). They also serve as crucial indicators to formulate governmental policies related to technology (Huang and Chang, 2016). This convergence taking place in the strat of the research front, attracts the interest of more scientists establishing social links between them that subsequently generates more findings. We conceptualize the term as explained by Shibata, Kajikawa, Takeda and Matsushima (2008), who indicate that a research front in a certain field of study refers to the body of papers that scientists cite actively.

The identification of emergent research fronts presents a special complexity. A front is characterized because inside it, there is abundant research (productivity) that is highly cited (impact) in a short time lapse (immediacy). Consequently, the areas of scientific research that generate great interest for other researchers tend to be perceived as more promising, they usually are well financed by organisms and the probability that their discoveries are more commercial increases considerably (Upham and Small, 2010). As topics of great interest, they denote a change in the focus of research efforts. As research fronts have the potential to pervade several disciplines, they defy the existing models and anticipate possible changes in the paradigm that have the potential to initiative a scientific revolution (Kuhn, 1962).

Knowing and defining research fronts is an increasing concern of the scientific community in every discipline. This shows in the interest to produce annual reports developed by diverse academic institutions and information companies, identifying all scientific research fronts (Institutes of Science and Development, Chinese Academy of Sciences, The National

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Science Library, Chinese Academy of Sciences and Clarivate Analytics, 2016; Institutes of Science and Development, Chinese Academy of Sciences, The National Science Library, Chinese Academy of Sciences and Clarivate Analytics, 2017; King and Pendlebury, 2013; The National Science Library, Chinese Academy of Sciences and Thomson Reuters, 2014). These catalogues show clearly how research trends vary over time.

Despite the extensive number of reports about research fronts in the most varied disciplines, there is a lack of detailed reports in the area of education. This will be the rationale of the present study.

The most prestigious and most cited scientific journals act as epistemic *lobbies* that orientate research in the themes that they propose. Without doubt, their title and editorial lines constitute main topics that can translate into priority fronts for research and favour the publication of related research papers.

Scientific research based on academic journals

Journals are immersed in a permanent process of construction and communication through their committees and reviewers, who select those pieces of work that respond to certain quality standards and scientific rigor, with the aim that the publication obtains an amplified scientific impact (Aliaga and Suárez-Rodríguez, 2008; Diestro Fernández, Ruiz-Corbella and Galán, 2017) and to recognize researchers for their contributions to scientific progress (Haba-Osca, González-Sala and Osca-Lluch, 2019). In 1970, Zwemer defined the desirable characteristics of a "good journal" emphasizing having a high citation rate. This was used by Garfield (2006) to instrumentalize his ubiquitous and omnipresent Impact Factor (IF). However, it is necessary to clarify that citation analysis is not the only evaluative modality for journals. There exist other evaluative modalities such as reputation or prestige inferred from studies with surveys of experts (Fernández-Cano and Bueno Sánchez, 2002; Saarela, Karkkainen, Lahtonen and Rossi, 2016) or SWOT analysis (Aliaga, Gutiérrez-Braojos and Fernández-Cano, 2018). Nevertheless, we must recognize that citation analysis still is the most widely accepted and adopted evaluative modality, and thus more valid for the evaluation of scientific journals, as long as it is used effectively and responsibly, as advised by van Raan (2010) and was early proposed by Garfield (1972).

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On the other hand, librarians, scientists, editors, research institutions and governments have a huge interest in journal evaluations (Rousseau, 2002). Librarians are interested in evaluations that can guide them in the selection of sources and also in the ratio impact/price. Scientists want to find the journal most closely related to their research to publish their results. The objective of financing organisms and governments is that their beneficiaries publish in the most prestigious journals. Editors establish links between higher citation punctuations and a success in the editorial policy and practice, this hides behind the obsession to be placed in the first quartile (Q1). Scientometrists want to evaluate science, their agents and realizations. Methodologists use them to verify whether scientific research methods are applied appropriately. Lastly, research councils use the impact factor of the journals as elements in the evaluative studies of local research with the aim of broadening the visibility of academic research, as this may bring recognition and attract resources (Docampo, 2008).

Scientometric methodologies to determine emergent research fronts

To correctly determine an emergent research front, it is necessary to delimit the scientific field under study. To this aim, there exist a wide variety of methods and analyses to establish and visualize the hot topics in a certain discipline.

According to Garfield (1994), research fronts are sub-specialties or topics: complex keywords that can be identified grouping shared citations; that is, following the methodology of co-citation analysis proposed by Small (1973) and Small and Crane (1979). Such sub-specialties may vary according to the size of the frequency thresholds employed for co-citations. These can be defined as the number of times two documents are cited together by others. Small would recognize posteriorly and emphasize the potentially of co-citation studies to detect research fronts (Upham and Small, 2010).

Nevertheless, there are studies like the current one that employ a methodology based on the use of diverse indicators to complete a multivariate analysis (generating metadata for each journal), to evaluate and classify journals and/or papers (Ennas, Biggio and Di Guardo, 2015; Fernández-Cano and Fernández-Guerrero, 2017), so that they can facilitate the detection of the topics that generate most interest among researchers and professionals.

Method

A variety of methods can be used for the detection of fronts, from co-citation analysis to verbal and co-occurrence analysis, expert judgement through simple surveys or with DELPHI surveys. We propose a novel method to infer fronts by means of an evaluative study of the scientific journals in combination with the analysis of content.

The design of the study can be contextualized as a quantitative research eminently descriptive due to the nature of the data and analysis techniques employed. A descriptive and explicative method has been used, for this is a study that describes quantitatively a sample through multiple variables related to scientific production and journal citation.

Sample

In our research, population and sample are coincident as they are comprised of the scientific journals indexed in JCR in 2015, under the thematic category *Education & Educational Research*. The JCR database was queried as the source for scientific journals. The search sequence is:

– Selection of the category *Education & Educational Research*, year 2015, and edition SSCI.

Starting with a universe of all journals indexed in JCR, the present study uses a census non-probabilistic sampling of deliberative nature. Thus, population and sample coincide being comprised of 230 scientific journals in the *Education & Educational Research* thematic category.

Furthermore, the web sites of each journal are also secondary sources that add some basic information about the research lines proposed in the journals considered.

Traditionally, the most widely adopted form to evaluate scientific activity has been through bibliometric indicators (De Filippo, Pandiella-Dominique and Sanz-Casado, 2017). Provided the abundance of citation indicators available, we have considered only the eight most used, efficient and representative indicators. We understand by efficient indicator the one that the scientific community assumes to represent the construct "quality of the journal" and with the lowest cost for its generation; an efficient evaluative indicator is able to evaluate minimizing the resources needed for its generation, and it should be widely available. Similarly, a

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representative indicator could be the one that the scientific community assumes as representing the construct "quality of the journal" and used by the community with that aim (Gauffriau, 2017; Ioannidis, Klavans and Boyack, 2016; Leydesdorff, 2008).

For scientific journals, the scientometric variables employed are those corresponding to the scope of the different databases according to their availability.

TABLE I. Scientometric variables considered in this study

Variables	Scope	Variable type
Impact factor (IF)	InCites (JCRs)	Citation/production
Immediacy index (II)	InCites (JCRs)	Citation/production
h index SSCI	Web of Science	Citation/production
SJR score	SCImago Journal Rank (Scopus)	Citation/production
h index SCImago	SCImago Journal Rank (Scopus)	Citation/production
*h*5 index Google	Google Scholar Metrics	Citation/production
Altmetric total score (*any time* – last two years)	Altmetric	Citation
Altmetric total score (last three months)	Altmetric	Citation

Instruments

All the information obtained from JCR about the journals was stored in a matrix in *Microsoft Office Excel 2013* that contained the data related to the eight bibliometric indicators mentioned in Table 1. For the analysis of the data we have used SPSS v.24.

The instrument employed for data collection from the scientific journals is considered valid and reliable because we have used it successfully in our previous research (Curiel-Marín and Fernández-Cano, 2015; Úbeda-Sánchez, Fernández-Cano and Callejas, 2019) and thus it adjusts to the so-called *usage validity*, which considers that the reiterated used of an instrument is a key validity modality when there is no evident conflict between observation and reality (Zeller, 1997).

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The reliability in the search of the data is proved by our previous experience in pieces of work of a similar nature and their periodic review by ourselves and the experts in different knowledge areas.

Procedure

For the analysis performed we have employed the software SPSS v.24. The analytic techniques employed were two coefficients of ordinal correlations (Kendall's τ_b and Spearman's ρ), Cronbach's alpha, principal factors factorial analysis and cluster analysis using Ward linkage clustering methods and squared Euclidean distance with standardized Z punctuations, until we obtained the most interpretable solution.

It is important to highlight that the limitation of differential weight assignment to each indicator is attenuated by its transformation into a normalized or typified punctuation. This makes it possible to use parametric statistics (Ennas et al., 2015).

The techniques used in this study are bivariate correlations, principal component analysis or exploratory factorial, cluster analysis and manifest content analysis or quantitative analysis.

Journals and papers metadata

Increasingly, to evaluate research using academic journals and papers, it is necessary to retrieve a data related to citation indicators, to posteriorly analyse them as a whole, obtaining as a result a group of metadata that allows to evaluate, and in our case also classify journals and papers. We understand as metadata those data that contain information about data, which are somehow aggregated (i.e. factorial punctuations of a multiple regression equation). Thus, we are referring to data mining process where information is extracted from a data set that is transformed into a more comprehensible structure.

We have employed this analysis technique and retrieved eight indicators (data /variables) for the scientific journals that constitute the sample of this study. The multivariate study of the eight indicators, allows to compute the metadata that facilitate the evaluation and classification of the journals attending to their quality and impact, by means of clustering techniques.

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Content analysis

According to López Noguero (2002), content analysis may be used, among other purposes, as an analysis and quantification technique for communication material, such as the content of scientific journals and papers based in paper titles and descriptors.

This type of analysis is used in this study to detect the research fronts from scientific journals and immediately after having performed the multivariate analysis with the data from the citation indicators. Once the journals have been classified, the main aspect for front detection is to identify their themes. In order to do so, we have performed a content analysis over the titles of the journals as well as the research lines provided by the publishers in the websites of the journals.

Results

Correlation analysis among indicators

Table 2 shows the bivariate correlations among indicators. They are double because they have been computed with two ordinal coefficients: Kendall's τ_b and Spearman's ρ. This time all show a high statistical significance ($p \leq .000$), which leads to a high co-linearity in the subsequent factorial analysis. Nevertheless, following Martínez Arias (1999) and Tabachnick and Fidell (2001), such co-linearity could be worrying, as it could bring instability to the factorial analysis if bivariate correlations reached values greater or equal to 0,90 and in smaller samples, with less than 10 elements. These weaknesses are not observed in our analysis.

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TABLE II. Values of the ordinal correlations among evaluative indicators and the factorial punctuation generated in the category Education & Educational Research

τ_b / ρ	I_I_JCR	*h*_SSCI	SJR	*h*_SCImago	*h*5_Google	Altmetric 2 years	Altmetric 3 months
IF_{2015}	0,396**/0,550**	0,436**/0,598**	0,625**/0,810**	0,484**/0,652**	0,392**/0,509**	0,383**/0,540**	0,366**/0,513**
I_I_JCR		0,275**/0,390**	0,344**/0,483**	0,291**/,0416**	0,190**/0,266**	0,236**/0,342**	0,221**/0,320**
***h*_SSCI**			0,465**/0,637**	0,727**/0,880**	0,467**/0,611**	0,370**/0,503**	0,337**/0,463**
SJR				0,530**/0,704**	0,376**/0,490**	0,358**/0,510**	0,343**/0,489**
***h*_SCImago**					0,507**/0,651**	0,428**/0,584**	0,391**/0,538**
***h*5_Google**						0,382**/0,522**	0,331**/0,455**
Altmetric 2 years							0,797**/0,940**

** The correlation is significant at level p ≤ .01 (bilateral).
* The correlation is significant at level p ≤ .05 (bilateral).

Reliability index

A multivariate reliability index is obtained by Cronbach's alpha based on typified data from the indicators, which value for this factorial space of eight indicators is 0,892 ($p \leq .000$); a very acceptable value due to its proximity to 1 and with statistical significance.

Factorial solution for indicators

The eight indicators considered undergo an exploratory factorial analysis by means of principal components with the aim of discerning the underlying structure of the construct "quality of the scientific journals of *Education & Educational Research*", searching for a common indicator or general factor.

Previously, it is determined whether the factorial analysis is pertinent with Bartlett's sphericity test, which evaluates the applicability over the variables/indicators under study. The model is significant if the null hypothesis (H_0) is accepted and in our case the analysis is applicable. For our data, the Bartlett's test show a value $\chi^2 = 1448{,}733$ for 28 degrees of freedom with $p \leq .000$; obviously we proceeded to perform the factorial analysis. In addition, the measure of sample adequacy of Kaiser-Meyer-Olkin shows a value of 0,797, a value close to 1 that indicates a medium factorial model provided the noticeable co-linearity among indicators (García Jiménez, Gil Flores and Rodríguez Gómez, 2000, p.75) and thus is acceptable. Table 3 shows the factorial solution.

TABLE III. Factorial solution with principal components for the eight evaluative indicators considered in the category Education & Educational Research

Indicators	Component 1*	Component 2*	Communality** h^2
IF_{2015}	0,801	0,370	0,779
I_I_JCR	0,517	0,516	0,533
***h*_SSCI**	0,832	0,127	0,708
SJR	0,780	0,374	0,748
***h*_SCImago**	0,907	0,063	0,827
***h*5_Google**	0,671	-0,351	0,572
Altmetric 2 years	0,776	-0,514	0,866
Altmetric 3 months	0,746	-0,514	0,821
Eigen-Value	4,640	1,214	
Explained variance	57,999%	15,176%	
Total variance explained		73,175%	

* Factor loadings (a) significant if a≥|.15|
** Ideal communality if h^2=1

The indicator *h*_SCImago is the best represented in the factorial solution with a value of 0,907, while the best explained variable by the communality factors is the 2 years Almetric, which shows a communality of 0,866. The signs obtained in the second component are significant: the five indicators of scientific impact show positive loadings while the negative loadings correspond to the three indicators of social impact. Thus, for the *Education & Educational Research* category, component 1 shows the general scientific impact, while component 2 is a differential factor of social impact, that is, academic journals where the impact derived from the web is not a priority.

A consequence of these results is the evaluative potentiality of the factorial punctuations derived (see the last two columns of Table 4). Factor 1 is a combined evaluative indicator or meta-index that represents a plausible evaluation of each journal as a typical or normalized punctuation

corresponding to the equation: ,801*IF_{2015} + ,517*I_I_JCR + 0,832**h*_SSCI + 0,780*SJR + 0,907**h*_SCImago + 0,671**h*5_Google + 0,776*Altmetric 2 years + 0,746*Altmetric 3 months. In the case of factor 2, the normalized punctuation follows the equation: 0,370*IF_{2015} + 0,516*I_I_JCR + 0,127**h*_SSCI + 0,374*SJR + 0,063**h*_SCImago - 0,351**h*5_Google - 0,514*Altmetric 2 years- 0,514*Altmetric 3 month. The values of the indicators in the equation for each journal are standardized subtracting their averages and dividing them by their standard deviations, and the numeric coefficients are the loadings (a) of the factorial solution.

Cluster analysis of the cases (journals) in the category Education & Educational Research

We have used cluster analysis in combination with Ward's method and quadratic Euclidean distance over the 230 journals that conform the category *Education & Educational Research*. As a result, the eight evaluation indicators classify scientific journals into five clusters of heterogeneous evaluative quality. These can be interpreted as excellent, outstanding, noteworthy, good and acceptable; considering distances, linkage and associated factorial punctuations.

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TABLA IV. Journals in the category Education & Educational Research that comprise the first four clusters presented by the value of their impact factor (IF) including their respective values and the other evaluative indicators considered

Journals	Codex	IF 2015	Immediacy index JCR	*h* index SSCI	SJR	*h* index SCImago	*h5* index Google	Altmetric total score (2 years – any time)	Altmetric total score (last 3 months)	General factorial score (GFS)	Specific factorial score (SFS)
Educational Psychologist	EDPSY	5,688	1,1	90	3,834	88	0	1196	579	3,169	4,150
Review of Educational Research	RER	5,235	0,75	137	3,449	103	0	2939	1322	4,173	1,388
Learning and Instruction	LEIN	3,692	0,548	64	2,851	73	48	782	114	2,161	1,689
Journal of Research in Science Teaching	JRST	3,052	0,746	85	3,797	88	42	1245	103	2,631	2,153
Educational Researcher	ER	3,049	0,905	35	3,088	57	45	4348	1300	3,281	-1,757
American Educational Research Journal	AERJ	2,924	0,472	108	3,879	83	41	2975	720	3,359	-0,131
Computers & Education	COMED	2,881	0,528	81	3,143	109	88	4862	2508	5,266	-5,243
Journal of Teacher Education	JOUTE	2,754	0,364	56	3,149	56	37	673	156	1,571	1,294
Scientific Studies of Reading	SCISR	2,745	0,643	39	2,7	39	22	259	88	1	2,195
Internet and Higher Education	IHE	2,719	0,706	25	3,561	54	44	690	180	1,630	1,656
Advances in Health Sciences Education	ADHSE	2,462	0,216	38	1,397	42	29	1205	262	0,910	-0,077
Academy of Management Learning & Education	AMLE	2,458	0,312	43	1,551	44	37	291	69	0,824	0,786
International Journal of Computer-Supported Collaborative Learning	IJCSCL	2,2	0,375	31	1,641	39	25	218	13	0,476	1,173

Journals	Codex	IF 2015	Immediacy index JCR	*h* index SSCI	SJR	*h* index SCImago	*h5* index Google	Altmetric total score (2 years – any time)	Altmetric total score (last 3 months)	General factorial score (GFS)	Specific factorial score (SFS)
Journal of Education Policy	JOUEP	2,174	0,341	38	2,356	52	26	977	170	1,043	0,729
Reading Research Quarterly	RRQ	2,087	0,391	85	1,768	62	28	273	59	1,213	1,343
Educational Evaluation and Policy Analysis	EEPA	2	0,184	53	3,078	55	28	2777	1218	2,244	-1,919
Sociology of Education	SOCED	2	0,353	90	2,093	65	0	1501	479	1,485	0,735
Journal for Research in Mathematics Education	JRME	1,907	0,214	56	2,631	55	22	111	3	0,815	1,431
Language Learning	LANLE	1,869	1,023	75	2,473	62	33	698	156	1,719	2,055
Teaching and Teacher Education	TTE	1,823	0,295	69	1,836	78	53	915	262	1,706	-0,206
Science Education	SCIED	1,8	0,535	73	2,56	78	39	1611	507	2,108	0,049
Journal of Engineering Education	JOUENE	1,739	0,158	38	6,176	72	32	137	4	1,571	2,207
Early Childhood Research Quarterly	ECRQ	1,73	0,324	56	1,53	64	36	1342	421	1,385	-0,467
Learning Media and Technology	LMT	1,702	0,464	16	1,396	28	19	1637	1191	1,051	-1,470
Journal of Computer Assisted Learning	JCAL	1,679	0,085	49	2,385	65	41	833	358	1,290	-0,373
Health Education Research	HER	1,667	0,173	79	0,814	80	33	1676	480	1,575	-1,062
British Journal of Educational Technology	BJET	1,633	0,325	45	1,613	63	48	3141	819	2,055	-2,435
Journal of School Health	JOUSCH	1,547	0,296	65	1,001	63	36	2280	524	1,564	-1,419

Journals	Codex	IF 2015	Immediacy index JCR	*h* index SSCI	SJR	*h* index SCImago	*h5* index Google	Altmetric total score (2 years – any time)	Altmetric total score (last 3 months)	General factorial score (GFS)	Specific factorial score (SFS)
AIDS Education and Prevention	AIDS	1,524	0,225	59	1,112	58	24	526	43	0,640	0,450
Tesol Quarterly	TESQ	1,513	0,308	71	1,46	59	24	449	48	0,834	0,808
Instructional Science	INSS	1,462	0,514	47	1,418	51	32	661	216	0,878	0,436
Journal of American College Health	JAMCH	1,417	0,338	63	1,087	69	32	2029	864	1,700	-1,629
BMC Medical Education	BMC	1,312	0,19	24	0,698	38	33	4498	1073	1,611	-4,067
Reading and Writing	REW	1,308	0,213	52	1,332	48	32	546	245	0,693	-0,140
Economics of Education Review	EER	1,297	0,176	52	1,352	57	42	3219	1243	2,050	-3,431
Studies in Higher Education	SHIED	1,222	0,174	54	1,16	64	35	1863	611	1,331	-1,620
Journal of Educational Research	JER	1,218	0,162	54	0,708	53	24	386	108	0,385	,0280
Higher Education	HIGED	1,207	0,145	59	1,717	61	38	1517	393	1,268	-1,015
ETR&D-Educational Technology Research and Development	ETRD	1,171	0,047	55	1,817	63	34	997	484	1,107	-0,923
Journal of Higher Education	JOUHIED	1,136	0,2	59	1,189	57	27	500	60	0,589	0,199
British Educational Research Journal	BRIEDRJ	1,124	0,138	42	0,938	60	33	1181	245	0,731	-0,882
Educational Administration Quarterly	EAQ	1,118	0,087	45	2,945	48	32	405	63	0,710	0,448
Educational Technology & Society	ETECHS	1,104	0,052	39	1,325	55	40	1	0	0,369	-0,062
Elementary School Journal	ELESCJ	1,04	0,593	63	1,109	52	27	222	37	0,642	1,020

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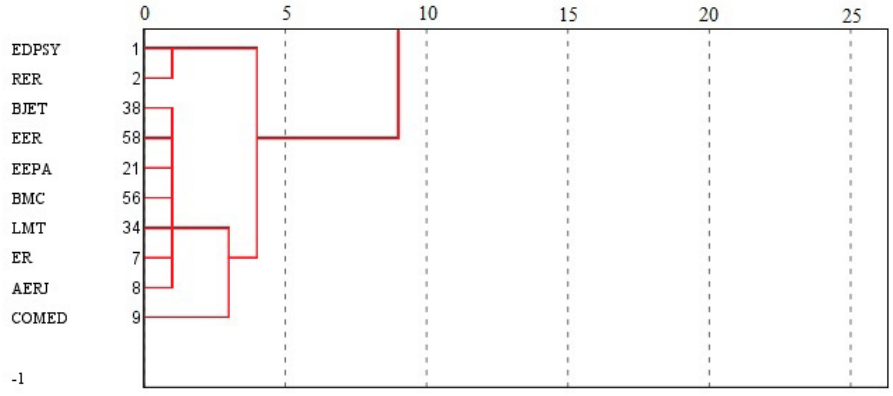
Journals	Codex	IF 2015	Immediacy index JCR	*h* index SSCI	SJR	h index SCImago	*h*5 index Google	Altmetric total score (2 years – any time)	Altmetric total score (last 3 months)	General factorial score (GFS)	Specific factorial score (SFS)
International Journal of Science Education	IJSE	1	0,248	65	1,256	72	36	963	214	1,084	-0,389
Research in Higher Education	RESHIE	1	0,026	55	1,724	57	31	833	242	0,775	-0,546
American Journal of Education	AJE	0,925	0,05	42	3,729	33	22	344	112	0,528	0,732
Science & Education	SCIEDU	0,792	0,277	73	0,699	30	23	0	0	0,119	0,498
Harvard Educational Review	HARE-DRE	0,786	0,143	85	1,084	54	21	83	32	0,467	0,466
Teachers College Record	TECORE	0,746	0,528	58	1,255	59	36	8	2	0,642	0,795

The dendrogram has been divided into four figures because of its size, in order to visualize it as clearly as possible. The figures show the first four clusters, generated from the scientific journals catalogued as excellent, outstanding, noteworthy and good. We have not included in the figures the cluster of acceptable journals provided its extension and irrelevance to delimit fronts, as these are the journals with lowest citation rates.

GRAPH I. Hierarchic dendrogram of the *cluster* analysis of the excellent journals of *Education & Educational Research*



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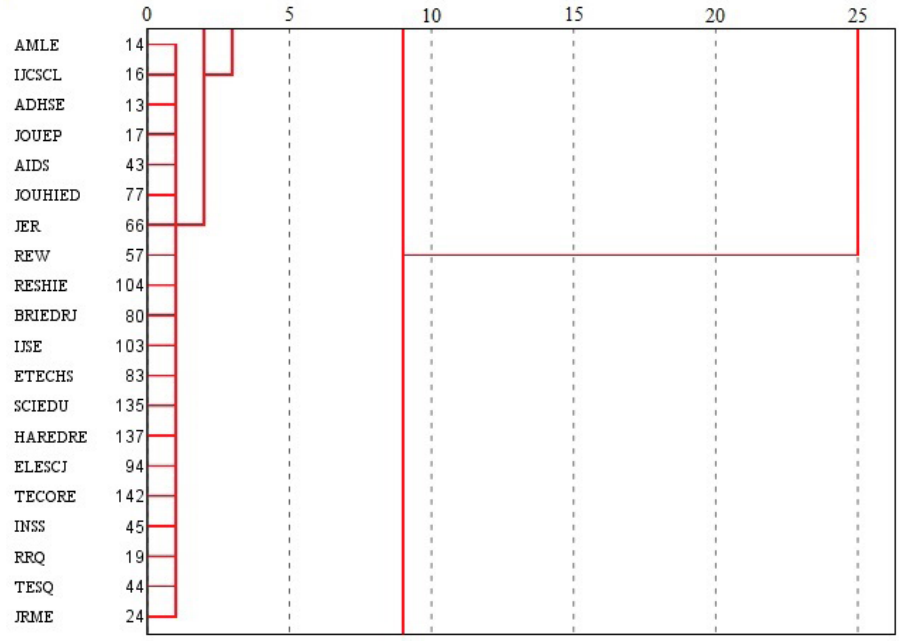
GRAPH II. Hierarchic dendrogram of the *cluster* analysis of the outstanding journals of *Education & Educational Research*



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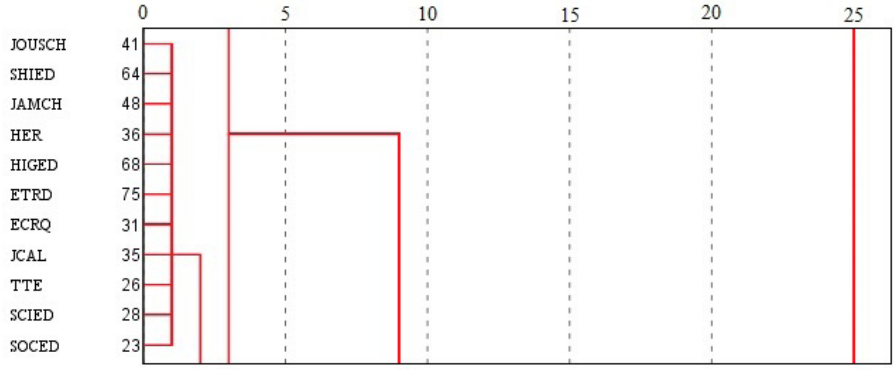
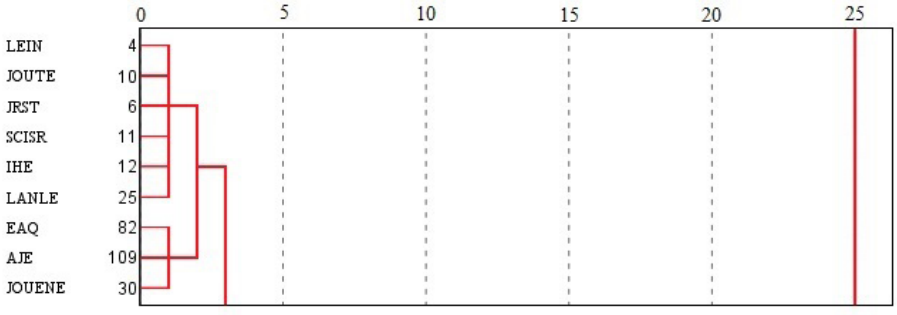
GRAPH III. Hierarchic dendrogram of the *cluster* analysis of the noteworthy journals of *Education & Educational Research*



GRAPH IV. Hierarchic dendrogram of the *cluster* analysis of the good journals of *Education & Educational Research*



According to the clustering obtained, cluster A could be considered as the cluster of excellent journals. Cluster B, could be that of outstanding journals, just a step below. Then, we find journals of varied quality, denoted as noteworthy in cluster C; cluster D agglutinates the good journals, while cluster E includes the acceptable journals. Next, we show the journals that belong to each cluster including their factorial punctuations

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in the general impact factor ($G_{FS,}$ General impact factor) and the specific factor ($S_{FS,}$ Asocial academic factor). This is a complex specific factor, positively charged for academic indicators, a "traditional" indicator negatively charged for social indicators obtained from the web.

– Cluster A – excellent journals:
  1. *Computers & Education* (COMED; G_{FS} = 5,266; S_{FS} = -5,243).
  2. *American Educational Research Journal* (AERJ; G_{FS} = 3,359; S_{FS} = -0,131).
  3. *Educational Researcher* (ER; G_{FS} = 3,281; S_{FS} = -1,757).
  4. *Learning Media and Technology* (LMT; G_{FS} = 1,051; S_{FS} = -1,470).
  5. *BMC Medical Education* (BMC; G_{FS} = 1,611; S_{FS} = -4,067).
  6. *Educational Evaluation and Policy Analysis* (EEPA; G_{FS} = 2,244; S_{FS} = -1,919).
  7. *Economics of Education Review* (EER; G_{FS} = 2,050; S_{FS} = -3,431).
  8. *British Journal of Educational Technology* (BJET; G_{FS} = 2,055; S_{FS} = -2,435).
  9. *Review of Educational Research* (RER; G_{FS} = 4,173; S_{FS} = 1,388).
  10. *Educational Psychologist* (EDPSY; G_{FS} = 3,169; S_{FS} = 4,150).

– Cluster B – outstanding journals:
  1. *Journal for Research in Mathematics Education* (JRME; G_{FS} = 0,815; S_{FS} = 1,431).
  2. *Tesol Quarterly* (TESQ; G_{FS} = 0,834; S_{FS} = 0,808).
  3. *Reading Research Quarterly* (RRQ; G_{FS} = 1,213; S_{FS} = 1,343).
  4. *Instructional Science* (INSS; G_{FS} = 0,878; S_{FS} = 0,436).
  5. *Teachers College Record* (TECORE; G_{FS} = 0,642; S_{FS} = 0,795).
  6. *Elementary School Journal* (ELESCJ; G_{FS} = 0,642; S_{FS} = 1,020).
  7. *Harvard Educational Review* (HAREDRE; G_{FS} = 0,467; S_{FS} = 0,466).
  8. *Science & Education* (SCIEDU; G_{FS} = 0,119; S_{FS} = 0,498).
  9. *Educational Technology & Society* (ETECHS; G_{FS} = 0,369; S_{FS} = -0,062).
  10. *International Journal of Science Education* (IJSE; G_{FS} = 1,084; S_{FS} = -0,389).
  11. *British Educational Research Journal* (BRIEDRJ; G_{FS} = 0,731; S_{FS} = -0,882).
  12. *Research in Higher Education* (RESHIE; G_{FS} = 0,755; S_{FS} = -0,546).
  13. *Reading and Writing* (REW; G_{FS} = 0,693; S_{FS} = -0,140).

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14. *Journal of Educational Research* (JER; G_{FS} = 0,385; S_{FS} = 0,028).
15. *Journal of Higher Education* (JOUHIED; G_{FS} = 0,589; S_{FS} = 0,199).
16. *AIDS Education and Prevention* (AIDS; G_{FS} = 0,640; S_{FS} = 0,450).
17. *Journal of Education Policy* (JOUEP; G_{FS} = 1,043; S_{FS} = 0,729).
18. *Advances in Health Sciences Education* (ADHSE; G_{FS} = 0,910; S_{FS} = -0,077).
19. *International Journal of Computer-Supported Collaborative Learning* (IJCSCL; G_{FS} = 0,476; S_{FS} = 1,173).
20. *Academy of Management Learning & Education* (AMLE; G_{FS} = 0,824; S_{FS} = 0,786).

– Cluster C – remarkable journals:
1. *Sociology of Education* (SOCED; G_{FS} = 1,485; S_{FS} = 0,735).
2. *Science Education* (SCIED; G_{FS} = 2,108; S_{FS} = 0,049).
3. *Teaching and Teacher Education* (TTE; G_{FS} = 1,706; S_{FS} = -0,206).
4. *Journal of Computer Assisted Learning* (JCAL; G_{FS} = 1,290; S_{FS} = -0,373).
5. *Early Childhood Research Quarterly* (ECRQ; G_{FS} = 1,385; S_{FS} = -0,467).
6. *ETR&D-Educational Technology Research and Development* (ETRD; G_{FS} = 1,107; S_{FS} = -0,923).
7. *Higher Education* (HIGED; G_{FS} = 1,268; S_{FS} = -1,015).
8. *Health Education Research* (HER; G_{FS} = 1,575; S_{FS} = -1,062).
9. *Journal of American College Health* (JAMCH; G_{FS} = 1,700; S_{FS} = -1,629).
10. *Studies in Higher Education* (SHIED; G_{FS} = 1,331; S_{FS} = -1,620).
11. *Journal of School Health* (JOUSCH; G_{FS} = 1,564; S_{FS} = -1,419).

– Cluster D – good journals:
1. *Journal of Engineering Education* (JOUENE; G_{FS} = 1,571; S_{FS} = 2,207).
2. *American Journal of Education* (AJE; G_{FS} = 0,528; S_{FS} = 0,732).
3. *Educational Administration Quarterly* (EAQ; G_{FS} = 0,710; S_{FS} = 0,448).
4. *Language Learning* (LANLE; G_{FS} = 1,719; S_{FS} = 2,055).
5. *Internet and Higher Education* (IHE; G_{FS} = 1,630; S_{FS} = 1,656).
6. *Scientific Studies of Reading* (SCISR; G_{FS} = 1,000; S_{FS} = 2,195).
7. *Journal of Research in Science Teaching* (JRST; G_{FS} = 2,631; S_{FS} = 2,153).
8. *Journal of Teacher Education* (JOUTE; G_{FS} = 1,571; S_{FS} = 1,294).
9. *Learning and Instruction* (LEIN; G_{FS} = 2,161; S_{FS} = 1,689).

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Cluster E is comprised of the remaining 180 journals, considered as acceptable journals. The first journal in cluster E is *Modern Language Journal* (MOLANJ; G_{FS} = 0,737; S_{FS} = 2,655) and the last *International Journal of Art & Design Education* (IJARTDE; G_{FS} = -1,010; S_{FS} = -0,482). Clusters D and E have not been taken into consideration for the configuration of research fronts. By no means we are stating that these journals are unsatisfactory, this indicates simply that their general citation is lower than the rest. They are in any case indexed in JCR, which is a noticeable accomplishment.

Following this procedure, we have configured five well differentiated clusters of journals about *Education & Educational Research* with different quality attending to the indexes considered.

Configuring research fronts from the journals evaluated

As discussed above, we have evaluated 230 journals in the field *Education & Educational Research*. We consider those which are included in clusters A, B or C as those best qualified to conform emerging research fronts.

To identify hot topics that conform the different research fronts, we perform an analysis of content using the titles and research lines of the journals. This information is then further processed removing the words that do not convey relevant meaning, for example prepositions, articles, pronouns or terms such as *journal*, *review*, *quarterly*, etc.

Besides, we present keywords in two ways: literally as they appear in the tiles and research lines and individualized and lemmatized. Literal keywords can be words or short phrases, we also present individual one-word keywords. To lemmatize the keywords, we use the lexeme instead of the whole word, for example "Educat*" represents all words which lexeme is "Educat", e.g. "Education", "Educational", "Educative", etc.

For instance, *"research"* and *"educational research"* would be considered both separately as literal keywords with a frequency of 1 each. However, we have also considered them as individualized keywords. This way, word *"research"* would have frequency 2 and *"educat*"* frequency 1.

The literal keywords considered are those with frequency 2 or higher, while the individualized keywords are considered with frequency 3 or higher. Table 5 presents the keywords considered:

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TABLE V. Keywords considered for the thematic category Education & Educational Research

Education & Educational Research			
Literal keywords	**Frequency**	**Individualized keywords**	**Frequency**
Education	13	Educat*	125
Higher education	9	Science	23
Learning	6	Research	22
Educational research	5	Policy	18
Science education	5	Health	16
Educational technology	3	Learning	15
Literacy	3	Technology	14
Sociology	3	Development	13
Teacher education	3	Teach*	11
Teaching	3	Higher	10
Health education	2	Psychology	6
Educational policy	2	School	6
Assessment	2	Management	5
Mathematics education	2	Early	5
Psycholinguistics	2	Childhood	5
Public policy	2	Sociology	4
Administration	2	Training	4
Anthropology	2	Language	4
Child development	2	Literacy	3
Digital technology	2	Administration	3
Early childhood education	2	Instruction	3
Economics	2	Evaluation	3
History	2		
Instruction	2		
Management	2		
Professional development	2		
Psychology	2		
Technology	2		
AIDS	2		
Medical education	2		
Science	2		

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Considering the frequencies reported in Table 5, we can observe the rich thematic variety around the category *Education & Educational Research*. When analysing both columns, we can appreciate that many keywords are in the first positions both for the literal and individualized categories. This way, the most important research fronts that can be delimited for *Education & Educational Research* according to their frequencies / sum of frequencies in both columns are the following:

IF_1: *Educat** (138).
IF_2: *Science - science education* (30).
IF_3: *Research - educational research* (27).
IF_4: *Learning* (21).
IF_5: *Higher education - higher* (19).
IF_6: *Policy* (18).
IF_7: *Health* (16).
IF_8: *Technology* (16).
IF_9: *Teach** (14).
IF_{10}: *Development* (13).

The emerging research fronts inferred are very generic, without specifying with detail the focus of interest. We have merged some keywords to constitute a single research front according to their similarity. This is the case of the fronts *educat** (*education – educational), teach* (teaching – teacher), science – science education*, *research – educational research* and *higher education – higher*. Thus, we find research fronts that indicate an interest for the studies about science education (*science – science education*), learning (*learning*), higher education (*higher education – higher*), educational policymaking (*policy*), studies about development, evolutive psychology and education (*development*), studies about health (*health*), technology education and new technologies for education ICT (*technology*) and teaching (*teach**).

Discussion

Emerging research fronts are configured with two types of impact: scientific (factor/component 1) saturated by all the citation indexes and an asocial impact (factor/component 2) saturated negatively by the indexes of social citation (Altmetric 2 years, Almetric 3 months, and Google Scho-

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lar) and positively by the indicators of scientific citation (impact factor, immediacy index, SJR, SSCI h index of SSCI and Scimago h index). We have thus identified an underlying academic concept of educative research with high citation impact that underestimates social impact.

It is possible to obtain a combined rating for a scientific journal as a standardized factorial punctuation from the multiple citation indicators. It has been demonstrated that the factorial punctuation generated by the general factor of each journal represent a novel combined metaindex that makes it possible to evaluate each journal. The eight evaluative indicators that conform the five clusters classify the 230 journals of education and educative research according to their evaluative quality.

Cluster analysis groups journals of similar quality and classifies them into clusters of differential quality. From the clusters composed by journals with high citation, we extract two types of keywords from the contents of their titles and editorial lines: literal and individualized, with which we configure the main emerging research front. The main advantage of this approach with respect to traditional classification into quartiles is that they group journals beyond their scientific factor as we also consider and combine other indicators of social impact. The emerging research fronts are identified from the tiles and research lines of the journals because they constitute general themes, in contrast with the titles and keywords of papers, which correspond to more specific themes. A similar work using research papers would identify relevant information about hot topics in particular areas of educative research.

We consider that the methodology presented to infer emerging research fronts constitutes an original and fertile innovation that could complement others such has co-citation, co-verbal analysis and Delphi in future projects. It would be convenient to initiative new studies combining appropriately the proposed methodology along with the aforementioned. The used of these four methods as mixed methods could bring even stronger evidence about emerging fronts and hot topics in international educative research. Furthermore, a new study could be performed using Scopus, which resembles better the linguistic and cultural diversity of social sciences. Another possible derivation could apply this study to the context of Spanish journals to infer a national agenda for educative research, which Spanish researches would warmly welcome.

The educative research fronts inferred bifurcate into two different concepts: a general conservatism, almost secular, with terms such as edu-

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cation, research, teaching and learning, and an openness to more updated topics (with terms such as scientific education, technology, health, higher educative and policy making and analysis). In such dichotomy may lay the rationale behind the advances in educative research: to maintain what is perennial, in the Kantian sense of the word, and innovate through novel realizations. Time will tell whether this trend that we have identified is finally consolidated.

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Emerging trends on the academic production of history education[1]

Tendencias emergentes en la producción académica de educación histórica

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Abstract

Research on history education has increased in recent years. Systematic reviews show that historical thinking and historical awareness are two fundamental axes of the research carried out in recent decades. Research in this area has also looked into key methodological concepts, current lines of research, teaching practice and the uses and purposes of teaching history. The aim of this article is to analyse academic production on history education in journals included in the databases of the Core Collection of the Web of Science in the period 2007-2017 and to examine the impact of the new ESCI (Emerging Sources Citation Index) database. A systematic search was carried out of Web of Science databases: the Science Citation Index Expanded, the Social Sciences Citation

(1) Este trabajo es resultado de los proyectos de investigación PGC2018-094491-B-C31 y PGC2018-094491-B-C33, subvencionados por el Ministerio de Economía y Competitividad de España, 20638/JLI/18 y 20874/PI/18, financiados por la Fundación Séneca de la Región de Murcia.

Index, the Arts & Humanities Citation Index and the Emerging Sources Citation Index. A bibliographic analysis has been carried out using the technique of science mapping. Three bibliometric techniques were employed: visualization of similarities; thematic mapping and evolution; and visual analytics. Our analysis has made it possible to identify the main topics which articulate history education as a specific field of knowledge. It has been noted that scientific production is concentrated in a small number of researchers and countries. There has been a tenfold increase in publications on history education on the WoS. This increase can mainly be attributed to the incorporation of ESCI (emerging) journals from 2015. The influence of the inclusion of this new database on the visibility of emerging countries and research groups has been proven. The inclusion of journals in the ESCI has allowed for a greater diversity of academic production on the WoS. This has confirmed a greater presence of research on history education in countries such as Spain, Brazil or Russia. However, the thematic differences between this database and the main ones in the Core Collection are small. Certain weaknesses are noted, among them the atomization and scarcity of collaboration among researchers of different nationalities and even among those from the same country.

Keywords: history education, bibliographic network analysis, cluster analysis, science mapping, ESCI.

Resumen

En los últimos años se ha incrementado la investigación sobre educación histórica. Los estudios de revisión convienen en que pensamiento histórico y conciencia histórica son dos ejes fundamentales de las investigaciones en las últimas décadas. También se ha profundizado en conceptos metodológicos clave, líneas de investigación actuales, la práctica docente y los usos y fines de la enseñanza de la historia. El objetivo de este artículo es analizar la producción académica sobre educación histórica en revistas incluidas en las bases de datos del Core Collection de la Web of Science en el periodo 2007-2017 y comprobar el impacto de la nueva base de datos ESCI (Emerging Sources Citation Index). Se realizaron búsquedas sistemáticas en las bases de datos del Web of Science: Science Citation Index Expanded, Social Sciences Citation Index, Arts & Humanities Citation Index y Emerging Sources Citation Index. Se ha realizado un análisis bibliográfico a través de un mapeo científico. Se han utilizado tres técnicas bibliométricas: visualización de similitudes (VOS), mapeo temático y análisis visual. El análisis ha permitido identificar las principales temáticas que articulan la educación histórica como un campo específico de conocimiento. Se ha constatado que la producción se concentra en número reducido investigadores y países, aunque con un incremento notable. Se han multiplicado por diez las publicaciones sobre educación histórica presentes en la WoS. Este incremento se ha debido fundamentalmente a la incorporación de las revistas ESCI (emergentes) a partir de 2015. Se ha comprobado la influencia

de la inclusión de esta nueva base de datos en la visibilización de países y grupos de investigación emergentes. La incorporación de revistas en la ESCI ha permitido una mayor diversidad de la producción académica en la WoS. Esto ha confirmado una mayor presencia de investigaciones sobre educación histórica en países como España, Brasil o Rusia. No obstante, las diferencias temáticas entre ESCI y las principales del Core Collection son escasas. Se señalan además algunas debilidades, entre ellas la atomización y escasez de colaboraciones entre investigadores de diferentes nacionalidades e incluso entre los de la misma nacionalidad. Se identifican además los principales nodos que articulan las redes de investigación emergentes.

Palabras clave: educación histórica, análisis bibliométrico, análisis de conglomerados, mapeo científico, ESCI.

Introduction

Research on history education

The aim of history teaching, since the time of its introduction into school curriculums in the 19th century, has traditionally been to promote national identification (López-Facal and Cabo, 2012). This orientation fell into crisis in Europe when the historiographic perspective of the Annales school, which bypassed political content and focused on other more transversal issues, was introduced into formal education. The intention of this was to overcome the prominence of the nation as a historical subject. However, the renewal of school history contents was not always accompanied by a reflection based on that which was useful for teaching and learning and, even less so, by a renewal of the way in which it should be taught (VanSledright, 2011).

The most influential contributions to the current definition of history education originated from the United Kingdom, where, in 1972, the *History Project 13-16*, which later became known as the *School History Project* (Domínguez, 2015), was set up. At the same time, in Germany and Central Europe the horrors of the Nazi genocide led to a process of reflection on the role of education and, more specifically, that of history education (Wilschut, 2010). This process constitutes an underlying idea in the reflections and proposals of critical German teaching developed later by Rüsen (2005, 2015).

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A line of research was begun in the United Kingdom linked to what is known today as historical thinking. It attempts to provide students with the necessary intellectual tools for analysing the past and relating it with understanding the problems of the present (Chapman, 2011; Counsell, 2011; Lee, 2005; Lee & Ashby, 2000). At the same time, research influenced by cognitive psychology and the technique of expert and novice analysis was being carried out in the United States (VanSledright, 2011, 2014; Wineburg, 2001). In fact, this research has led to studies in which the use of historical sources and the work of the historian have a primary role (Levstik & Barton, 2008; Monte-Sano, De la Paz, & Felton, 2014; Reisman, 2012; Wineburg, Martin, & Monte-Sano, 2013). In Canada, the work of the *Centre for the Study of Historical Consciousness*, directed by Peter Seixas, is of particular importance. This centre has made a great effort to narrow down the definition of historical consciousness and historical thinking and to adapt these ideas in a practical way to the reality of the classroom via projects such as the *Historical Thinking Project* and *Historical Thinking Assessment* (Lévesque, 2008; Seixas, 2004; Seixas & Morton, 2013). In addition to this group in Canada, there have been many studies on history education which have attempted to combine the two aforementioned concepts (Létourneau, 2014; Zanazanian, 2015). Such research has had a great influence on the academic production of other English-speaking contexts (Parkes & Donnelly, 2014), as well as in other European countries such as the Netherlands (Bjorn, Sanne, Itzél, & Theo, 2018; Grever, Peltzer, & Haydn, 2011; Van Boxtel & Van Drie, 2012; Van Boxtel, Grever, & Klein, 2015).

In the Ibero-American sphere, studies by Cerri & Amézola (2010), Domínguez (2015), Gómez & Miralles (2015, 2016), López-Facal (2014), López, Carretero & Rodríguez-Moneo (2015), Miralles, Gómez & Monteagudo (2019), Miralles-Martínez, Gómez-Carrasco, Arias-González & Fontal-Merillas (2019), Rodríguez-Medina, Gómez, Miralles & Aznar (2020), Sáiz & López-Facal (2015), and Schmidt (2005) show how the proposals from the United Kingdom, USA and Canada have been incorporated into their research on history education in combination with the contributions from Central Europe, which place an emphasis on the ethical dimension of history education. This research shows the importance of making history useful for ethical orientation, in addition to having an effect on the formative possibilities for shaping active and participative citizens. This concept of citizenship has been assumed in

the majority of history education curriculums in western countries (Van Straaten, Wilschut, & Oostdam, 2018).

This increase in research on history education has led to the publication of several monographs in recent years. Among these, those by Counsell, Burn & Chapman (2016), Carretero, Berger & Grever (2017), and Metzger & Harris (2018a) are worthy of mention for looking into key methodological concepts, current lines of research, the practice of teaching and the uses and ends of history teaching. These reviews agree on the fact that the increase in research beginning in the 1990s has been significant (Metzger & Harris, 2018b). The systematic reviews are in agreement that historical thinking and historical consciousness constitute the two fundamental axes of research in recent decades (Seixas, 2017), and that this research has mainly focused on the curriculum, textbooks and, to a lesser extent, interviews, students' perceptions and observational records in order to evaluate intervention proposals and case studies (Epstein & Salinas, 2018). In recent years, the validation of questionnaires and observation scales has been gaining relevance (Gómez, Miralles, Rodríguez-Medina & Maquilón, 2020). The group led by Van Boxtel has been making great advances in this regard (De Groot-Reuvekamp, Anje, & Van Boxtel, 2017; De Groot-Reuvekamp, Ros, & Van Boxtel, 2018).

However, there is still a paucity of evaluation research combining and interspersing methodologies via different techniques and tools. Indeed, both Adler (2008) and Pollock (2014) have warned that the abundance of specific case studies and qualitative studies makes transnational comparison extremely difficult. There is still a lack of bibliometric analyses providing specific empirical data on research trends, quantifying this evolution, examining in depth the connections between the key issues analysed by area and showing the links which exist between groups, universities and researchers, as has been done in other areas (Fontal & Ibáñez, 2017).

Objective and research questions

The objective of this research is to analyse academic production on history education in journals included in the databases of the Core Collection of the Web of Science in the period from 2007 to 2017 and to verify the impact on its visualisation with the creation of the new database of the

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Emerging Sources Citation Index (ESCI). In order to achieve this aim, three research questions have been proposed:

RQ1: To what extent does the WoS, including the ESCI database, reflect the evolution of production on history education? Can different phases be identified?
RQ2: Which are the main journals, countries, research groups and authors with the highest output and with most citations received? Has their presence been modified with the inclusion of the ESCI database?
RQ3: What are the main issues dealt with by articles on history education on the WoS? What are their connections in relation to the ESCI database?

Methods

For this study, a bibliographic analysis has been carried out employing the technique of *science mapping* (Börner, Chen, & Boyack, 2003; Börner & Polley, 2014). This method is used to represent and analyse the social and conceptual structure of the field of history education and its evolution. Three bibliometric techniques have been used: the visualisation of similarities (Van Eck & Waltman, 2010); thematic mapping and evolution (Cobo, López-Herrera, Herrera-Viedma, & Herrera, 2011); and the *visual analytics* technique (Chen, Ibekwe, & Hou, 2010). This combination of different techniques makes it possible to obtain a more accurate and complete overall and progressive representation of the field of knowledge (Small, Boyack, & Klavans, 2014). In the following sections, we shall detail the methods and the techniques employed for the extraction of data.

Data extraction

The time period was narrowed down to between 2007 and 2017 due to the fact that this was a period of consolidation of the knowledge field of history education; one which includes some years prior to the creation of the ESCI database and some after, thereby allowing us to evaluate its influence on the visibility of publications on history education.

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Systematic searches were made of the databases of the Core Collection of the Web of Science: the Science Citation Index Expanded (SCI); the Social Sciences Citation Index (SSCI); the Arts & Humanities Citation Index (AHCI); and the Emerging Sources Citation Index (ESCI). The databases of the WoS are widely disseminated internationally and are frequently used for the bibliometric analysis of specific fields of knowledge (Jiménez, Maz, & Bracho, 2013).

The search words were tailored to the main areas of the field (Carretero et al., 2017): "History Education"; "Teaching History"; "History Teaching"; "Learning History"; "History Learning"; "History Textbooks"; "Historical Thinking" and "Historical Consciousness". 1089 documents were exported which contained one or more of these words in the title, keywords or abstract. These 1089 documents were reviewed individually in order to check that they belonged to the field of knowledge of history education. In the end, 768 documents were extracted which fulfilled the criteria. Articles were included if they were: (1) journal articles; (2) published between 2007 and 2017; (3) the articles were specifically from the field of history education. Subsequently, pre-processing was carried out in order to purge and correct duplicates and possible errors using the SciMAT tool (Cobo et al., 2011). Table I presents the basic information regarding the set of data analysed.

TABLE I. Summary of the basic results of the search

Period 2007-2017	
Total documents	768
Total journals	426
Keywords Plus (ID)	581
Author Keywords (DE)	1836
Average citations per document	3.07
Authors	1079
Authors of single-author documents	394
Documents per author	0.714
Authors per document	1.4
Co-authors per document	1.71
Index of collaboration	2.28

Source: authors' own work

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Data analysis

The analysis was carried out in three phases. In the first, descriptive data were extracted in order to quantify the evolution of publications between 2007 and 2017: the most frequent topics, journals, countries and authors. The R-package bibliometrix v. 1.9.4 (Aria & Cuccurullo, 2017), which has previously been employed in the description of specific fields of knowledge (Nafade et al., 2018), was used to make it possible to analyse the metadata of the bibliographic records.

In the second phase, the evolution of the conceptual structure of the field of knowledge was analysed: the connections between the topics dealt with in the articles, the most cited works and the emerging themes were represented. In the first stage of this phase, bibliometric maps were created using VOSviewer (Van Eck & Waltman, 2010), a tool designed specifically for building and visualising this type of map. Co-occurrence analysis (Callon, Courtial, Turner, & Bauin, 1983) was used in order to identify the most common themes in history education. This tool has recently been applied to the study of conceptual evolution and trends in different fields, such as neuroscience (Yeung, Goto, & Leung, 2017) and health (Gao et al., 2017).

In the third phase, the social structure was analysed by representing the collaboration networks. Citations received by the documents until 12th August 2018 were taken into consideration as this was the date on which the data was downloaded. Citespace (Chen et al., 2010) was used to visualise the connections.

Results

The evolution of research in history education

The increase in history education production between 2007 (17 articles) and 2017 (201) is remarkable (Graph I). Between 2008 and 2012, the number of publications remained stable at around 30-40 articles published annually. The greatest increase in production took place in 2015, and from that year, the growth has been constant. The number of articles on history education between 2007 and 2013 is low in comparison with

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other similar areas of the education sciences. In this regard, Jiménez, Maz y Bracho (2013), focusing only on mathematical education journals in the SSCI, state that between 2009 and 2012, between 250 and 300 articles were published each year, while Jamali, Zain, Samsudin & Ebrahim (2015) showed similar figures (250-300) for publications on physical education in WoS journals in the period 2010-2013. In comparison with these figures, the 20-40 articles per year on history education in the same period shows a significant weakness in this field of knowledge.

GRAPH I. Annual academic production for each database

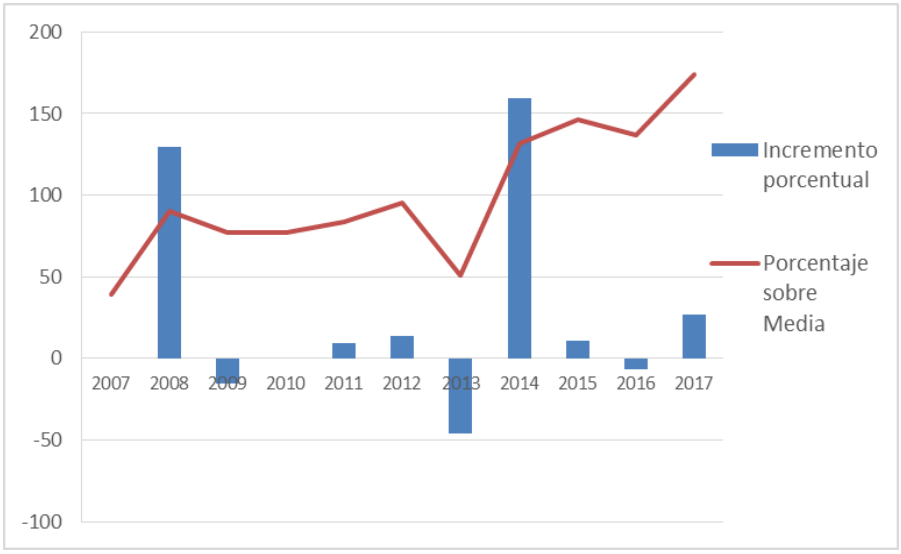
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ESCI	0	0	0	0	0	0	0	0	67	99	126
SCI/SSCI/AHCI	17	39	33	33	36	41	22	57	63	59	75

Source: authors' own work.

Between 2014 and 2017, there was a significant increase in the number of articles published in the WoS databases on history education (from 22 articles in 2013 to 201 in 2017). However, these figures are still much lower than those of other areas, such as mathematics education. Özkaya (2018) recorded a total of 4536 papers on mathematics education on the WoS, a much higher number than the 546 on history education for a similar period.

One of the causes for this increase is the inclusion of the ESCI database. If only the main databases of the *Core Collection*, present in the whole study (SCI, SSCI and AHCI), were taken into account, the increase would be much more modest. Indeed, as can be observed in Graph II, the increase in production in these three databases has two significant moments: 2008 and 2014. The graph shows the percentage increase on the previous year and the percentage of each year over the average of the whole period. Following the increase of 2008, there was a period of stagnation, and even decline, until 2013. In 2014, there was a considerable increase in the number of publications and then a period of stable growth until the end of the study period.

GRAPH II. Percentage increase and percentage above the average of publications on history education in SSCI, SCI and AHCI (2007-2017)



Source: authors' own work.

Journals, countries and authors with most production

Table II shows the journals in which most studies have been published. The results reveal the importance of the ESCI database. Five of the top

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ten journals in number of publications are in the ESCI. Of the remaining five, four are in the SSCI and one in the AHCI. In other words, only four of the top ten journals with most publications on history education are in the *Journal Citation Reports* (JCR). Of the five journals indexed in the ESCI, three are from Brazil, one from Canada and another from Australia.

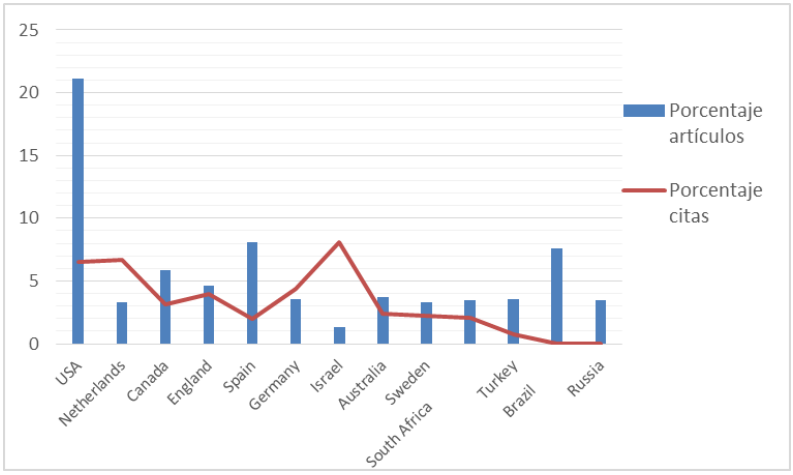
TABLE II. Journals with the highest number of articles on history education

Journal	Number of articles	Database	Country
Journal of Curriculum Studies	32	SSCI	UK
Historical Encounters Journal	20	ESCI	Australia
Aedos	11	ESCI	Brazil
Antiteses	10	ESCI	Brazil
Educar Em Revista	10	ESCI	Brazil
Teachers College Record	10	SSCI	USA
Public Historian	9	AHCI	USA
Curriculum Inquiry	8	SSCI	USA
McGill Journal of Education	8	ESCI	Canada
Paedagogica Historica	8	SSCI	UK

Source: authors' own work.

Graph III shows the countries with the greatest production during this period. The USA is the country with the highest presence of articles on the WoS, with more than 21% of the total. Spain and Brazil are the next countries with a presence of 8% and 7% respectively. The USA, again, is far away the country with most citations received (more than a thousand), multiplying sixfold those received by the Netherlands in second place. Seven of the ten most productive countries are among the most cited. However, Brazil, Turkey and Russia disappear from the list and are replaced by the Netherlands, Israel and Sweden. As far as the order of the list is concerned, Canada, the UK and Germany improve their positions with regard to production, whereas Spain falls from second place in terms of production to fifth in citations received.

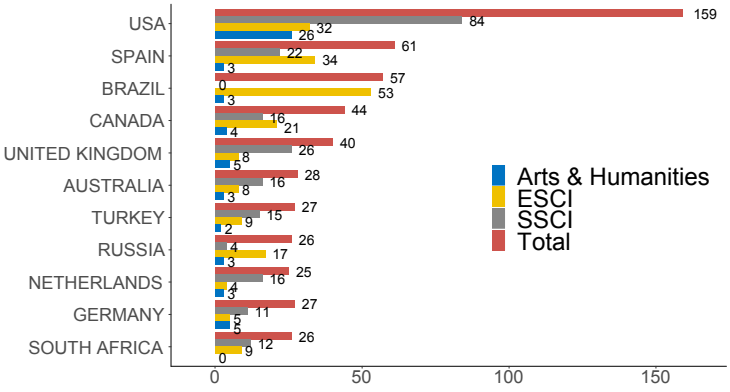
GRAPH III. Countries with highest production and most citations in history education



Source: authors' own work.

By observing Graph IV and Table III, the differences between countries can be seen according to the database in which their papers on history education are published.

GRAPH IV. Number of articles on history education by country for each database



Source: authors' own work.

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These differences are extremely significant. On the one hand, the USA and the United Kingdom are the countries with the greatest number of articles in the main databases of the *Core Collection* of the WoS, and the greatest difference in number with articles published in the ESCI. On the other hand, Brazil and Russia have a lower number of articles in the main databases of the WoS. Spain is the third country in terms of number of articles in the main databases (SSCI, SCIE and AHCI), although its publications in the ESCI are more numerous.

TABLE III. Number of articles and annual percentage on history education by country for each database

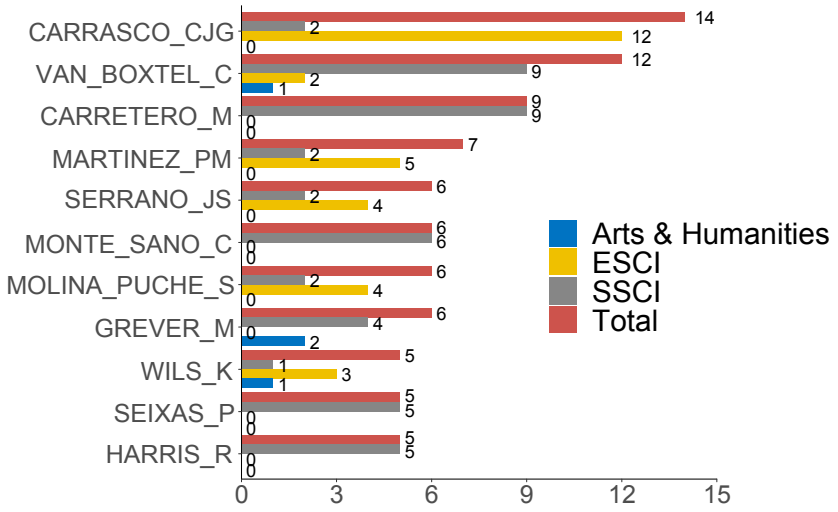
País	ESCI publications	Annual average	AHCI/SSCI/SCI publications	Annual average	Total
USA	32	10.67	127	11.55	159
Spain	34	11.33	27	2.45	61
Brazil	53	17.67	4	0.36	57
Canada	21	7.00	23	2.09	44
United Kingdom	8	2.67	32	2.91	40
Australia	8	2.67	20	1.82	28
Germany	5	1.67	22	2.00	27
Turkey	9	3.00	18	1.64	27
Russia	17	5.67	9	0.82	26
South Africa	9	3.00	17	1.55	26
Netherlands	4	1.33	21	1.91	25
Total	200	66.67	320	29.09	495

Source: authors' own work.

Graph V shows the most productive authors in this period. There is a relative relationship with the data of production by country, albeit with nuances. Among the top ten authors, there are five from Spain: Gómez Carrasco (University of Murcia), Carretero (Autonomous University of Madrid), Miralles Martínez (University of Murcia), Sáiz Serrano (University of Valencia) and Molina Puche (University of Murcia); two from the Netherlands: Van Boxtel (Erasmus University Rotterdam); one

from the USA: Montesano (University of Michigan); one from Canada: Seixas (University of British Columbia); one from the United Kingdom: Harris (University of Reading); and one from Belgium: Wils (University of Leuven). In spite of the fact that the USA occupies an extremely prominent position in terms of academic production on history education (21% of all publications on the WoS), there is only one author among the ten most productive. This detail demonstrates the high degree of atomization in the production of this country. On the contrary, in Spain, production is more concentrated in a small number of authors and research groups: five authors are responsible for two thirds of the academic production on history education in the country with three of them belonging to the same research group. There is also an extremely noticeable difference in terms of authors according to the databases in which they publish. Whilst four of the five Spaniards publish mainly in ESCI journals (Gómez Carrasco, Miralles Martínez, Molina Puche and Sáiz Serrano), the English-speaking authors mainly publish in journals indexed in the SSCI and AHCI (Montesano, Seixas, Harris, etc.).

GRAPH V. Number of articles on history education by author for each database



Source: authors' own work.

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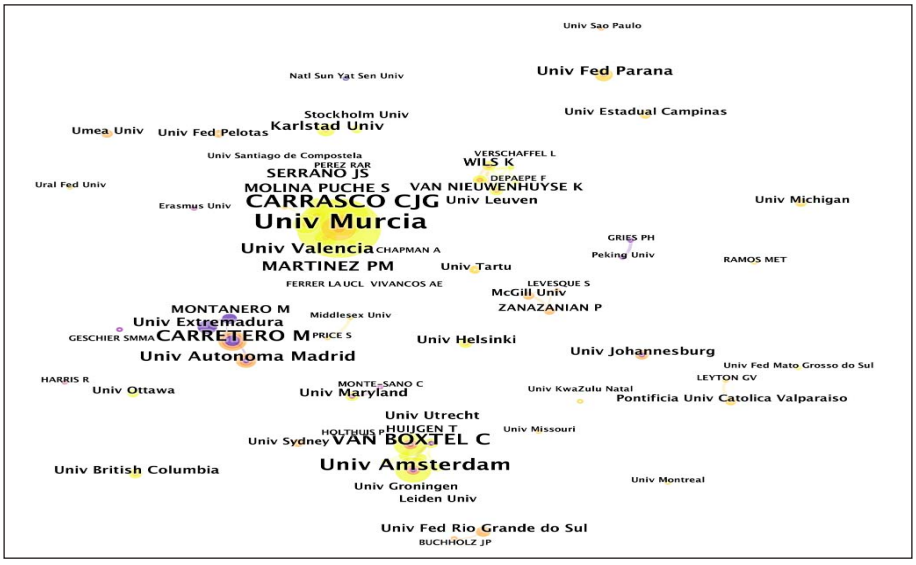
Graph VI shows the co-authorship networks in the period 2007-2017 of the main authors with relation to the academic institution to which they belong. The lack of connections between many of the groups is noteworthy, demonstrating a limited articulation of research in this area. There are only networks of certain significance in the centre around the DICSO group of the University of Murcia (Spain); the University of Amsterdam (the Netherlands); the Autonomous University of Madrid (Spain); and the University of Leuven (Belgium). Other networks have less weight, such as the links between Zanazanian (McGill University) and Lévesque (University of Ottawa) in Canada. The rest of the groups have very few connections. The majority of publications occur in isolation or with a binary connection. There are many authors with significant influence in the bibliographic selection who publish alone, as is the case of Reisman, the author of the most cited article in the sample (2012). The lack of nodes and networks of importance in universities of the USA and the United Kingdom is surprising, if the position of these countries in terms of production and citations received is taken into consideration.

GRAPH VI. Collaboration networks of authors according to academic institution



Source: authors' own work.

Analysis and evolution of topics in history education

Table IV shows the keywords proposed by authors in their articles (Author Keywords=1836), and the keywords assigned by the WoS (Keywords Plus=581). In both cases, those of a general nature are predominant, thus demonstrating the lack of specialisation in articles on history education: History Education; History; Education; History Teaching and Teaching History. In addition to this, the most frequent topics are: the analysis of textbooks (71, including History Textbooks and Textbooks); historical consciousness (including the social role of history, identity, memory and civic and moral education); historical thinking (including the use of historical sources and the work of the historian); and analysis of curriculums. There is a significant absence in the keywords of items regarding research techniques and tools, which make it possible to analyse the methodological approaches of the research: questionnaires, interviews, discussion groups, focus groups and statistical analysis.

TABLE IV. Most common keywords in articles on history education

Author Keywords (DE)	Articles	Keywords-Plus (ID)	Articles
History education	130	Education	64
History	85	Students	43
Historical consciousness	56	Knowledge	27
Education	44	Identity	21
Historical thinking	44	Curriculum	19
History teaching	38	Texts	19
History textbooks	37	Adolescents	17
Textbooks	34	History	15
Teaching history	29	Instruction	15
Curriculum	26	Memory	15
Total Author Keywords	1915	**Total** Keywords Plus	588

Source: authors' own work.

There are no great differences, however, between the keywords proposed in the articles and the database in which they are indexed, with

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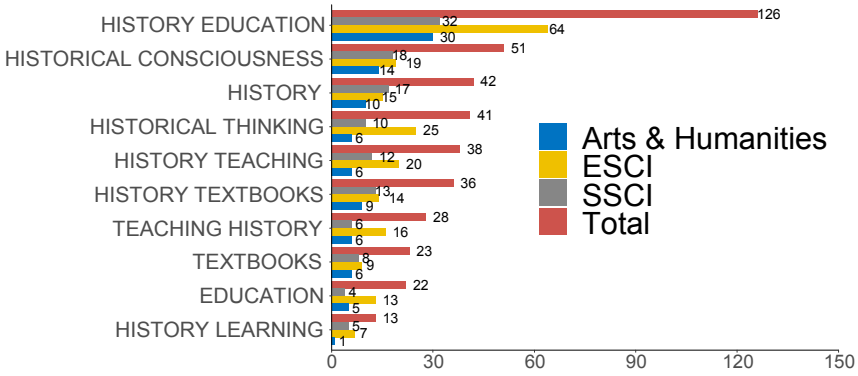
words of a general nature having a similar frequency: "History Education"; "Teaching History"; and "History Learning". The terms "Historical Consciousness", "History", "Textbooks" and "History Textbooks" have a slightly greater presence in the main databases of the *Core Collection*. On the other hand, "Historical Thinking" and "Education" appear more frequently in journals in the ESCI database. The articles published in the ESCI journals seem to focus more on the topic of "Historical Thinking", which is one of the emerging themes. The fact that the word "Education" appears more frequently in the ESCI journals than the rest, in comparison to "History", shows a greater degree of specialisation in themes relating to the processes of teaching and learning.

GRAPH VII. Frequency of keywords according to database



Source: authors' own work.

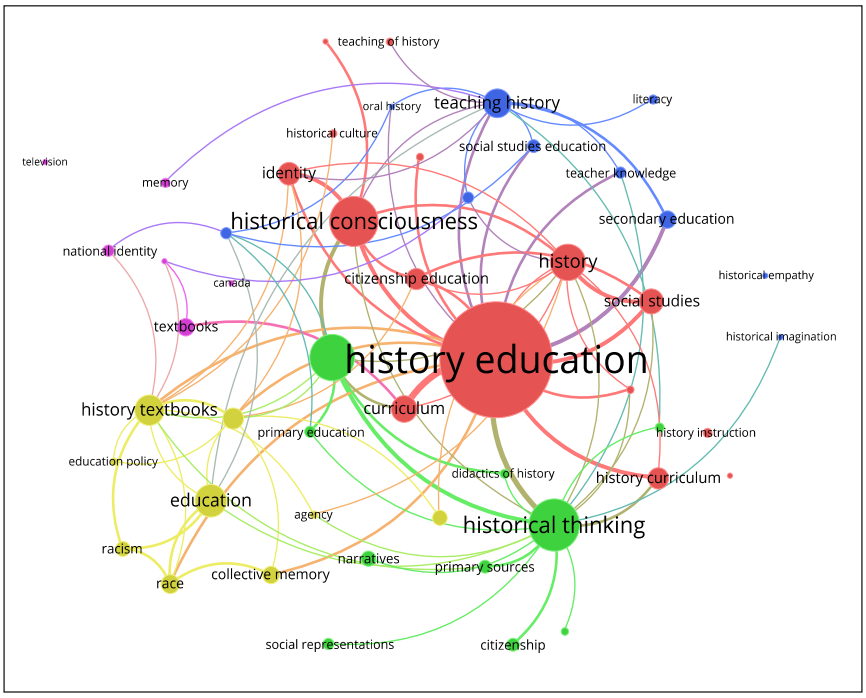
Upon examining in more depth the differences in themes among the articles published in journals in the ESCI and SSCI databases, it has been possible to graphically represent the co-occurrence of authors' keywords according to the database of indexation (ESCI and SSCI) using the VOSviewer (v. 1.6.6) software. In order to achieve this, the set of original data (770 documents) was divided into two sets made up of 332 documents published in ESCI-indexed journals and 196 published in SSCI-indexed journals.

In parallel, to contrast the consistency of the results obtained, the same co-occurrence matrixes were analysed in R (R Core Team, 2017) using the

Bibliometrix tool (Aria & Cuccurullo, 2017), given that the application of different methods of group extraction can produce different results. While VOSviewer applies the *clusterization* algorithm proposed by Van Eck and Waltman (2010), Bibliometrix makes it possible to select between different options of *clusterization*.

Graphs 8 and 9 show the co-occurrence network of keywords formed by the 332 ESCI-indexed articles with both VOSviewer and Bibliometrix. Keywords with a frequency greater than two (50 words) were selected. The diameter of the nodes is proportional to their centrality in the network and the thickness of the edges is proportional to the frequency with which the vertices (keywords) jointly appear. The colour of the nodes represents the group to which the *clusterization* algorithm has assigned each word. As can be observed in the graphs, via the use of the two methods of *clusterization* (VOSviewer and Bibliometrix) an exact correspondence in both the number of groups obtained and the assignation of the nodes to the groups was obtained. The main nodes are *history education* (betweenness=261.45), *historical thinking* (betweenness=150.35), *textbooks* (betweenness=94.53), *history teaching* (betweenness=83.17), and *history textbooks* (betweenness=66.33). As far as the structure of the network is concerned, five groups were obtained (modularity Q=.28). It should be highlighted that these groups could be condensed into three: general problems of teaching and learning (clusters 1 and 4); analysis of historical thinking, work with sources, etc. (cluster 2); and analysis of textbooks (groups 2 and 5). The latter, as can be seen in the network, are related with the analysis of collective memory, national identity, racism, etc.

GRAPH VIII. Co-occurrence network of keywords in ESCI using VOS

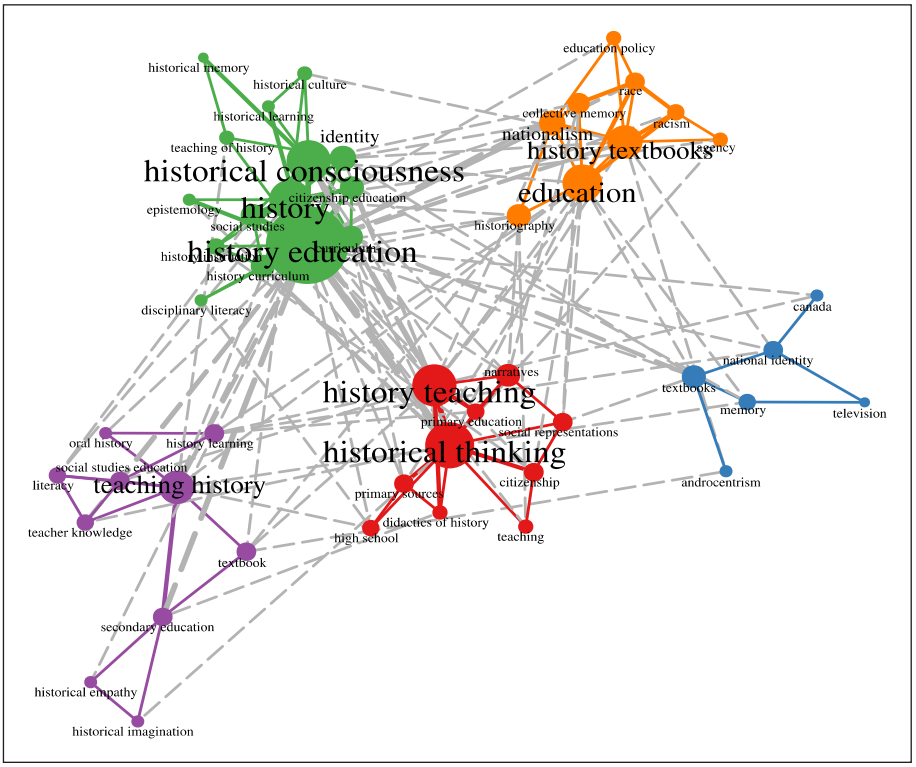


Source: authors' own work.

As far as the topics dealt with in articles published in the SSCI database are concerned, the set of data was made up of 196 documents. As was the case with the previous analysis, keywords with a frequency higher than two were selected, obtaining a total of 54. The results obtained with both VOSviewer and Bibliometrix can be observed in Graphs X and XI. Both *clusterization* methods (VOSviewer and Bibliometrix) achieved an optimal solution of six groups (modularity Q=.44). The main nodes are *history education* (betweenness=427.93), *history teaching* (betweenness=346.72), *history* (betweenness=299.67), *history learning* (betweenness=67.23), *historical consciousness* (betweenness=120.51), and *textbook* (betweenness=87.28). As with the previous case, this representation can be simplified into three: general problems of teaching and learning (clusters 1, 2 and 4); analysis of textbooks and of didactic

transposition of the disciplinary contents in the curricular subject (clusters 3 and 6); and topics related with "historical consciousness" (cluster 4), which has an extremely similar series of connections to the "historical thinking" cluster of the ESCI network.

GRAPH IX. Co-occurrence network of keywords in ESCI using Bibliometrix (R Core Team, 2017)



Source: authors' own work.

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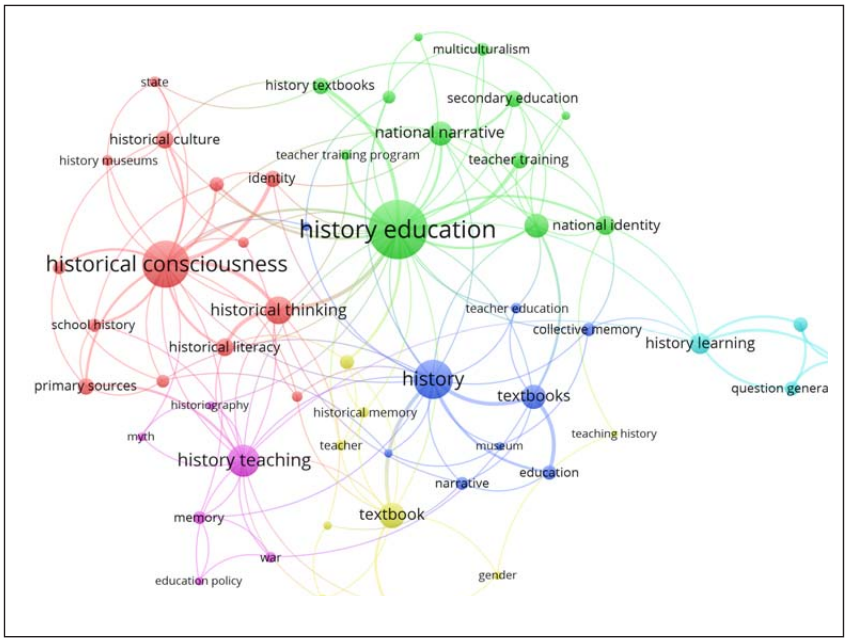
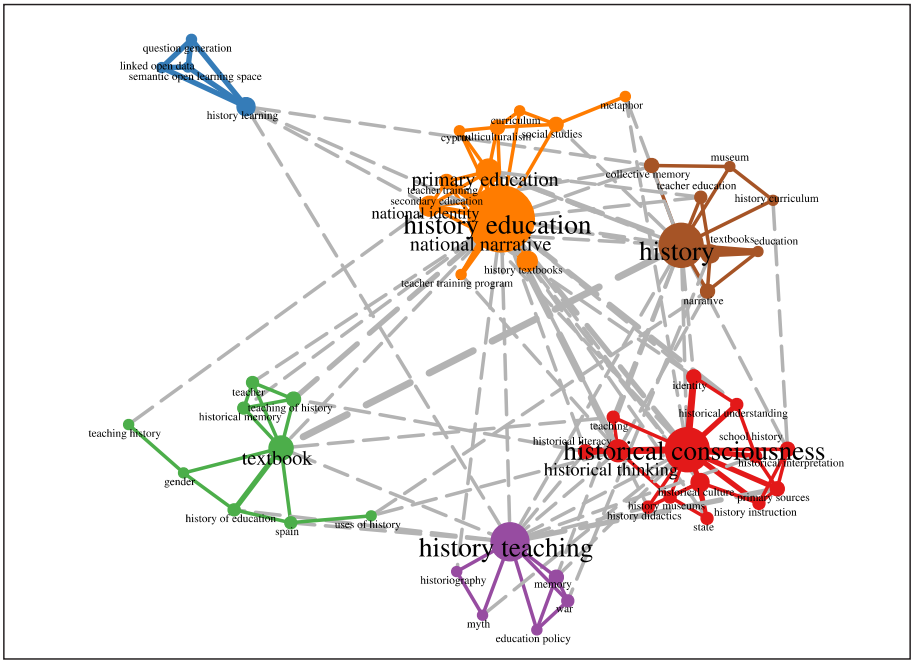
GRAPH X. Co-occurrence network of keywords in SSCI using VOS



Source: authors' own work.

As can be observed, the themes and their connections are not substantially different between the SSCI and ESCI journals. The only differences are those which were pointed out in Graph 7 (frequency of keywords). In ESCI journals, the theme of "Historical Thinking" has a more prominent role, whereas the analysis of textbooks and the didactic transposition of disciplinary contents in the curricular subjects loses significance. This has a close relationship with the temporal sequence. The articles analysed from the ESCI correspond to the last three years of the study, while those from the SSCI are from the whole 11-year study period. This temporal distortion means that emerging themes from this field of knowledge are seen with more clarity in the ESCI journals.

GRAPH XI. Co-occurrence network of keywords in SSCI using Bibliometrix



Source: authors' own work.

The scarcity of differences in topics among the articles published in the different databases can also be observed in Graph 12, which shows the connections among the twenty most productive authors, the key topics of their publications and the journals in which they have published. It can be seen that there are no topics which are directly associated with authors who mainly publish in SSCI journals. The topics intersect with authors and journals with no distinction between the databases in which they are indexed.

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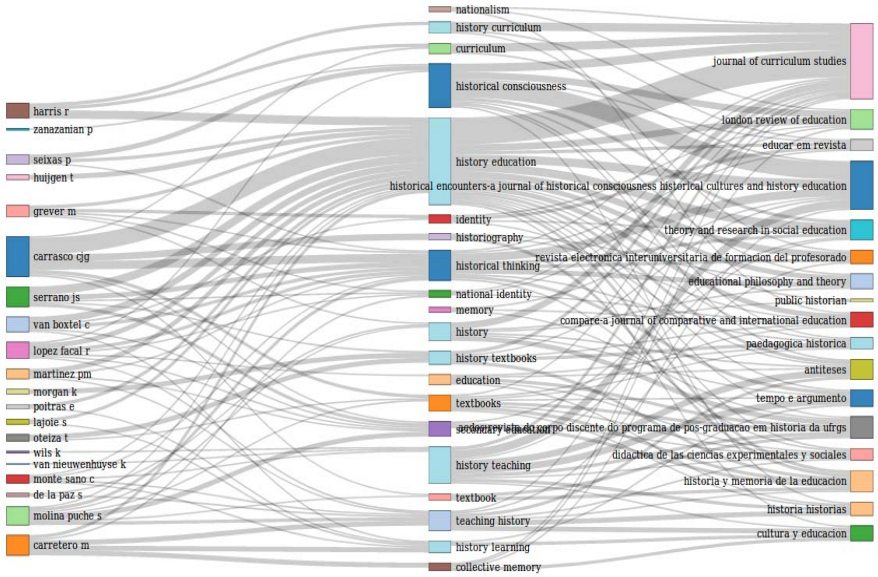
GRAPH XII. Correspondence network between authors, topics and journals



Source: authors' own work.

Discussion

Research in history education seems to have built a paradigm of analysis and interpretation based on two concepts: *historical thinking* and *historical consciousness*. The aim of this has been to overcome the previous stage, which can be defined as pre-paradigmatic, in which research focused on the didactic transposition of the disciplinary contents to the curricular subjects. Research in applied education (scientific, mathematics education, etc.) was conceived in order to identify and resolve teaching and learning problems. In the case of history education, use is made of interpretative models in which theoretical and methodological proposals generated in different contexts converge: *historical thinking* (of a more English-speaking origin) and *historical consciousness* (the origin of which is more associated with Central Europe).

However, at present, the difference between *historical thinking* and *historical consciousness* is not clear. The concept of *historical thinking* frequently stresses the analysis of evidence, reasoning, interpretation and argumentation. *Historical consciousness* is also linked with history in popular culture, media representations and uses of the past. It is possible to find recent studies which use historical thinking to refer to issues of identity and culture (Parkes & Donnelly, 2014) or which use historical consciousness to refer to reasoning (Cerri & Amézola, 2010; Sáiz & López-Facal, 2015). *Historical thinking* can have a more psychological orientation of learning, whereas *historical consciousness* can be more oriented towards cultural studies and collective memory. The inclusion, over recent years, of research groups from Brazil, Spain, Canada and Australia in production on history education on the WoS has enriched academic debate on this issue and made it more complex. The challenge now is to better articulate research between groups from different countries. These connections are currently being strengthened, but there is still a long way to go.

Conclusions

The results have enabled us to establish the current state of affairs of research in history education based on the data of journals indexed on the Web of Science. First of all, it can be concluded that a phase of low visibility in comparison with other similar areas of knowledge, such as mathematics and science education, has been overcome. The notable increase in academic production in recent years has made it possible to multiply publications on history education on the WoS by ten. This increase is mainly attributed to the inclusion of the ESCI (emerging) journals from 2015.

The second conclusion to be drawn refers to the distribution of research by author and country. The inclusion of journals in the ESCI has allowed for a greater diversity of academic production on the WoS. This has confirmed a greater presence of research on history education in countries such as Spain, Brazil and Russia. One of the biggest obstacles for researchers in history education is the lack of specialised journals in the SSCI. This situation places researchers in this field at a disadvantage compared to those of other similar areas.

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The third conclusion is that the social structure of research in history education demonstrates the weaknesses characteristic of an emerging, barely articulated community. For example, co-authorship in history education is in a far from ideal situation. Connections between researchers and research groups from different countries, and even those from the same country, are scarce. Overcoming this deficit should be assumed as one of the immediate challenges in this area. The absence of collaboration networks in the United States (the leading country in academic production in this area of knowledge) is particularly striking, especially when compared with efforts made to overcome the atomization of research in other much smaller countries.

Finally, it can be concluded that the topics of the articles are not substantially different depending on the database in which they are published (SSCI or ESCI). The keywords are similar in both frequency and the connections analysed with two different algorithms of *clusterization*. Of the three research questions posed, the impact of ESCI-indexed journals is only visible in the first two (regarding evolution and the most productive countries, journals and authors). This leads us to consider the strong ethnocentric bias of the SSCI, which has yet to be overcome. Until the entrance of the ESCI journals, a substantial amount of the research carried out in countries from outside of the English-speaking world was excluded from the WoS, in spite of the fact that the topics dealt with were similar. The English-speaking origin of a large part of the SSCI-indexed journals in the field of education (Haba-Osca, González-Sala, & Osca-Lluch, 2019; Parra-González & Segura-Robles, 2019) has much to do with this issue. This leads us to propose several lines of future research regarding this English-speaking bias in relation with other areas of knowledge. Our research has only focused on journals indexed on the WoS and in a specific period of consolidation of the field of knowledge (2007-2017). Future research should be broadened to other databases, specifically to Scopus, and should extend the period if analysis.

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Wikipedia and universities: collaborative work regarding Ibero-American universities[1]

Wikipedia y universidades: trabajo colaborativo en torno a universidades iberoamericanas

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Abstract

This paper presents the conclusions of a study conducted on the Wikipedia entries of the twenty-fie most relevant Ibero-American universities. Higher education institutions have been ranked using Shanghai, URAP and other indicators. In each of the entries of the universities studied in the online encyclopaedia, all existing language versions have been revised. The three most relevant language versions (75 articles in total) have been studied in depth. The 500 most active editors on these higher education texts have also been monitored.

The main purpose of this study is to ascertain whether there is an open community and activity that reflects on higher education centres in the Ibero-American context and whether this constitutes a full Open Authority discourse, as established by Lori Byrd Phillips (2013). That is, if a rigorous and impartial narrative on universities is being created.

Our results show extensive and wide activity. All Ibero-American universities have Wikipedia entries in more than a dozen languages. The most extensive

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articles exceed a thousand contributions. Observation of this activity reveals how the editors and gatekeepers have favoured the creation of a space of knowledge and exchange about universities in the Portuguese and Spanish language settings.

This paper concludes that there is an Open Authority on higher education spaces in Ibero-America in the online encyclopaedia. The entries on the twenty-five universities studied and the 500 editors monitored revealed that there is a rigorous and wide -although uneven- activity on universities in Wikipedia.

Key words: University, Internet, Wikipedia, Higher Education, encyclopaedia, Ibero-America

Resumen

Se presentan las conclusiones de una investigación sobre las entradas en Wikipedia de las veinticinco universidades iberoamericanas más relevantes. Para la selección de los centros educativos superiores se han utilizado los barómetros de Shangai, URAP y otros. En cada entrada de las universidades estudiadas en la enciclopedia online se han revisado todas las versiones idiomáticas existentes. Se ha profundizado en las tres versiones lingüísticas más relevantes (75 artículos en total). También se han monitorizado a los 500 editores más activos sobre estos textos de educación superior.

El objetivo central de la investigación es comprobar si existe un comunidad abierta y actividad que reflexione sobre los centros de educación superior en el ámbito iberoamericano y si esta construcción supone un discurso pleno de autoridad abierta (Open Authority), según lo establecido por Lori Byrd Phillips (2013). Es decir, si se crea una narración rigurosa e imparcial sobre las universidades.

Nuestros resultados muestran una enorme y amplia actividad. Todas las universidades iberoamericanas tienen entradas en Wikipedia en más de una docena de lenguas. Y los artículos más amplios superan las de mil contribuciones. La monitorización de esta actividad revela como los editores y vigilantes han favorecido la creación de un espacio de conocimiento y de intercambio sobre las universidades en el entorno de los idiomas portugués y español.

La conclusión del artículo es que sí existe una autoridad abierta (Open Authority) sobre los espacios de educación superior en Iberoamérica en la enciclopedia online. Las entradas sobre las veinticinco universidades estudiadas y los 500 editores monitorizados revelan que se desarrolla una actividad rigurosa y amplia -aunque desigual- sobre las universidades en Wikipedia.

Palabras clave: universidad, Internet, Wikipedia, educación superior, enciclopedia, Iberoamérica

Introduction: Wikipedia and universities

Since the introduction of Wikipedia by Jimmy Wales and Larry Sanger in January 2001, an intense scientific debate has taken place about its use in higher education institutions. Although some early researchers observed its benefits in the learning process, it has not been until the most recent research during the last five years that its usefulness to the academic world (Hafner, Chik and Jones, 2015) and to learning in higher education courses (Di Lauro and Johinke, 2017; Obregón Sierra and González Fernández, 2018) has been established, especially in terms of collective learning (Meseguer-Artola, 2015). Good practice models for the use of the encyclopaedia in universities have also been published (Lerga and Aibar, 2015) although, as many authors acknowledge, part of the academic community remains sceptical of knowledge that is outside the traditional teaching guidelines (Konieczny, 2016).

Currently, social science researchers suggest that Wikipedia is an ideal place for the development of collaborative projects (Soler-Adillon, Pavlovic and Freixa, 2018; Zazo-Rodríguez, Figuerola, and Alonso-Berrocal, 2015), where Internet users not only communicate, but also develop knowledge processes and networks (Alcázar, Bucio and Ferrante, 2018). In some fields within the digital humanities, such as museum science, the analysis of museum online articles has shown their enormous impact on the construction of rich and highly interactive social spaces (Phillips, 2013; Catalani, 2017; Ojeda and Tramullas, 2017). Thus, Lori Byrd states that the use of Wikipedia facilitates the consolidation of free environments for the exchange and creation of narratives regarding its collections and knowledge in general. In the words of this researcher, the Wikipedia community is establishing itself as an Open Authority.

However, many questions have been raised within academia and the teaching community regarding the benefits and usefulness of the online encyclopaedia (Wikipedia Education Program, 2018 and Blikstad-Balas, 2016). Firstly, its scientific basis and the validity of its contents were called into question (Aibar et al., 2015), as well as the veracity of Wikipedia itself (Konieczny, 2014 and 2016). However, Konieczny's analyses offer us a good example of how the popular belief about the lack of accuracy of the online encyclopaedia differs from reality.

In recent years, new publications have appeared in which collaborative work on the encyclopaedia at university is positively perceived. This

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research has been based mainly on the ability to motivate and involve students "(Jemielniak and Aibar, 2016; Obregón Sierra and González Fernández, 2018; Claes and Deltell, 2019).. They have also focused on the use of Wikipedia as a teaching tool that seems to conform to the educational model proposed by the European Higher Education Area (Meseguer-Artola, 2015; Soler-Adillon et al., 2018 and Azer, 2016) and to equivalent educational standards in the American continent (Alcázar et al., 2018). All these studies show how the use of the online encyclopaedia in university and higher education institutions is beneficial to student learning and, simultaneously, to the construction of a collective, collaborative and open discourse.

It is therefore not surprising that many researchers are directly arguing for collaboration with the virtual encyclopaedia to become a standard feature of normal university studies (Jemielniak and Aibar, 2016; Meseguer-Artola et al., 2016; Tramullas, 2015) and even for further involvement with the world of top-level academic research (Kousha and Thelwall, 2017), a specific example being the use of Wikipedia in molecular biology (Nieto Castañeda, 2016).

On the other hand, collaborative work is the essence of the virtual encyclopaedia created by Wales and Sanger. However, the idea of this disinterested participation has been criticized by groups of thinkers (Ippolita, 2012) and largely reflects the model of self-exploitation proposed by the thinker Byung-Chul Han (2013). Authors such as Remedios Zafra also explain, without expressly citing Wikipedia, that unpaid work is one of the shortcomings of the current digital culture system (Zafra, 2017). However, this collaborative project is entirely consistent with the notion of university education and is one of the cornerstones of the European Higher Education Area.

In our research we have tried to address how these collaborative tools are used to write about universities. We are not referring to the content created by these institutions, but to how wikipedians build their discourse based on content available on the Internet and analogue media. Wikipedia content must always be supported by existing information, and each new edition must respect community standards by building a neutral and rigorous discourse (see Five Pillars, n.d.).

According to different analytical tools, Wikipedia is considered the fifth most visited website (Alexa, 2019). Therefore, it is relevant to conduct further research on how the online community creates a free and collaborative discourse within the virtual encyclopaedia about the twenty-five most relevant universities in Latin America, Portugal and Spain.

Method: objectives and hypothesis

Our research has been made possible through the support of Wikimedia España and Iberocoop. Statistics from the universities' own transparency portals have been used, as well as several rankings on the relevance and importance of the organisations studied.

The main purpose of this study is to assess how the online community builds and debates, that is, how it consolidates a space with an Open Authority about the twenty-five most important Ibero-American universities. To achieve this, the most prestigious and best positioned universities in the fields of educational and research excellence have been selected. In addition, the impact of Wikipedia articles regarding these twenty-five institutions has been examined in the different language versions available in the online encyclopaedia. To address this main objective, we have created several specific objectives:

Objective 1. To compile a list of the twenty-five most relevant universities in the Latin American, Portuguese and Spanish community. We have used the following rankings: URAP (2018), Webometric-IPP of CSIC (2016), NTU-Taiwan (2018) and ARWU-Shanghai (2017).

Objective 2. To monitor the articles of these twenty-five universities in the three most visited and most used languages for each of them.

Objective 3. To count the number of hits, edits, reviewers and participation in each of these articles.

Objective 4. To measure the profiles of the most active editors working on these centres and to evaluate their behaviour according to the knowledge bases (Five Pillars of Wikipedia). To do this, we will analyse the twenty users who have added the most edits and content. If they are not identified as users we will analyse and geolocate their IPs.

Our working hypothesis is that universities, as centres of research and knowledge, create spaces of interest that encourage the Wikipedia community to develop articles and debate the contents of the articles about these centres. This online narrative, as is the case with the development of other spaces where exchanges happens within the virtual encyclopaedia, such as museums, libraries or other cultural spaces (Claes and Deltell, 2019), constitutes a creation independent of the meaning and value of these universities (Open Authority). We propose two working hypotheses:

WH.1. That there are articles in Wikipedia from the twenty-five centres studied in at least three different languages.

WH.2. That the articles created in Wikipedia have been generated by a diverse community and not only by the universities themselves. Building impartial discourses on these research and educational institutions.

Research questions:

RQ.1. Presence. Do the institutions studied have articles in at least three languages in Wikipedia? What is the presence and importance of the different languages in this community?

RQ.2. Activity. What amount of participation, measured by contents and edits, do the articles have?

RQ.3. Debate, construction and participation. How many users have contributed? Impact of the debate and discussion generated by user participation.

Consequently, our research inquires into whether there is sufficient need and willingness within the Wikipedia community to improve, maintain and enrich the articles (the online discourse) concerning the most important universities in the Ibero-American sphere.

Sample: methodology and corpus of study

To develop the methodology we rely, as we have seen, on the concept of Open Authority according to Lori Byrd Phillips (2013), or in other words, if open discourses are built around universities. In addition, we have been assisted by Wikimedia España, for the collection of data from the online encyclopaedia.

The following steps have been taken to answer the research questions. In the tracking and monitorization phase we have used Wikimedia Toolforge:

A. Longviews Analysis provides the volume, metrics and positioning of articles in the various languages. We have used as reference period January 30th to March 30th, 2019 (60 days).

B. Pageviews Analysis provides the visitor statistics and tracking of the online encyclopaedia, the reference period used is also from January 30th to March 30th, 2019 (60 days).

C. The twenty users who have contributed with the most edits and content are analysed. In those cases where they are not identified as users we will analyse and geolocate their IPs with the tool Whatitsipmyaddress.

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In addition to this, we have created a data sheet for each centre (a total of twenty-five universities). In this stage of the methodology, we have studied the following research questions:

Presence: size of each article. To do so, we have taken into account the number of bytes and the word count.

Activity: use of the three most active languages in the articles about these academic centres in the encyclopaedia. Numbers of editors, edits and average edits.

Discussion: the twenty most active user profiles have been studied for each university. The ten users with the most edits and the ten profiles that have added the most content, measured in bytes, have been chosen for each centre.

To be able to answer these questions, we have monitored the articles of the twenty-five universities in their three most requested language versions. As a result, an analysis of 75 articles has been performed. These queries were performed between the 30th of March and the 4th of April 2019.

The selection of the universities was based on four studies on the positioning of higher education institutions, namely URAP (2018), Webometric-Csic (2016), NTU-Taiwan (2018) and ARWU-Shanghai (2017). These four studies measure and assess different factors. Furthermore, some of them, like the Shanghai study, do not include all the universities of the studied environment, because their relevance is insufficient. This is why we have chosen twenty-five universities and have compared them in the different classifications, taking as a reference the first three with which we have performed a comparison. The Shanghai study is only used to classify those universities that have been given the same score. In the case of universities with the same score, they are ranked according to their impact in the Shanghai study. See table I.

TABLE I. Proposed classification of the 25 Ibero-American universities with the highest impact

Rank	University name and acronym	Research score	URAP			NTU-Taiwan			Webo-metrics-CSIC	ARWU-Shangai
			Rank	World rank	Total	Rank	World	Score	Rank	Rank
1	USP	3	1	38	501.25	1	52	70.8	1	3
2	UB	7	2	58	483.03	2	61	68.5	3	1
3	UNAM	15	6	188	405.01	7	218	55.4	2	5
4	UAB	17	4	133	433.95	4	180	57.5	9	0
5	UP	17	5	179	409.00	6	218	55.4	6	0
6	UL	18	3	122	440.89	3	176	57.6	12	2
7	UV	20	7	210	396.62	5	215	55.7	8	16
8	UCM	21	8	228	387.25	9	284	53.2	4	4
9	UAM	27	9	232	386.38	8	233	55.0	10	0
10	UGR	27	10	242	384.14	10	292	53.0	7	8
11	UFRJ	32	14	289	367.06	13	332	51.6	5	0
12	UNICAMP	33	11	258	378.05	11	305	52.3	11	0
13	UNESP	47	12	261	377.63	12	314	52.0	23	0
14	UC	49	15	320	358.29	18	399	50.4	16	0
15	EHU/UPV	52	13	269	373.78	14	335	51.5	25	0
16	UFRGS	53	17	336	354.84	17	392	50.5	19	11
17	UBA	54	16	331	356.00	16	377	50.7	22	7
18	UPF	54	22	378	339.86	15	367	50.9	17	6
19	US	58	18	341	352.42	22	427	49.8	18	0
20	UFMG	62	19	360	345.62	19	403	50.3	24	10
21	UPC	62	23	383	338.41	26	445	49.5	13	0
22	UCH	64	20	361	345.61	24	434	49.7	20	0
23	PUC	73	21	372	341.03	20	416	50.0	32	9
24	UA	89	24	393	334.96	31	498	48.6	34	13
25	UNL	153	25	432	323.93	0	0	0	28	0

Source: by the authors, based on the aforementioned studies. 2018 URAP, 2018 NTU-Taiwan, 2016 Webometric-Csic and 2017 ARWU-Shanghai.

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The first three studies quoted here mainly measure research dissemination and impact. The ARWU-Shanghai study provides a more comprehensive overview of higher education institutions in terms of both teaching and institutional capacity. As can be observed, the countries with the most selected universities are Spain (ten), Brazil (six) and Portugal (five). The regions with the most universities included are Catalonia (four), the State of São Paulo (three), Madrid (two) and Santiago de Chile (two). In total, there are six countries and sixteen Ibero-American regions.

In table II we describe these universities, specifying which are the official and most visited languages in Wikipedia. In addition, we provide the basic data of these centres: the number of students, the number of teachers, as well as their organic distribution in faculties or research centres. Finally, the year they were founded and the public or private nature of these schools are explained. To prepare this file, we have used the transparency data provided by the universities themselves. Due to the differences between these documents, this table is intended only to provide a contextualisation, and therefore the figures should not be directly measured.

One of the most relevant features is that out of the twenty-five centres studied only one is private (and is ranked 23rd). Universities differ in the number of students and teachers, ranging from 12,000 at UPC to almost 35,000 at UNAM. The same applies to teachers and researchers, which vary from 900 in UPC to more than 12,000 in Mexico. Some are long-standing, such as the University of Coimbra (established in 1290) and others are quite recent, such as UPF (1990) or the University of the Basque Country (1980). Official languages also vary. Portuguese it is the official language of eleven of them. Catalan co-exists with Spanish in four of them. Valencian and Spanish are used in one and Spanish is spoken alongside Basque in another. Thus, Spanish is official in eight and co-official in six more. For all these reasons, they are different institutions, but they are all dedicated to research, teaching and sharing knowledge.

TABLE II. Description of the 25 selected universities

Rank	University name	Most visited language	Country	City	Official language	No. of students	No. of teachers	No. of faculties	Year established	Private or public
1	USP-Universidade de São Paulo	pt	Brazil	San Paulo	pt	96364	6008	29	1934 (1827)	Public
2	UB-Universitat de Barcelona	es	Spain	Barcelona	cat	63617	5715	16	1450	Public
3	UNAM-Universidad Nacional Autónoma de México	es	Mexico	Mexico	es	349515	12395	28	1910	Public
4	UAB-Universitat Autònoma de Barcelona	es	Spain	Bellaterra BCN	cat	37166	3851	13	1968	Public
5	UP-Universidade do Porto	pt	Portugal	Oporto	pt	29796	2365	16	1911	Public
6	UL-Universidade de Lisboa	pt	Portugal	Lisbon	pt	47884	3513	18	1290 (1911)	Public
7	UV-Universitat de València Estudi General	es	Spain	Valencia	val-es	65789	4305	18	1499	Public
8	UCM-Universidad Complutense de Madrid	es	Spain	Madrid	es	78117	5904	26	1822 (1499)	Public
9	UAM-Universidad Autónoma de Madrid	es	Spain	Madrid	es	28775	2600	8	1968	Public
10	UGR-Universidad de Granada	es	Spain	Granada	es	55958	3621	26	1531	Public
11	UFRJ-Universidade Federal do Rio de Janeiro	pt	Brazil	Rio de Janeiro	pt	65349	3821	52	1792 - 1920	Public
12	UNICAMP-Universidade Estadual de Campinas	pt	Brazil	Campinas	pt	35656	1867	24	1966	Public
13	UNESP-Universidade Estadual Paulista	pt	Brazil	San Paulo	pt	51995	3389	29	1965	Public
14	UC-Universidade de Coimbra	pt	Portugal	Coimbra	pt	23779	1778	12	1290	Public
15	EHU/UPV-Euskal Herriko Unibertsitatea	es	Spain	Lejona, Basque Country	eu-es	44511	5664	19	1980	Public

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16	UFRGS-Universidade Federal do Rio Grande do Sul	pt	Brazil	Porto Alegre	pt	31587	2749	27	1934 (1895)	Public
17	UBA-Universidad de Buenos Aires	es	Argentina	Buenos Aires	es	324288	28232	13	1821	Public
18	UPF-Univsersitat Pompeu Fabra	es	Spain	Barcelona	cat	12075	907	8	1990	Public
19	US-Universidad de Sevilla	es	Spain	Seville	es	72782	3111	27	1505	Public
20	UFMG-Universidade Federal de Minas Gerais	pt	Brazil	Belo Horizonte	pt	48949	3093	20	1927	Public
21	UPC-Universitat Politècnica de Catalunya	en	Spain	Barcelona	cat	30155	3093	16	1971	Public
22	UCH-Universidad de Chile	es	Chile	Santiago	es	40494	3675	19	1839 (1747)	Public
23	PUC-Pontificia Universidad Católica de Chile	es	Chile	Santiago	es	29703	3446	18	1888	Private
24	UA-Universidade de Aveiro	pt	Portugal	Aveiro	pt	15284	970	4	1973	Public
25	UNL-Universidade Nova de Lisboa	pt	Portugal	Lisbon	pt	20077	1800	9	1973	Public

Source: by the authors, based on the transparency portals of the universities.

Results

As a first result of our research, we have found that all universities include articles in the online encyclopaedia in several languages. As Saorin (2012: 11) notes, Wikipedia should not be understood as a single uniform encyclopaedia, but rather as a network made up of each of its language versions. The twenty-five universities have between 8 and 100 language versions of their articles. These data are provided in Table III. The institutions with the least language diversity in the encyclopaedia are some Brazilian universities (UFRGS, 8 and UNESPE, 9) and other Portuguese universities (AV, 12 and UNL, 13). However, the university that shows the greatest language diversity in Wikipedia is the Federal University of Minas Gerais, which reaches one hundred languages,

although it is true that almost all of them are mere one-line entries briefly explaining that it is a public university in Brazil.

Those that can be considered the five most linguistically diverse universities are UBA, with 52 language versions; UCH, with 51; UCM, with 48; UNAM and UB, both with 47. All these higher education institution belong to the Spanish language sphere (one of them jointly with Catalan) and have the largest number of students in their regions. Furthermore, they are located in major cities and are the capitals of countries or key tourism and cultural hubs, such as Barcelona. The data obtained show a lesser impact of true linguistic variety in the online community for Portuguese-speaking universities, and the greatest linguistic diversity is achieved by higher education centres in the Spanish-speaking environment and with a large number of students.

Table III shows the three most frequently consulted language versions for each centre. These data include size in bytes, number of words and number of visits received from January to March 2019. To monitor and measure collaborative impact we decided to only analyse the language which had the most active users, that is, the entry in the most visited language, and, as a second value, the length of the article itself. The official language of the institution has not been taken into account, but rather the language in which the university is most frequently read and edited. This is because our intention is to investigate the construction of an open discourse, regardless of the official nature of the educational institution itself or its intentions. This is why it is especially significant that a university (UPC) has as its primary language version in a language other than that of those official in that institution, since this implies that Internet users are freely creating a linguistic discourse about the institution itself.

The language that is most frequently visited and queried is Spanish (first in thirteen centres), followed by Portuguese, which is the first in all Portuguese-language universities (twelve), and the English version is most often accessed at a single university (UPC). However, the most widely used second language is English in all centres (except UPC). This language is once again the language with the greatest impact in Wikipedia (Claes & Deltell, 2019), since despite not being the official language of any of these institutions or that of any of the countries studied, it is highly used.

All Portuguese universities showed that Spanish was the third most frequently visited language. Institutions in the Basque Country and Catalonia show Basque (one) and Catalan (three) as the third most popular language. Finally, French appears as the third most used language in five Spanish universities and German appears in the same position in only one university.

Therefore, Wikipedia shows the impact of different languages in the creation of free content on Ibero-American universities. In first place is Spanish, which is the native or co-official language of most of these institutions. Spanish also has a great creative influence in Portuguese universities. Portuguese is a different case, since although it is the first language in Portuguese-speaking universities, it has little impact on articles about Spanish-speaking institutions. English, being the second most common language of all articles about universities except for one -which is the first-, indicates that it is the working language used in research and higher education (Martín Gutiérrez, 2010; Niño-Puello, 2013).

Furthermore, the relevance of English is not shown by the number of page views, but also by the size of the articles, as many Spanish and Portuguese universities have articles with more words in English than in the most widely used language. This is the case of the article on UAM, which in Spanish has 970 words but 2,400 in English. This is also true in the Portuguese sphere with UC, which has 2,013 words in Portuguese and 4,140 in English. This phenomenon does not happen in the American universities studied where the native language is significantly more present than English in almost all cases. For example, UBA has 5,542 words in Spanish and only 619 in English; UCH has 7,427 words in Spanish and 1,534 in English and USP has 4,544 words in Portuguese and only 2,354 in English.

When comparing the number of students in each school with the number of visits to the articles, significant relationships are not found, but a few are worth noting. The four most visited entries belong to the centres with the most students (UNAM, UBA, UCM, USP), a fact that was already partially evident through the linguistic diversity. However, the relationship between the size of the article and the number of students or the number of researches and teachers is less significant. Therefore, we cannot establish a direct correlation between articles with more bytes and/or words with a larger university community.

TABLE III. Description of the three most extensive entries according to language versions

Rank	University acronym	Total languages	1st language	Size in bytes	Number of words	Visits in the last 60 days	2nd language	Size in bytes	Number of words	Visits in the last 60 days	3rd language	Size in bytes	Number of words	Visits in the last 60 days
1	USP	33	pt	62.900	4.544	25.358	en	34.658	2.354	9.771	es	36.302	2.873	4.506
2	UB	47	es	32.742	1.777	11.826	en	20.613	1.905	7.742	ca	25.822	1.253	1.934
3	UNAM	47	es	90.653	4.186	66.329	en	64.766	3.350	24.876	fr	8.862	767	1.412
4	UAB	22	es	17.514	564	8.072	en	10.756	872	4.859	ca	38.769	2.802	1.687
5	UP	21	pt	21.425	1.334	3.872	en	13.560	907	3.566	es	18.034	1.522	869
6	UL	33	pt	43.565	2.818	5.831	en	9.249	358	4.816	es	4.151	179	718
7	UV	19	es	33.119	2.096	7.128	en	10.267	906	386	fr	3.496	77	749
8	UCM	48	es	98.086	7.634	29.603	en	42.437	2.150	13.018	fr	10.553	795	1.908
9	UAM	25	es	36.875	970	9.458	en	27.271	2.401	3.590	de	7.162	280	527
10	UGR	28	es	27.969	1.291	7.038	en	11.410	446	4.991	fr	22.842	1.795	1.179
11	UFRJ	37	pt	135.482	4.872	11.951	en	122.927	5.404	4.167	es	5.573	136	840
12	UNICAMP	15	pt	91.567	6.283	9.515	en	77.487	5.467	3.269	es	2.928	107	1.348
13	UNESP	9	pt	33.459	1.577	7.852	en	28.007	1.299	2.174	es	12.552	584	725
14	UC	43	pt	18.999	2.013	14.285	en	44.059	4.140	9.785	es	9.056	386	2.844
15	EHU/UPV	24	es	30.728	2.046	7.603	en	14.186	973	3.913	eu	12.672	236	571
16	UFRGS	8	pt	21.131	1.130	4.409	en	18.242	1.063	1.781	es	3.294	451	613
17	UBA	52	es	82.192	5.542	39.088	en	20.718	619	7.466	pt	9.103	471	3.022
18	UPF	18	es	14.814	961	8.460	en	10.176	615	5.146	ca	18.451	1.282	1.020
19	US	22	es	34.589	1.861	7.934	en	12.576	1.022	4.449	fr	22.174	1.497	1.932
20	UFMG	100	pt	56.573	3.969	5.965	en	29.958	3.099	1.745	es	4.918	361	531
21	UPC	19	en	12.772	351	4.543	es	14.994	847	3.781	ca	19.136	916	645
22	UCH	51	es	125.534	7.427	14.644	en	31.409	1.534	4.062	pt	3.132	168	648
23	PUC	26	es	69.536	4.784	13.383	en	17.278	751	4.538	pt	2.505	100	745
24	UA	12	pt	14.313	795	2.258	en	11.934	1.196	1.821	es	8.022	84	351
25	UNL	13	pt	22.306	698	2.820	en	8.389	624	2.370	es	2.314	134	342

Source: by the Authors

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Table III also allows us to measure the impact that international exchange plans may have on the creation of content in different languages. When studying the most widely established European exchange programme, the universities with the most Erasmus students (among those studied) are UGR, UCM and UV (European Commission, 2017), all three of which have higher relative scores for visits in English than they have in Spanish. In fact, UCM is the university that displays the greatest linguistic diversity in the website. However, these data can only serve as a reference since Erasmus+ is not available in American universities.

The main focus of our research is based on how the online community builds a free discourse (Open Authority) on Ibero-American universities without taking into account the intentions of the institution itself. Language use is already significantly relevant, but even more so is the authoring behaviour in the most active language version. Table IV provides the data on this measurement.

Creative activity is abundant and rich. There is significant participation in all articles on universities. Seven institutions have more than 400 editors and UNAM reaches 1139 editors. This means that there is a significantly large online community willing to write about these higher education centres. The open nature of this online discourse has been verified by the most popular language version. In fact, the article with the fewest direct contributions (ULN) reaches 82 different editors, which is already a considerable number for the creation of one encyclopaedia article.

Another key piece of data required to understand whether this is a real collaborative discourse is to study the average number of edits (average number of edits per editor), as well as the bytes printed per contributor. As can be observed, the number of entries averages around 2.5 edits (although at UC it reaches 4.67). This helps to understand the participatory and dynamic nature of the entries. Activity in terms of edits is also enormous; eight universities have more than a thousand edits. UBA has reached 2821 modifications in its article in Spanish. In fact, the average number of editors per entry in these articles exceeds 200, as a reflection the great interest within the community.

One of the most relevant facts about Wikipedia, and one that often goes unnoticed by research on online discourse, is the number of page watchers. These are users who request the virtual encyclopaedia to be automatically notified every time a change (whether significant or minor)

is made to a given entry. In other words, these are not only editors but also content creators concerned with avoiding vandalism and potential information manipulation. In this case there are again very significant results, eight articles on higher education institutions have more than fifty page watchers and some of them reach a very high number: UNAM (130), USP (78), UFRJ (77) UNICAMP (69), UBA (67), UCM (57) and UCH (53).

TABLE IV. Authoring behaviour in the most used language version

Rank	Acronym	Most visited language	No. edits	No. editors	Average edits per editor	Bytes per editor	Bytes per edit	No. references	No. of unique references	Inbound links	No. gatekeepers	Creation year	Consolidation year
1	USP	pt	1576	596	2,64	105,54	39,91	89	63	3722	78	2004	2011
2	UB	es	542	292	1,86	112,13	60,41	19	18	10704	32	2004	2008
3	UNAM	es	2821	1139	2,14	284,74	132,82	113	91	4582	130	2003	2006
4	UAB	es	429	229	1,87	76,48	40,83	5	5	1222	?	2006	2015
5	UP	pt	413	168	2,46	127,53	51,88	39	32	606	?	2004	2006
6	UL	pt	328	153	2,48	79,59	32,14	47	42	1107	45	2004	2013
7	UV	es	524	232	2,26	142,75	63,2	29	23	1633	34	2003	2007
8	UCM	es	1194	427	2,8	229,71	82,15	151	104	4219	57	2004	2013
9	UAM	es	874	330	2,65	111,74	42,19	16	15	1102	32	2004	2006
10	UGR	es	682	274	2,49	102,08	41,01	30	27	1321	38	2005	2015
11	UFRJ	pt	1539	361	3,04	248,15	81,54	253	249	1733	77	2003	2010
12	UNICAMP	pt	1123	369	2,62	114,19	43,51	197	143	1085	69	2004	2015
13	UNESP	pt	769	293	2,78	116,84	42,09	48	32	1387	38	2004	2005
14	UC	pt	417	227	4,26	375,3	88,03	15	10	2366	38	2005	2003
15	EHU/UPV	es	730	263	1,84	83,7	45,56	13	12	965	48	2005	2006
16	UFRGS	pt	431	194	2,56	166,04	64,87	19	17	1044	37	2004	2005
17	UBA	es	1267	495	2,22	108,92	49,03	71	65	3428	67	2003	2005
18	UPF	es	308	142	2,42	174,69	72,21	13	12	474	?	2006	2009

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19	US	es	479	198	2,85	193,74	67,91	47	35	1367	?	2004	2017
20	UFMG	pt	833	292	2,6	200,85	77,11	56	47	983	34	2005	2008
21	UPC	en	356	200	2,65	130,71	49,32	13	13	450	?	2002	2010
22	UCH	es	1628	625	2,17	104,32	48,1	195	185	3988	53	2004	2013
23	PUC	es	1410	532	1,78	157,05	88,23	55	44	1587	43	2004	2006
24	UA	pt	342	151	2,26	94,79	41,85	13	13	253	?	2004	2005
25	UNL	pt	183	82	2,23	272,02	121,89	50	41	456	?	2005	2015

Source: by the authors

A very interesting fact can be observed in this case: the UNAM article is once again the one with the most participation and activity, but some Brazilian centres with a low level of language diversity show, however, a frantic amount of activity in their main language (Portuguese). In other words, USP, UFRJ and UNICAMP, which in the data offered on language participation had reached average positions, are presented as some of the institutions where the main language version is written and discussed the most. Without a doubt, this is the result of two facts: firstly, the great impact of these institutions within an online university community, but at the same time, the lesser ability of these organizations to become established in other languages or to have an international impact.

Another significant item is the year of creation of the articles. All of them were introduced between 2003-2006, except for UPC, which was the first published and appeared in 2002. In other words, the online community soon realized the importance of these universities having articles on Wikipedia. The year in which the entry ceases to be a minor reference and becomes a true discourse with valuable information and broad and rigorous content is even more relevant. This period ranges from 2005 to 2015. There were articles that were quickly addressed by the online community while others took time to generate significant interest. By 2019, all universities have a substantial and meaningful entry in their main language version.

The consistency and impartiality of Wikipedia texts is based on the references used in their development. These citations facilitate the verification of information and act as a key element in understanding

the thoroughness of the content offered. Most of the entries concerning universities have been written with a large number of references. In some cases these exceed or almost reach up to two hundred consulted and cited sources, UFRJ (249) and UCH (195). The plurality of authoritative arguments shows the thoroughness of the construction of these articles. An interesting fact is that these citations are taken from different documents, in other words, that as far as possible one source is not referred to repeatedly, but several different sources that guarantee impartiality (or at least the plural creation of the discourse) are used. In this case too, the articles on Ibero-American universities show a large number of unique references.

Finally, and perhaps less discussed, one of the most significant factors in measuring the outreach and impact of a Wikipedia article is presented: the number of links to it. This figure reveals the network that is being constructed alongside other articles and other services that refer directly to the entry in the encyclopaedia to explain or detail information about the universities. In this case, the UB article presents the highest number of links with a total of 10,704. After it, the most frequently mentioned centres are once again found, UNAM, UCM, UCH, USP and UBA, all of which exceed three thousand incoming links. In contrast, UA and UPC only receive 253 and 450, respectively.

The number of links is in itself a clear indicator of the impact of the article and its ability to position itself as a respected authority in the virtual community. The average number of these links for articles on Ibero-American universities is 2000 links (only for the main language version), which implies that this discourse is recognized and accepted by the online community as a relevant narrative.

However, caution is needed when considering the development of free discourses on the Internet. Narratives must be completely impartial and should not be contaminated by the institutions themselves or by third parties, what is called conflict of interest (Wikipedia, 2019). The work of librarians and editors is key in achieving this goal. However, it could happen that an editor or a small group of editors are responsible for all the articles. This would not be a problem (although it would limit the collaborative approach) if these users were working impartially and following the Five Pillars of Wikipedia, but it would be a breach of its rules if these so-called main editors were the institution itself or biased.

TABLE V. Twenty most active editors on each Ibero-American university

Rank	Acronym	1st Language	Exclusivity	Primary interest	Anonymous IP	University IP	Blocked users	Percentage of edits
1	USP	pt	2	1	2	0		31,19
2	UB	es	3	1	2	0	1-UB	22,84
3	UNAM	es	4	1	5	2		19,09
4	UAB	es	4	1	7	2		24,36
5	UP	pt	4	3	6	2		45,17
6	UL	pt	0	2	3	0		34,15
7	UV	es	6	4	4	1	1-UV	27,62
8	UCM	es	3	2	3	1		29,97
9	UAM	es	7	2	9	0		26,09
10	UGR	es	7	1	2	2		32,36
11	UFRJ	pt	3	2	1	1		58,79
12	UNICAMP	pt	2	2	2	0		35,7
13	UNESP	pt	9	2	7	1		36,28
14	UC	pt	4	5	5	0		18,46
15	EHU/UPV	es	3	3	5	1		39,86
16	UFRGS	pt	2	2	3	0		33,64
17	UBA	es	1	2	2	0		27,61
18	UPF	es	4	4	7	0		42,53
19	US	es	2	4	5	1		36,95
20	UFMG	pt	8	1	6	0		40,31
21	UPC	en	8	1	5	2		21,06
22	UCH	es	2	5	3	1		29,2
23	PUC	es	2	5	4	0		35,87
24	UA	pt	10	2	1	0		30,4
25	UNL	pt	3	4	4	3		47,02

Source: by the authors

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In table V we study the twenty most active editors on each Ibero-American centre and use for categories to classify them: exclusivity, primary interest, anonymous IP and university IP. Additionally, if any users are banned due to vandalism or because they are identified as having a conflict of interest, this is noted in the table. Finally, the weight or percentage of the edits by these twenty contributors to the entire article on the study centre is specified.

As can be observed, only in two articles about these universities have two partial editors been detected and blocked, who were reported by the community itself. This is an almost irrelevant figure in a total of 500 editors studied. Similarly, very little anonymous user activity has been found from university campuses or IPs. Almost no anonymous editors have been involved from the universities' own IPs in a significant way (only in the UNL do they reach 15%). In most cases they are anonymous users who work from outside the IP of the university.

The percentage of edits written by these twenty most active users over the total of each article varies considerably from 18.46% generated about UC to 58.79% corresponding to their participation in the article about UFRJ. The average authorship percentage of the twenty most active users is 33%, which is just one third of the article. Therefore, it seems obvious that it is possible to speak of real collaborative work without a sole dominant editor, since the twenty most active wikipedians generate only a third of the total discourse.

However, we do perceive one negative fact in some of the articles, especially in Portuguese-speaking countries. AU has ten editors who have published exclusively about the university itself. This is not penalised by Wikipedia guidelines but is an example of uncooperative and largely self-serving work as wikipedians are mainly characterised by the development and creation of a variety of topics, subject areas and articles. When the user only writes about an institution, this does not imply that he or she has a conflict of interest, but it does reduce its independence. However, only six universities have seven or more exclusive editors.

Conclusions

We provide our conclusion of the article based on the research questions asked:

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Presence. As explained, all articles on Ibero-American universities clearly surpass the first research question. The linguistic diversity and the language versions available are extremely broad. Remarkably, UFMG has been able to reach a hundred different languages, but the truth is that its entries in most languages are merely symbolic. However, at least five universities achieve more than thirty meaningful and active language versions. And, on average, all universities have entries in thirty languages, even if some only provide basic information. The primary language used is Spanish, which is the preferred language for articles about universities whose official or co-official language is Spanish, except in one case, and is third in all Portuguese-speaking institutions. The second most used language is Portuguese which is logically in first position in all Brazilian and Portuguese universities but its presence is marginal in the Spanish environment. The third main language is English which in some respects even surpasses the two official languages.

Activity. The average content activity is high. Articles are continuously edited. All of them were created between 2002 and 2005 and since then they have undergone a great number of revisions, improvements and changes. We can speak of ongoing and consistent work. The average increase in content is relevant for all pages and edits are still being improved with reasonable frequency.

This research does bring out a negative fact, the articles on six universities present a relatively high rate of exclusivity, between 7-10 users write only about the institution in question. This does not breach the Wikipedia ethical code, but reveals that they are non-collaborative articles that do not support the fully open nature of Wikipedia. However, this is a rare event in five universities and only in one of them does it appear in a more serious way. Significantly, it mainly takes place in relatively small universities.

Debate, construction and participation. The average amount of participation and the number of edits is truly large and a rich online community is found. There are more than 1,400 editor in the UNAM entry. These figures are confirmed by the study of the activity carried out by page watchers who are present in all articles studied. There are no instances of vandalism or biased control over the discourse. On the contrary, the narratives offered on Wikipedia about Ibero-American universities have not endured significant vandalism nor have they been produced by the institutions themselves, but by a large number of disinterested users.

This research does not aim to establish a ranking of Ibero-American universities in Wikipedia but it does show that the articles on five institutions are significantly more active, collaborative and creative. They are ranked by the amount of activity, although the order could be different if the page watchers or editors were taken into account: UNAM, UCM, UBA, UCH and USP.

The number of links to articles on Ibero-American universities (an average of more than 2,000) also indicates that this is an authoritative discourse recognized by the online community. Therefore, this research seems to confirm that an open and authoritative discourse on universities has been created in Wikipedia. It is a collaborative effort, that is highly participative and recognized by the online community as being of high quality and authoritative.

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Group programs of positive parenting: a systematic review of scientific production

Programas grupales de parentalidad positiva: una revisión sistemática de la producción científica

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Abstract

The exercise of parenting is currently perceived as a difficult task, due to its complexity, the diversity of family forms and the challenges brought about by the changes of the last decades. Research suggests that parents need training and support in order to raise, educate and socialize their offspring. A solution to these needs may be found in parental education offered from the perspective of positive parenting. This study aims to show a global and general map of the scientific production related to group parental education programs. To do so we have carried out a systematic review following the guidelines of the PRISMA guide and the Cochrane and Campbell collaborations. The search is limited mainly to articles in English and Spanish and published in refereed journals between 2006 and 2019. Eight electronic databases were consulted: ERIC, MEDLINE, SCOPUS, WOS, SCIELO, KCI, PsycARTICLES and PsycINFO. After the selection process, 245 research articles were included. The results highlight the most prolific authors, the journals with the most publications and the 48 countries where research had been carried out, belonging to America, Oceania, Europe, Asia and Africa. Regarding the design of the studies, 60% were pre-experimental or quasi-experimental. We have also identified 115 group interventions that were implemented and evaluated. What we find is a growing trend in scientific production on the subject, and this includes the discovery of research carried

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out in lower income countries. In addition to observing that not all interventions were in the same stage of consolidation, we have also identified those programs that have been most widely implemented and evaluated internationally. These programs, which tend to coincide with those defined as models by reference guides, are complemented by other promising approaches.

Key words: systematic review, parental education, positive parenting, group interventions, evidence-based programs.

Resumen

El ejercicio de la parentalidad se intuye en la actualidad como una tarea difícil, tanto por la complejidad que encierra, como por la diversidad de formas familiares y los retos que implican los cambios de las últimas décadas. La investigación sugiere que los progenitores precisan de formación y apoyos para llevar a cabo la crianza, educación y socialización de sus vástagos. A estas necesidades podría dar respuesta la educación parental desde el enfoque de la parentalidad positiva. El presente estudio pretende mostrar un mapa global y general de la producción científica relacionada con los programas grupales de educación parental. Para ello se ha ejecutado una revisión sistemática siguiendo las directrices de la guía PRISMA y de las colaboraciones Cochrane y Campbell. La búsqueda se ha limitado fundamentalmente a artículos en inglés y español y publicados en revistas arbitradas entre 2006 y 2019. Se han consultado ocho bases de datos electrónicas: ERIC, MEDLINE, SCOPUS, WOS, SCIELO, KCI, PsycARTICLES y PsycINFO. Tras el proceso de selección, se han incluido 245 artículos de investigación. Los resultados han destacado los autores más prolíficos, las revistas con más publicaciones y 48 países donde se habían desarrollado las investigaciones, pertenecientes a América, Oceanía, Europa, Asia y África. En cuanto al diseño de los estudios, el 60 % han sido pre-experimentales o cuasi-experimentales. También se han identificado 115 intervenciones grupales implementadas y evaluadas. Por tanto, se ha apreciado una tendencia creciente en la producción científica sobre el tema, se han descubierto investigaciones ejecutadas en países de menores ingresos, se ha constatado que no todas las intervenciones se encontraban en la misma etapa de consolidación y se han localizado los programas más implementados y evaluados internacionalmente, que parecieron coincidir con los definidos como modelos por guías de referencia, así como otros prometedores.

Palabras clave: revisión sistemática, educación parental, parentalidad positiva, intervenciones grupales, programas basados en evidencias.

Introduction

The changes occurring over the last decades have left a mark on present-day families (Grau y Fernández, 2015). These alterations can be seen in new family forms, in the concept itself of the educational, developmental and socializing family context and in the advent of the call for professional intervention in such matters (Palacios, 2016).

These changes translate into needs that previously tended to go undetected, and to a greater visibility of – and urgency to address – those needs identified within the family, beginning with support and guidance for the parents (Vaquero, Suárez, Fernández, Rodrigo and Balsells, 2019).

It is this context that led to the formulation by the Ministerial Committee of the European Council of Recommendation 19 on Policy to Support Positive Parenting (European Council, 2006). This organism urged member states to develop and implement measures in support of families, including programs in parental education. The adoption of these measures was meant to improve domestic harmony while at the same time protecting children's rights and contributing to their future society's prosperity (Martínez and Becedóniz, 2009). The Commission subsequently published Recommendation 112 (European Commission, 2013), which stresses the importance of helping mothers and fathers develop parental skills which will serve to ensure that their children and adolescents will be brought up in a surrounding that is favorable to their development. The *American Society for the Positive Care of Children* (2019) works along very similar lines.

From this perspective we should start by affirming that parenting consists of the use of certain practices for the rearing and educating of children by their educators. The adjective *positive* refers to the notion that the adults' behavior must always have as its goal the overall well-being and development of the child and that it should be based on affection, structure, stimulation, recognition, empowerment and non-violence (Rodrigo, Máiquez and Martín, 2010; Rodrigo, 2015). Consequently, a minor ought to be considered an active subject rather than a passive receptor of needs that parents and other social agents are there to satisfy. But the needs of mothers and fathers are also taken into account; these include care of one's self, reflection and reorientation regarding the family educational model, time with the family and time by one's self, confidence and satisfaction with parental duties, formal and informal support aimed at reducing stress and overcoming difficulties, etc. (Rodrigo et al, 2015).

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In response to these considerations, a number of proposals have emerged for providing support for families, proposals that fit into three basic formats: individualized attention and home visits; group support; and community support (Rodrigo, 2015).

The group programs of positive parenting include active training in skills for developing competence and self-confidence in parents so that they may undertake child rearing in an affectionate, consistent, reliable and non-violent way. These skills go beyond the mere transmission of knowledge about the different stages of the child's development or dealing with certain disorders or learning techniques for modifying conduct. Research has shown that improvements in the way that parents raise and educate their children are reflected in a reduced rate of socio-emotional problems and behavioral problems in childhood and adolescence. This is why it is so important that group interventions encouraging positive parenting strive to reduce those risk factors that could have adverse effects on children (such as severe disciplinary practices, be they verbal or physical), fostering instead protective approaches that will lead to positive, reassuring results for the family (Haslam, Mejía, Sanders and De Vries, 2017; Nelsen, 2006; Rodrigo, 2015). However, this approach has been questioned for several reasons. One is its substantial psychological content, which could be seen as trying to supplant educational content (Fontana, Gil y Reyero, 2013). There are also discrepancies about what objectives and topics should be dealt with in education taking place within the private family setting. Doubts have also been expressed as to how effective the principles of positive parenting are for forming and training mothers and fathers (Bernal y Sandoval, 2013).

We have, then, a variety of institutions, businesses and other organisms offering support for families and, more specifically, for mothers and fathers (Rodrigo, 2016). However, not all interventions are based on evidence (Páramo y Hederich, 2014); in order to do so they would have to adhere to criteria guaranteeing a minimum of quality and success, in other words, criteria based on a diagnosis of valid needs and practices that can help guide the design, implementation and evaluation of the program (World Health Organization, 2014).

All of this makes it crucial that we rely on the most accurate evidence, although this in itself is complicated for several reasons. While there has been an exponential increase in the number of studies carried out on the subject, a revision of traditional narratives has been lacking, ultimately

leading to a deficient, biased accumulation of scientific knowledge. The role of primary studies in the advancement of our knowledge has also been limited, leaving us with what amount to little more than pieces of puzzle (Botella y Sánchez-Meca, 2015).

In this sense, systematic reviews and meta-analysis could represent the standard reference for integrating, synthesizing and critically analyzing the scientific evidence available with regard to these interventions (Botella and Sánchez-Meca, 2015; Higgins and Green, 2011).

At this point a number of reviews – narrative, systematic and meta-analytical – have been carried out on parental education programs. César and Rey (2006) differentiated between programs aimed directly at optimizing parents' practices and those meant to improve their well-being, which in turn would favor positive parenting. These authors noted that parental education programs had been used mostly to deal with problems in children's behavior and as a way of supporting mothers and fathers who found themselves in a precarious psycho-social state.

Robles and Romero (2011) pointed out that the parental interventions reviewed evidenced considerable effectiveness; in addition to encouraging positive changes in the children's behavior, they demonstrated an improvement in parent's interventions with their offspring, progress in the family dynamic and in the resolution of problems, greater communication and a reduction in parental stress.

Barlow, Smailagic, Huband and Roloff (2012) pointed to the fact that the programs for parental empowerment were shown to have had an impact in children's behavioral and emotional adjustment. This was accompanied by positive effects in the general well-being of the adults, although this improvement was short-lived and did not last.

Given how the preventive strategies of parental programs had proved effective in countries with a high standard of living, Mejia, Calam and Sanders (2012) set out to review the literature on programs for child-rearing in developing countries. They soon discovered that research on the effectiveness of such programs was very limited in poorer countries, encountering one single study with a solid methodology dealing with the prevention of emotional and behavioral problems.

In 2015 Pérez and Yániz analyzed and compared the characteristics of 15 parental education programs, most of which followed an experiential or technical approach. The authors discovered that the aspects of the programs in most need of improvement were the evaluations of the

interventions and the training of the people implementing them.

Pisani and Martins (2016) reviewed 23 studies, all about group programs focused on preventing violence and abuse by encouraging positive child-raising practices. Only seven of the studies were random, controlled trials. Eighteen of them evaluated child-rearing strategies, while 90% of the total registered a significant improvement in the children's conduct.

Lozano and Valero (2017) analyzed 48 scientific articles dealing with the efficiency of parent training programs. Their study showed that the interventions were beneficial, resulting in a reduction in young people's behavioral problems and in child abuse along with an improvement in parental skills and in child-rearing strategies.

Valero, Ballester, Orte and Amer (2017) analyzed evidence concerning family-based programs of selective prevention relating to drug consumption in adolescence. The authors worked with nine studies, the results of which showed a considerable effect size in terms of family relations, positive parenting and substance abuse.

Licencín, Martín and Rama (2017) examined 13 scientific articles and found that a majority of the studies coincided in corroborating the beneficial effects of positive parenting. Among these favorable results were the parents' adopting more democratic child-raising habits – as opposed to negligent or overly permissive ones -, an increase in assertiveness, improved communication with the rest of the family members, and more effective conflict resolution. The fact that parents also felt more satisfied with the job they had done raising their offspring was reflected in their increased self-esteem and self-efficacy, lower levels of parental stress and a better overall family atmosphere. All of this was accompanied by a lower rate of childhood behavioral issues.

And finally, Ruíz, Serrano and Mújica (2018) reviewed the evidence regarding the efficiency of interventions aimed at increasing parents' competence and skills as they relate to the healthiness of the minors' lifestyle. Of the 15 studies they analyzed, carried out between 2003 and 2016, nine took place in the United States, four in Europe and two in Asia. Parental self-efficacy was the principal construct evaluated in these scientific articles, most of which did not include control groups. Four of the studies registered an increase in parents' self-efficacy.

Along the lines of what has so far been shown here, this study aims to obtain an up-to-date, panoramic vision of scientific production relating to the implementation and evaluation of group programs on parental

education, more specifically, of those based on positive parenting. We believe it is crucial to detect and analyze such programs (Rodrigo, 2016) and to compile information from the primary studies relating to the subject, some of which have shown the efficacy of certain programs outside of prosperous countries (World Health Organization, 2014). We also believe that the results of this systematic review may serve to provide educational counselors and family members with a selection of parental education programs of proven effectiveness that could potentially prove ideal for demographic samples that they may be working with.

In consequence with what has been laid out above, we would like to formulate the following research question: what is the current state if international scientific production relating to the implementation and evaluation of group programs based on positive parenting? In order to respond to this question we propose as our general objective a systematic review of the available scientific evidence regarding group programs based on positive parenting offered to parents of children and adolescents. Our specific goals are: a) to identify research articles dealing with the implementation and evaluation of group programs of parental education; b) to analyze the evolution of this scientific production, based on the year of publication; c) to determine which scientific journals have published the most articles on the subject; d) to determine the contingency of the appearance of the scientific articles reviewed in the different data bases consulted; e) to identify the most prolific authors on the subject, as well as the institutions and countries where they have carried out their professional work; f) to identify tendencies regarding the number of authors of the scientific articles included in the review; g) to identify the countries where the interventions have been applied and evaluated; h) to provide a classification of the articles based on the language of publication and the research design employed; i) to identify the most often used key words; j) to draw up a list of the programs that have been implemented and evaluated most often.

Method

To carry out this systematic review of interventions we followed the guidelines of the PRISMA guide (Moher et al., 2009; Moher et al., 2015; Shamseer et al., 2015) as well as the Cochrane indications (Higgins and

Green, 2011) and Campbell indications (The Campbell Collaboration, 2019). We should point out that systematic reviews are a form of research in themselves; they attempt to identify, synthesize and critically analyze the features, results, conclusions and other aspects of different primary studies, which, by means of a previously designed, systematic process, then serve to respond to concrete questions. The entire process follows an explicit, rigorous methodology. The sample units of these systematic reviews consist of each and every one of the original studies included in the format we have established. For this study we have limited the search and selection of articles to those published in refereed journals.

Protocol and registry

There is a preliminary and final protocol (Rubio, 2019, 2019c) of the systematic review, whose publications serve as a register.

Eligibility criteria

The studies included in this systematic review were published, in Spanish or English, in scientific journals between 1 January 2006 (the year in which Recommendation 19/2006 appeared) and 28 February 2019.

Furthermore, the eligibility criteria, based on the PICOS format (*population, intervention/exposure, comparator, outcome, study characteristics*), included the following: a) participants: fathers and mothers with male or female children between the ages of 0 and 18 (legal guardians, grandparents, etc. were also admitted); b) intervention: group programs of parental education; c) comparison: measures taken pre and post intervention; d) results: quantitative; e) characteristics of the studies: pre-experimental, quasi-experimental and experimental designs.

Information sources

Eight electronic databases were explored for the review: WOS, SCOPUS, PsycINFO, PsycARTICLES, MEDLINE, ERIC, KCI y SCIELO.

We chose the databases ERIC, PsycARTICLES and PsycINFO, owing to the fact that they are specialized in education and psychology; we selected Web of Science and SCOPUS due to their being the databases that bring together references from the principal scientific publications in all fields of knowledge; MEDLINE was chosen because it has the world's most complete medical bibliographical database and because many parenting interventions, insofar as they address questions of prevention and health, are approached from the fields of nursing and medicine; Korean Journal Database provided an Asian database whose contents are presented in English; and finally, SCIELO was included as it provided a database associated with scientific journals from Latin American countries and South Africa.

Search strategies

The terms used were: "positive parenting", "positive parenthood", "parent* education", "program*", "intervention*".

Before defining the search terms we first established the principal topics relating to group programs of positive parenting. We then performed a preliminary search of literature in two databases (WOS and ERIC) in order to find key words included with the articles as well as terms appearing in the titles. Next, we drew up a list of descriptors with the most frequently appearing terms, freely chosen synonyms and thesaurus terms relating to the research topic. All of these elements were used to create a search strategy, which was adapted to each of the databases consulted.

Chart I shows the different search strategies used, allowing for their replication.

CHART I. Complete electronic search strategies, in accordance with the different databases

Database	Limiters	Search equation
ERIC, PsycARTICLES, PsycINFO	Articles from journals, refereed publications	TX "positive parenting" OR TX "positive parenthood" OR TX "parent* education" AND TX ("intervention*" OR "program*")
Web of Science, MEDLINE, KCI, SCIELO	Articles from journals, refereed publications	TS= ("positive parenting" OR "positive parenthood" OR "parent* education") AND TS= ("program*" OR "intervention*")
SCOPUS	Articles from journals, refereed publications	(TITLE-ABS-KEY ("positive parenting" OR "positive parenthood" OR "parent* education") AND TITLE-ABS-KEY ("program*" OR "intervention*"))

Source: prepared by the authors

Selection of studies

The process of selecting the studies consisted of four phases:

- Phase 1 or identification phase (February 2019): systematic searches were carried out on the eight databases.
- Phase 2 or screening phase (March-April 2019): the references from the identification phase were exported to the bibliographical manager *RefWorks* (RefWorks, 2019), eliminating the duplicated documents. Then the references deemed potentially relevant to the systematic review were preselected. This was done by examining titles and summaries and in accordance with the eligibility criteria.
- Phase 3 or eligibility phase (May-June 2019): preselected articles were read in their entirety and subjected to a *checklist* (Rubio, 2019b), which served to verify the relevance of the chosen article. Those meeting all of the criteria passed on to the next phase. The process was registered on an *Excel* calculus sheet that recorded: the identification number of the article, title, year, authors, databases where it appeared and the eligibility criteria that it met.
- Phase 4 or inclusion phase (July 2019): a definitive decision was taken as to which studies were to be included in the systematic review. Given that it is not unusual for a single study to give rise to

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the publication of different scientific articles, we chose to use the different articles based on one same study.

A summary of the studies selected in each stage of the process of study selection is shown in a flow chart.

Finally, we proceeded to extract, gather and compile the data from each article in the codification phase.

The process of extracting, gathering and compiling data

Once the definitive selection of studies was made in the inclusion phase, data was extracted from each of the articles by means of an online form, *Google Forms*. This was after the articles were sent to a file folder of numbered *pdf* documents.

Having extracted the data, and for the purpose of analyzing and synthesizing the studies, we used charts and diagrams from the programs *Excel 2013* and *IBM SPSS Statistics 25*.

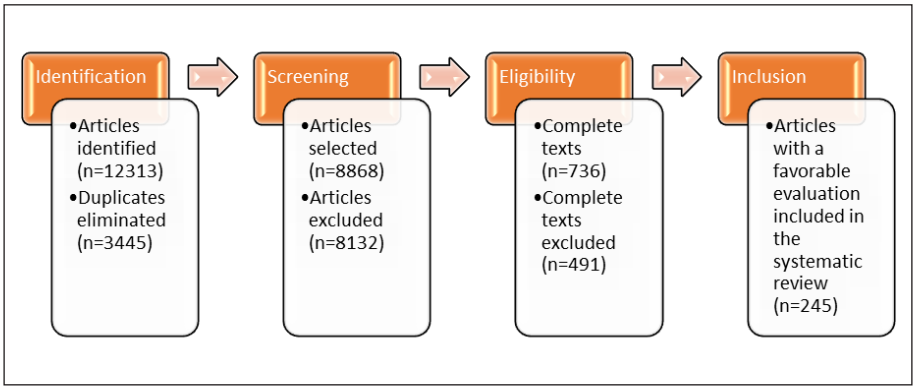
Data list

The variables for which we extracted data for this review were: name and number of authors; professional affiliation and country; year of publication of the article; title of the article; name of the journal where the article was published along with the number of articles published in said journal; database or databases in which the article appears together with the contingency of its appearance; language of publication; type of access to the journal (whether open or restricted); key words; country where the study was carried out; names of the group programs of parental education implemented and evaluated along with their authors and the research design.

Results

Chart I provides a summary of the study selection process and its four phases.

CHART I. Flow chart of the study selection process



Source: prepared by the authors

Our preliminary bibliographical search in the eight databases named above resulted in a total of 12,263 articles. 59,6 % of these were from the SCOPUS, PsycArtICLES and Web of Science databases.

The search revealed a difference between the number of articles published in restricted access mode (77,27 %) and open access mode (22,73%), depending upon the database consulted. Thus, the electronic databases with the greatest percentage of studies to which open and complete access was possible (94,27%) proved to be ERIC, SCOPUS, Web of Science and MEDLINE.

Once the duplicated articles had been eliminated, 8,868 references were screened, after which 736 reports passed on to the phase of eligibility.

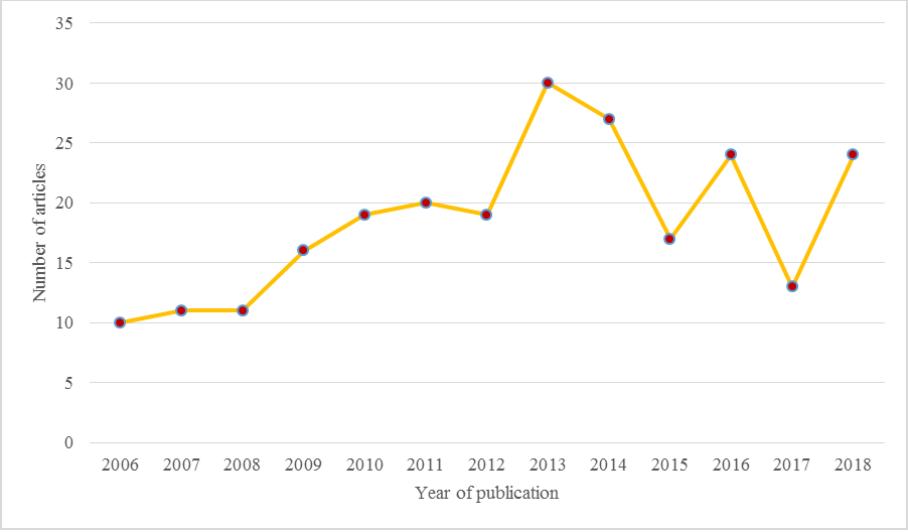
The complete text of these publications was examined to determine whether they met the inclusion criteria from the verification list. This process resulted in 491 articles being rejected.

Finally, 245 articles were selected for this systematic review. These articles may be consulted at https://doi.org/10.6084/m9.figshare.9199376

As can be observed in Chart II, there is an appreciable increase over time in the scientific production dealing with the implementation and evaluation of positive parenting programs. The apex of this tendency can be found in the year 2013, when 30 articles were published on the

topic. Some 55% of the articles were published in the last six-year period included in the review (2013-2018) and four more in the first two months of 2019.

CHART II. Evolution of scientific production.



Source: prepared by the authors

As for their provenance, the articles appeared in a large number of different journals, 138 to be exact. Chart II lists those journals that published four or more articles. The second, fifth and twelfth journals listed are specialized in education and social sciences.

CHART II. Journals with four or more articles on the subject

Journal	Number of articles
Journal of Child and Family Studies	14
Children and Youth Services Review	10
Prevention Science	8
Behaviour Research and Therapy	7
Research on Social Work Practice	7
Journal of Children's Services	6
Psychosocial Intervention	6
Journal of Child Psychology and Psychiatry	5
Behavior Therapy	4
Child Abuse & Neglect	4
Child Youth Care Forum	4
Journal of Clinical Child & Adolescent Psychology	4
Journal of Family Psychology	4
Research in Developmental Disabilities	4

Source: prepared by the authors

With regard to the databases in which the scientific articles were catalogued, Chart III shows the contingency of the articles' appearance in them along with the frequency of their exclusive presentation. As can be observed, the greater frequencies correspond to the articles appearing in the WOS and SCOPUS databases. The ERIC database, which is specialized in education, has the greatest number of exclusive articles.

CHART III. Contingency of articles' appearance in different databases.

	Exclusive	Also in WOS	Also in SCOPUS	Also in PsycINFO	Also in PsycARTICLES	Also in MEDLINE	Also in ERIC	Also in KCI	Also in SCIELO	Total
WOS	22	---	90	25	4	43	9	0	6	126
SCOPUS	34	90	---	24	4	41	13	0	5	137
PsycINFO	7	25	24	---	0	9	2	0	3	35
PsycARTICLES	5	4	4	0	---	3	0	0	0	10
MEDLINE	9	43	41	9	3	---	3	0	1	59
ERIC	48	9	13	2	0	3	---	0	0	64
KCI	0	0	0	0	0	0	0	---	0	0
SCIELO	1	6	5	3	0	1	0	0	---	7

Source: prepared by the authors

As for the authorship of the articles, their professional affiliation and the country of the institutions where they work, we will mention here the most prolific researchers – those with three or more articles published.

In first place we find the scholars from the University of Queensland (Australia), with Matthew R. Sanders (23 publications), Kate Sofronoff (10), Felicity L Brown (5), Alina Morawska (3) and Koa Whittingham (3).

Leading the field in the United States are Carolyn Webster-Stratton at the University of Washington Seattle (5), Brian Wymbs of the University of Ohio (5), Paul R. Smokowski of the University of North Carolina at Chapel Hill (3), Martica L. Bacallao of the University of Kansas (3), William E. Pelham of Florida International University (3), Anil Chacko of New York University (3) and Angela Moreland of Begle Medical University of South Carolina (3).

The Spanish authors with the greatest number of articles published were Sonia Byrne (4) and María José Rodrigo (3), both at the Universidad de la Laguna, and Noelia Vázquez (3), Lucía Artazcoz (3) and Pilar Ramos (3), of Barcelona's Agencia de Salud Pública (Agency for Public Health) and at the University of Barcelona.

Karen Jones (7) and Judy M. Hutchings (4), both at the University of Bangor, along with Frances Gardner (4) and Tracey Bywater (4), from the

University of Oxford and the University of York, respectively, were the most-published authors in the UK.

German authors with the greatest number of articles published were Nina Heinrichs from the University of Bielefeld (4), Julia Plück of the University of Cologne (4), and Heike Bertram and Sebastian Naumann of the Technical University Braunschweig (both with 3 articles).

In Portugal, four authors from the University of Coimbra published three articles each: Andreia Fernandes Azevedo, Maria João Seabra Santos, María Gaspar and Tatiana Homem.

Cynthia Leung of the Polytechnic University of Hong Kong (8) and Sandra Tsang of the University of Hong Kong (3) were the preeminent authors from the Chinese sphere.

And finally, representing various countries, we have Gail Chislett of the Health Promotion Division, Peterborough County-City Health of Canada (3), Jean E. Dumas of the University of Geneva, Switzerland (3) and Louise J. Keown of the University of Auckland, New Zealand (3).

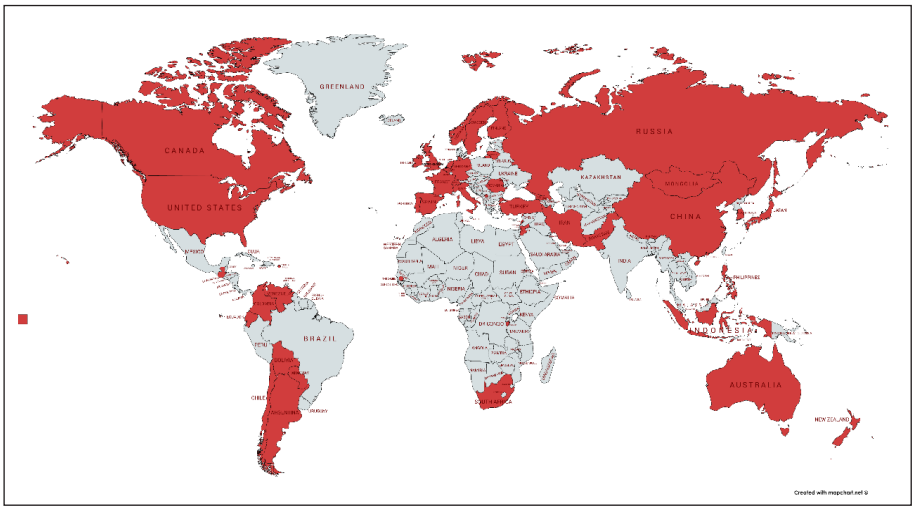
With regard to the number of authors contributing to an article, there is a clear prevalence of those written by three or four researchers (53 %). The maximum number of authors of a single article was 14 (0,4%) while those signed by the minimum – a single author - represented 3,3% of the total. The average was 4,19, the median 4, the mode 3 and the standard deviation was 2,17. El número máximo de firmantes de un mismo texto fue de catorce autores (0,4 %) y el mínimo de un autor (3,3 %). La media fue de 4,19, la mediana de 4, la moda de 3 y la desviación típica de 2,17.

Insofar as the provenance of the 245 published articles, the leading country was the United States (81), followed by Australia (27), Spain (16), China (14), Germany (12), Canada (11), United Kingdom (11), Netherlands (7), Iran (5), Ireland (5), New Zealand (5),Norway (5),Portugal (5) and Turkey (5).

Sweden, Romania and South Korea had three references each, while Japan, Singapore and South Africa are each represented with three articles. A considerable number of countries (Argentina, Belgium, Bolivia, Burundi, Chile, Colombia, Ecuador, Finland, France, Gambia, Georgia, Guatemala, Indonesia, Italy, Jordan, Kosovo, Lebanon, Lithuania, Mongolia, Pakistan, Paraguay, Palestine, Philippines, Puerto Rico, Russia, Solomon Islands, Switzerland and Venezuela) were represented with a single article.

Chart III shows the geographical distribution of the 48 countries where research was published.

CHART III. Countries with publications.



Source: prepared by the authors

With regard to the language in which they appeared, 238 of the articles (97,1%) were published in English while 7 (2,9 %) were published in Spanish.

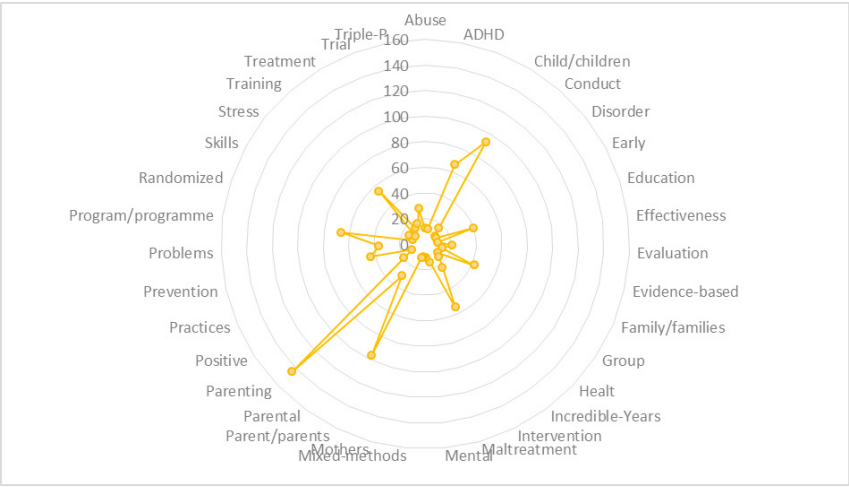
As for the design of the studies, six out of ten were pre-experimental or quasi-experimental (n=146). The purely experimental type was less common (n=99).

An interesting aspect of the articles has to do with the key words used with them. The frequency of the terms is shown in Chart IV, ten being the minimum number of repetitions for the key word to be included.

An analysis of the key words used in the articles allowed us to obtain a lexical group that would seem to characterize this field of research. It is important to take into account the use of synonyms (for example, *program*, *programme*, *intervention*) as well as abbreviations and acronyms (for example, *randomised* and *RCT*), given that the purpose of the key words is to identify research work in search engines and databases. The use of these terms which, while not identical, are in effect equivalent, can complicate such searches. The repetition of several dozen key words seems to indicate a degree of progress in this line of work. We

would hope that these results may help authors and readers to hone and perfect their search practices in the field of parental education.

CHART IV. Key words most often repeated in the scientific articles reviewed.



Source: prepared by the authors

Finally, we identified the parental education programs that were implemented and evaluated in the different studies. In the 245 scientific articles reviewed we discovered the use of 115 different programs. However, 28 of these were repeated in two or more publications, as can be observed in Chart V. In other words, these programs appeared in 66,5% of the publications included in the systematic review. The other group interventions that were identified can be consulted at https://doi.org/10.6084/m9.figshare.9199517

Matthew Sanders, for instance (*Positive Parenting Program,* or *Triple-P*) appears in 50 scientific articles, either as Triple-P or in combination with other versions or variants such as *All Day*, *Brief Parent Discussion Group*, *Building Bridges*, *Family Transitions*, *Gifted and Talented*, *Grandparents, Pathways*, *Primary Care*, *Seminar Series*, etcetera.

The *Incredible Years Parent Training* of Carolyn Webster-Stratton's is referenced on 33 occasions, while the *Strengthening Families Program*,

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by Karol Kumpfer, Virginia Molgaard and Richard Spoth, is referenced 8 times. The latter program has been adapted and used in Spain and Latin America, whose versions are known as *Programa de Competencia Familiar* and *Familias Fuertes*, respectively.

The *Parent management training Oregon Model (PMTO),* conceived and developed by Gerald R. Patterson, Marion Forgatch and other collaborators from the Oregon Social Learning Center, appears referenced 7 times, while the *Mindful Parenting training* of Susan Bögels and Kathleen Restifo appears on 5 occasions. .

The *Programa-Guía para el Desarrollo de Competencias Emocionales, Educativas y Parentales* (*Program-guide for the development of emotional, educational and parental competencies*) by Raquel-Amaya Martínez is mentioned in four articles, as is the program *Adults and Children Together-Parents Raising Kids*, by Julia Silva.

The following programs were included in a variety of publications three times: *Nobody's Perfect* (developed by Health Canada and the Departments of Health of the four Atlantic Provinces); *Community Parent Education Program* (by Cunningham, Bremmer and Secord- Gilbert); *Partners in Parenting* (designed and promoted by Colorado Family Education, Resources and Training and the University of Colorado); *Parenting our Children to Excellence* (by Jean Dumas) and its adaptation for the Spanish-speaking context (Criando a Nuestros Hijos hacia el Éxito); Apoyo Personal y Familiar – Personal and Family Support - (de María José Rodrigo, María Capote, María Luisa Máiquez, Juan Carlos Martín, Guacimara Rodríguez, Patricia Guimerá and Margarita Peña); *Hands-On Parent Empowerment Program* (by Leung, Tsang, Dean and Chow); *Parenting Wisely* (by Gordon); *Strategies to Enhance Positive Parenting (*by Anil Chacko, Brian Wymbs, Lizette Flammer-Rivera, William Pelham, Kathryn Walker, Fran Arnold, Hema Visweswaraiah, Michelle Swanger-Gagne, Erin Girio, Lauma Pirvics and Laura Herbst); *Behavioural Parent Training* (by Barkley, Wells, Abikoff, Abramowitz, Courtney, Cousins, Del Carmen and others); and *Prevention for Externalizing Problem* (by Plück, Wieczorrek, Wolff Metternich and Döpfner).

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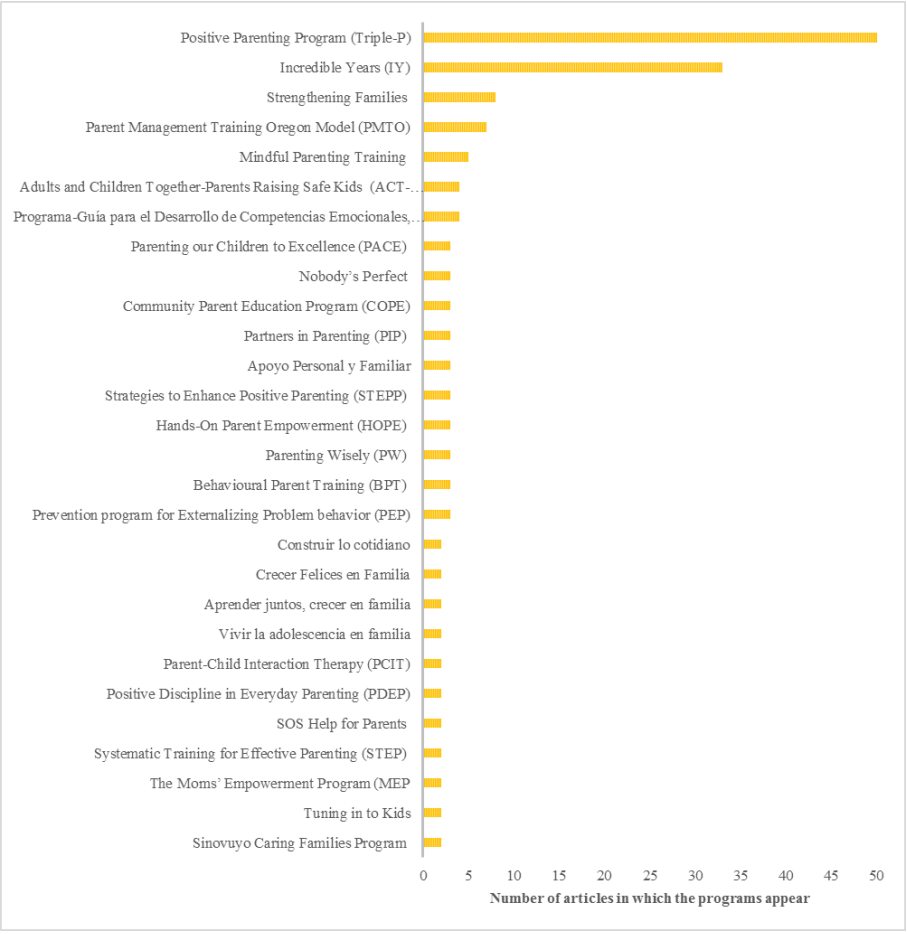
CHART V. Most often implemented and evaluated parental education programs



Source: prepared by the authors

Appearing twice were the following programs: *Construir lo cotidiano* (by Susana Torio, José Vicente Peña, María del Carmen Rodríguez, Carmen María Fernández, Susana Molina, Jesús Hernández and María de las Mercedes Inda); *Crecer Felices en Familia* (by María José Rodrigo, María Luisa Máiquez, Sonia Byrne, Beatriz Rodríguez, Juan Carlos Martín, Guacimara Rodríguez, Laura Pérez); *Aprender juntos, crecer en familia*

(by Pere Amorós, Núria Fuentes, Ainoa Mateos, Crescencia Pastor, M.ª José Rodrigo, Sonia Byrne, M.ª Àngels Balsells, Juan Carlos Martín and Mónica Guerra); *Vivir la adolescencia en familia* (by María José Rodrigo, Juan Carlos Martín, María Luisa Máiquez, Miriam Álvarez, Sonia Byrne, A. González, M. Guerra, M.A. Montesdeoca and Beatriz Rodríguez); *Parent-Child Interaction Therapy* (by Sheila Eyberg); *Positive Discipline in Everyday Parenting* (developed by Save the Children and Joan Durrant); *SOS Help for Parents* (by Lynn Clark); *Systematic Training for Effective Parenting* (by Don Dinkmeyer Sr., Gary McKay and Don Dinkmeyer Jr.); *The Moms' Empowerment Program* (by Graham-Bermann); *Tuning in to Kids* (by Havighurst and Harley); and *Sinovuyo Caring Families Program* (by Jamie Lachman, Liora Sherr, Lucie Cluver, Catherine Ward, Judy Hutchings and Frances Gardner).

Finally, we should like to remark that many of these programs deal with the awareness of the personal and behavioral characteristics of minors that stem from their stage of development and their life circumstances. They also touch upon the parents' skills in emotional self-control, their self-esteem and their assertiveness. The programs tend to focus on facilitating strategies for meaningful communication, for negotiating and for the resolution of conflicts and for establishing clear and coherent rules, limits and consequences, all in the name of achieving discipline and a positive relationship between parents and children.

Conclusions

Most of the research articles analyzed in this study were taken from the databases WOS and SCOPUS. PsycINFO also proved relevant insofar as the number of articles retrieved, as was the case with other reviews of parental education programs (Pisani and Martins, 2016; Robles and Romero, 2011; Ruiz et al., 2018). Furthermore, the number of articles included is greater than those normally used in this kind of study. This owes to the fact that we have attempted to provide a general, global overview of published research involving the implementation and evaluation of parental education programs of the group variety. To accomplish this, we increased the number of recommended databases in order to reduce bias in the detection of research articles that were relevant to the object of our study.

We have also verified the increase in scientific production on the topic, which can in all likelihood be attributed to its relevance and timeliness as well as to an increased global interest in the design, implementation and evaluation of programs promoting positive parenting (European Council, 2006; American Society for the Positive Care of Children, 2019) within the framework of practices based on evidence (Páramo y Hederich, 2014). The fact that most of the articles published appeared in the last six years would seem to indicate the potential for this line of research as well as its foreseeable growth.

This systematic review has also served to discover and identify the journals publishing the greatest number of articles on the subject as well as the most prolific authors, valuable information for researchers working in the field of parental education programs. The same is true of the key words used in the different studies, which can help to better understand the characteristics of group interventions aimed at fostering positive parenting, such as the approach (principally educational), the theoretical models that they are based on (mostly of the cognitive-behavioral sort), or the aspects that the interventions are meant to have an effect on (infant-juvenile behavior, parental stress, parental skills or abuse prevention)

With regard to the origins of the research, we have identified the investigations carried out in the United States, Australia and the more developed countries in Europe and Asia, as had been noted by Barlow et al. (2012) and Ruíz et al (2018), but we also discovered others carried out in South America and Africa, thus addressing the need - identified by Mejía et al. (2012) - to find evidence of research about the effectiveness of parental education programs in less prosperous countries.

As regards the language of publication, in some of the systematic reviews (Altafim y Martins, 2016; Barlow et al, 2011; Valero et al., 2017), every single article included is in English. However, in this systematic review we have included articles on the subject written and published in Spanish, revealing a sizeable number of studies carried out both in Spain and, to a lesser extent, in Latin America.

Furthermore, we have discovered that not all group interventions are at the same stage of consolidation. Some studies focus on programs that are in their initial phase, while others are more consolidated or even in a quasi-experimental phase. In some cases the investigations are already in a stage of randomized, controlled tests. This is an aspect that

differentiates this systematic review from others that have been carried out. By including pre-experimental and quasi-experimental designs we were able to discover a broader range of programs and their evaluations; in disciplines such as education it is notoriously difficult to carry out purely experimental designs (Higgins y Green, 2011).

Finally, we were able to identify the programs promoting positive parenting that were most often implemented and evaluated internationally, which tended to coincide with those listed as models in reference guides. These results, while for the most part similar to those in other reviews of the literature (César and Rey, 2006; Licencín et al., 2017; Pérez and Yániz, 2015), in systematic reviews (Barlow et al., 2012; Lozano and Valero, 2017; Pisani and Martins, 2016) and in meta-analysis (Valero et al., 2017), provide a broader range of programs, including certain promising ones. This allows us to compare the different characteristics of the different interventions, providing us with guidelines for the design of future programs of parental education based on those that have proved most effective so far.

With regard to the limitations and potential afforded by this study, we believe that it would be worthwhile for other researchers to replicate the process of article selection and extraction of data used in this study, as a way of determining their reliability as reflected, for instance, in their degree of concurrence (Higgins y Green, 2011).

Another aspect of this study that should be kept in mind is that it deals only with scientific articles about the evaluation of parental education program, disregarding results from doctoral theses, seminars, published books, etc. This in itself could lead to bias, as can the descriptors used to limit the search; in resorting to only two languages in our search (English and Spanish), studies carried out in other countries/languages are left out.

We should also point out that our choice of 2006 as a starting point was due to it being the year when Recommendation 19 (European Council, 2006) was published. This is not to say that research had not been done previously on the implementation and evaluation of parental education programs, but rather that at this point such research received an important stimulus, accompanied by the popularization of the term positive parenting. The approach and mentality denoted by the term had of course existed for a long time already (Palacios, 2016).

While a more in-depth analysis of the studies encountered would surpass the limitations of this article's extension, we believe that this

review opens up new lines of investigation. Having drawn a general scheme of the scientific production, we feel that an assessment of the methodological quality of the articles is called for. After such an evaluation they could then be classified by types, or perhaps be subjected to a ranking of sorts, based on the results of the assessment of their methodological rigor (Rodríguez, 2017; Rodríguez and Úbeda, 2017). This would reduce the number of studies, leaving only those with the most solid evidence and validity.

In addition, data could be extracted relating to the general characteristics of the studies and of the programs implemented and evaluated that are analyzed in these studies (Jiménez and Hidalgo, 2009; Hidalgo, 2009; Rodrigo et al, 2015; Ruíz et al, 2018), allowing researchers to determine which aspects of positive parenting are dealt with in these programs (Rodrigo et al., 2015).

In summary, from an educational point of view the results of this systematic review provide researchers as well as professionals in the field of family education and orientation with a synthesis of the parental education programs backed up by the most reliable scientific evidence. It also offers a starting point for the further exploration of topics and contents addressed in the studies, of work methodologies, etc. In general, the type of interventions dealt with here offer parents a space for sharing their reflections on day-to-day experiences with their children. Parents are encouraged to rethink the way they bring up and educate their offspring and to develop and improve their own skills as educators. The idea is not for them to follow a single, idealized educational model but rather to offer them guidelines that they will then adapt to the idiosyncrasies of their own home in order to foster an optimal physical, psychological, social and academic development in their sons and daughters.

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