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Analysis of reading comprehension and disabilities among teenagers

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Título: Análisis de la comprensión lectora y sus dificultades en adolescentes.

Resumen: Estudios evolutivos que analicen el desarrollo de la comprensión lectora y sus dificultades en la adolescencia son relevantes, dada la importancia que ello tiene a estas edades en relación al rendimiento académico. El objetivo de este estudio es analizar el rendimiento y las dificultades en comprensión lectora y sus componentes en la adolescencia. La muestra está compuesta por 203 alumnos entre 12 y 14 años, pertenecientes a 1º, 2º, y 3º de Educación Secundaria Obligatoria de un centro seleccionado al azar de una zona sociocultural media de Málaga. Los alumnos son evaluados en comprensión lectora a través de la selección y organización de ideas textuales, conocimiento semántico y morfosintáctico, tras la lectura de un texto descriptivo, y en metacognición, con un cuestionario de consciencia lectora. El diseño es observacional trasversal, con una medida en cinco variables y tres grupos de estudiantes. Se realiza comparación entre medias y análisis de porcentajes de las dificultades. Los resultados muestran diferencias significativas entre los grupos en las variables de estudio, siendo las puntuaciones más altas en tercer curso. También se encuentra entre un 15-30% de dificultades de comprensión lectora en estas edades. Los porcentajes son mayores en selección y organización de ideas en todos los cursos, y en todas las variables los porcentajes son mayores en 3º curso. Estos resultados implican la necesidad de incidir en los procesos de enseñanza-aprendizaje de la comprensión lectora desde edades tempranas, con el fin de evitar las dificultades en la ESO.

Palabras claves: Comprensión lectora. Dificultades en comprensión lectora. Educación Secundaria Obligatoria. Adolescentes.

Abstract: Evolutionary studies that analyse the development of reading comprehension and related difficulties among teenagers are relevant, given importance of this skill for academic performance at this age. The aim of this study is to analyse performance and difficulties in reading comprehension and its components during adolescence. The sample is composed of 203 students aged 12 to 14, in the first, second, and third year of compulsory Secondary Education from a randomly selected school in an average socio-cultural area of Malaga. Students are evaluated for reading comprehension through the selection and organisation of textual ideas, as well as semantic and morpho-syntactic knowledge, after reading a descriptive text. Metacognition is assessed by means of a reading awareness questionnaire. The design is cross-sectional and observational, measuring five variables across three groups of students. A comparison of means and analysis of percentages of difficulties is carried out. The results show significant differences between the groups in the study variables, with the highest scores in the third year. Furthermore, between 15-30% of reading comprehension difficulties are found at these ages. The percentages are higher in the selection and organisation of ideas across all three school years examined, and the percentages are higher in the third year for all the variables. These results imply the need to control the teaching-learning processes of reading comprehension from an early age, in order to avoid difficulties in the first few years of secondary education.

Keywords: Reading comprehension. Reading comprehension difficulties. Compulsory secondary education. Adolescents.

Introduction

The study of reading comprehension is of great scientific interest because it is key to school learning processes and to the academic and personal development of students from the start of schooling (García et al., 2018; Ministry of Education, Culture and Sport, 2017).

Reading comprehension is a complex process of constructing meanings, which involves making inferences, interpreting information, and establishing logical connections between ideas until the person is able to create the macrostructure or mental state of the text (Baker & Beall, 2009; Britt et al., 2012; Kintsch, 2013; McNamara & Magliano, 2009; Pressley & Gaskins, 2006). It refers to the construction and verification of hypotheses, the creation and interpretation of proposals, and the application of previous knowledge, strategies, and expectations, in order to create the meaning of a text (Alvermann et al., 2013; Britt et al., 2012; Cano et al., 2014; Kintsch, 2013; Leon & Escudero, 2017; Santiesteban & Velazquez, 2012; Soriano et al., 2011). This process involves establishing the purpose of reading, the use of textual codes and prior knowledge about textual information, the use of control and monitoring strategies, and the self-regulation of understanding (Aragon & Caicedo, 2009; Botsas, 2017; Navarro & Mora, 2012; Pyle et al., 2017).

According to this conception of reading comprehension, difficulties are understood as deficiencies presented by individuals in constructing overall meaning and creating the macrostructure of the text (Kintsch, 2013). On the one hand, they present difficulties in using their previous knowledge to generate meaning, and when it comes to operating with textual information, not making use of macrorules and structural strategies, and using listing strategies (Baker & Beall, 2009; Kintsch, 2013; Pressley & Gaskins, 2006). In this sense, deficits will be present in the use of language strategies to access written meaning, as well as cognitive strategies to select and organise textual information (Leu et al., 2013; Britt et al., 2012). Therefore, the components of reading comprehension evaluated in this study include semantic and morpho-syntactic knowledge, as well as the selection and organisation of textual ideas. They also present difficulties in the reflection and evaluation of textual content, unable to make inferences between what is read and what is known, as well as in the supervision and self-regulation of the reading process (McNamara & Magliano, 2009; Langer, 2011). The study presented here considers the metacognition of reading comprehension as one of its components. In short, students with difficulties in this field present a reading that adheres closely to the text. They do not learn by reading

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and lack the linguistic, cognitive, and metacognitive strategies necessary to access the content of a text (Navarro & Mora, 2012).

It should be noted, on the one hand, that the development and learning of these processes and the strategies involved require a degree of automation and sequencing (Álvarez et al., 2020; Kintsch, 2013; MECD, 2014:2015). Mastery of this process is acquired during the two key stages of Primary Education and in the first key stage of Secondary Education, given the curricular objectives developed at all these stages (MECD, 2014, 2015). Thus, the ability to understand a text develops as the child advances through the different educational levels, progressively mastering the different underlying skills throughout compulsory education, so differences according to age would be expected (García et al., 2013; Guzmán et al., 2019; MECD, 2015). In this regard, it should be noted that, in our educational context, evolutionary studies analysing the acquisition and development of reading comprehension in adolescence are scarce, which is one of the reasons for this study.

On the other hand, reading comprehension performance is periodically analysed by the International Study on Progress in Reading Comprehension (PIRLS) among pupils in the fourth year of primary education (9 years of age) and by the OECD Programme for International Student Assessment (PISA) among students in the fourth year of Secondary Education (15 years) in different countries around the world. In general, these studies indicate a significant percentage of students with very low performance in this field in our country (Ministry of Education, 2010; OECD, 2007, 2019). In particular, the PISA report points out that Spain's results are below the European average in terms of reading competence (OECD, 2007, 2019), and the situation is compounded not so much by the number of students with low results but by the lack of students with good reading skills (Ministry of Education, 2010). Other international studies such as PIRLS indicate that the situation has been evolving in Spain in recent years, with levels of reading comprehension improving (MECD, 2017), presenting the second highest increase in 2011-2016 (MECD, 2017), although scores in Spain remain below the European average, with up to 20% of students presenting low and very low scores (MECD, 2017). These studies compare the level of understanding of texts at specific ages between countries in different time periods, but do not analyse the difficulties students present in reading comprehension and in its components at different ages, which is another reason for conducting this study. In this respect, some studies conducted in Spain indicate poor academic performance among students in compulsory secondary education, which is associated, among other reasons, with serious problems in literacy learning (Botsas, 2017; García, et al., 2018; González et al., 2018; Solis et al, 2012). Most students do not possess the mechanisms they need to undertake the proposed homework assignments, because they do not understand what they read, have bad reading habits, rarely read at home, and the family does not encourage reading for pleasure either (Carpio et al., 2012). In addition, the scant attention given to teaching this process in school and to the fact that, in general, these skills are learned in a non-systematic and intuitive way, lead to problems in written language becoming more pronounced in adolescence (Duke et al., 2021; Fonseca et al., 2019; Ministry of Education, 2010).

Therefore, this paper aims to analyse, firstly, the evolution of performance in reading comprehension (RC) and its components (selection and organisation of ideas, semantic knowledge, morpho-syntactic knowledge, and metacognition of reading comprehension) in adolescence, to check for significant differences between different ages and school years. Secondly, it sets out to analyse the difficulties observed in reading comprehension and its components and to explore which groups and variables present the greatest difficulties, in order to know which skills are most or least affected.

Method

Design

This empirical research applies a non-experimental associative strategy.

It follows an observational, descriptive, comparative, cross-sectional cohort design (Ato et al., 2013), conducting a single evaluation of reading comprehension and its components (selection and organisation of ideas, semantic knowledge, morpho-syntactic knowledge, and metacognition) in three groups of students of different ages (12, 13 and 14 years old). In the study, we controlled for the most relevant extraneous variables, such as the presence of cognitive deficits or sociocultural influence.

Participants

The study population were students in the first, second, and third years of compulsory secondary education in Malaga, attending state-owned and grant-maintained schools in average socio-cultural areas of the city.

Stratified sampling was applied to select the participating schools, according to socio-cultural level. Schools were classified by socio-cultural areas (high, average, low). According to the census of schools published by Andalusia's Regional Department for Education, from the total of six state-owned secondary schools located in average socio-cultural areas within the province, one school was randomly chosen to take part in the research. In this area, 30 per cent of the population presents a below-average level of literacy (INE, 2011). At this school, students are divided into two groups per academic year. The allocation of participants to the groups was not randomised but rather was defined by the school year and age of the students.

The sample was composed of 203 compulsory secondary education students aged 12 to 14, Spanish-speaking, from an intermediate socio-cultural background. These ages were

chosen because they are the most representative and closest to the ages of Primary Education, which is when the teaching of reading comprehension is more explicitly included in the curriculum. Students who had repeated years or were in the process of doing so and those who had physical, mental, or sensory handicaps were excluded from the sample.

The sample is divided into three groups. The first group consists of students in the first year of secondary education (n = 59), of which twenty-seven were girls and thirty-two were boys aged 12 (M = 12.35 and SD = 0.67). The second group consists of students in the second year of secondary education (n = 67), with thirty-seven girls and thirty boys aged 13 (M = 13.47 and SD = 0.75). The third group consists of students in the third year of secondary education (n = 77), with forty-one girls and thirty-six boys aged 14 (M = 14.53 and SD = 0.84).

Instruments

The evaluation of reading comprehension took into account the scores obtained in the selection and organisation of textual ideas (extraction of the main idea from a piece of writing and organisation of the main and secondary ideas), semantic knowledge (vocabulary and knowledge about the meaning of key words in the text), morpho-syntactic knowledge (adequacy and use of different morpho-syntactic rules), and metacognition of reading comprehension (self-knowledge and self-regulation about the process of understanding) (Langer, 2011; Leu et al., 2013; McNamara & Magliano, 2009; Britt et al., 2012). Different types of measurements have been used according to each variable. The selection and organisation of textual ideas, semantic and morpho-syntactic knowledge were evaluated following analysis of the reading of a descriptive text whose main idea was the economic dominance of the US (Martinez, 1995), where participants had to read and respond to certain questions about it as detailed below. Reading Comprehension Metacognition was evaluated by means of the Reading Awareness Questionnaire (Paris & Jacobson, 1984), as modified by González (1993). The total score is the sum of the scores achieved in each of the measures mentioned, with the highest attainable score being seventy-nine points. The reliability of the assessments was measured based on the number of agreements and disagreements between the assessments made by the examiners (96.01 %). Internal consistency was adequate (α = .87).

The selection and organisation of ideas was evaluated by asking the students about the main idea contained in the text and getting them to write a summary organising the textual information. For the selection of the main idea, two points were awarded when the main idea indicated was the correct one, one point when they were close to the right one, and zero points when they were nowhere near or did not answer. For the organisation of ideas, two points were awarded when the structure and ranking of the main and secondary ideas was correct, one point when they were close, and zero when they were incorrect. The total score is the sum of the partial scores obtained, the maximum attainable score being four points (González & Martín, 2019). The responses of each student were evaluated by two examiners. The reliability of the assessments was measured based on the number of agreements and disagreements between the assessments made by the examiners (94.51 %) and through the analysis of internal consistency, using Cronbach's Alpha coefficient (α = .85).

Semantic knowledge was evaluated by asking students to define three important words from the text selected by the authors. Two points were awarded when the definition was correct, one if the definition was partially correct, and zero when the definition was incorrect. The total score is the sum of the partial scores obtained, with the maximum attainable score being six points (González & Martín, 2019). The responses of each student were evaluated by two examiners. The reliability of the assessments was measured based on the number of agreements and disagreements between the assessments made by the examiners (91.35 %). Internal consistency was adequate (α = .82).

Morpho-syntactic knowledge was evaluated by first asking students to select from the text three nouns, three adjectives, and three verbs and to indicate their characteristics. Three points were awarded for each item that was successfully selected and analysed; two points, if correctly indicated but they only correctly analysed half of its properties; one point, if the item was correctly selected, but the analysis was inadequate; and, zero points, if they did not choose the appropriate item. Secondly, they were asked to perform a syntactic analysis of two sentences and to indicate the type of sentence. Three points were awarded when they identified the type of sentence and the analysis was correct; two points when they only performed the analysis correctly; one point when they only distinguished the fundamental parts of the sentences; and zero points when the analysis was incorrect (González & Martín, 2019). The total score is the sum of the scores obtained on both tests, the maximum attainable score being thirty-three points (González & Martín, 2019). The responses of each student were also evaluated by two examiners. The reliability of the assessments was measured based on the number of agreements and disagreements between the assessments made by the examiners (93.71 %). Internal consistency was adequate (α = .85).

The meta-cognition of reading comprehension was evaluated by means of the Reading Awareness Questionnaire (González, 1993), composed of 18 items offering three alternatives, grouped into four scales: the evaluation of information (mechanisms for the control of reading comprehension based on reading, how to suspend judgement, rereading, etc.); planning of the reading comprehension process (based on the planning of reading based on the text, with processes such as what is most important, which part is the main idea, how to find the main idea, etc.); the regulation of reading comprehension (processes that indicate when to suspend the judgement, which parts of the reading are important and

which are not, etc.); and conditional knowledge (asking about different situations in which to choose a different mode of reading, based on the objectives of such a situation). The answer to each item received two points if they chose the correct option, one point if it was partially correct, and zero points when it was the wrong option. The total score is the sum of the partial scores obtained, the maximum attainable score being thirty-six points. The internal consistency of this questionnaire is .84.

Procedure

The tests described above were administered collectively in the students' respective ordinary classrooms and during school hours, supervised by two graduates in Psychology.

Firstly, permission was requested from the ethics committee of the Universidad de Málaga (CEUMA). Once the management team from the school had signed the informed consent documentation, the students performed the tasks set for selecting and organising ideas, and semantic and morpho-syntactic knowledge over forty-five minutes, after reading the text. Subsequently, they completed the reading comprehension meta-cognition questionnaire, which took fifteen minutes.

Statistical analysis

To analyse performance in reading comprehension and its components, descriptive statistics were calculated for the different variables, and comparisons between the groups were made through the analysis of variance and the Scheffé method, when the criterion of homogeneity between the variances is fulfilled, calculated by means of Levene's test. In the event that the assumption of homoscedasticity was not fulfilled, group comparison analysis was carried out by means of the Kruskal-Wallis and Mann-Whitney U tests.

To analyse learning difficulties in reading comprehension, the criteria used in similar studies have been followed (APA, 2013; González & Martín, 2006; Kavale and Forness, 2000), calculating, firstly, the number of students scoring in each variable below the average of their peer group minus a standard deviation and, secondly, the proportion they represent with respect to the number of students in each group.

Results

Analysis of performance in reading comprehension and its components

The descriptive statistics calculated (mean and standard deviation) for the variable reading comprehension and its components in the three groups are given in Table 1.

For reading comprehension, the maximum value is recorded in the third year of secondary education (M = 72.30 and SD = 13.70), followed by the first year of secondary education (M = 57.98 and SD = 18.20) and, finally, the second year of secondary education (M = 51.86 and SD = 11.96). The Levene test did not verify the assumption of homogeneity of the variances (L (2, 182) = 8.924 and p = .000), therefore analysis of variance was not performed. Following the Kruskal-Wallis test (Table 2), significant differences were found between the groups (χ^2 = 49.74 and p = .000). According to the Mann-Whitney U test, there are differences between the first- and second-year students (U = 1416 and p = .007), between first- and third-year students (U = 946.5 and p = .000) and between second- and third-year students (U = 621.5 and p = .000).

Table 1
Descriptive statistics of reading comprehension and its components, by school year.

	1st YEAR		2nd YEAR		3rd YEAR	
	M	*SD*	*M*	*SD*	*M*	*SD*
Reading comprehension	57.98	18.20	51.86	11.96	72.30	13.70
Selection and organisation of ideas	1.52	1.31	1.54	1.19	2.26	1.02
Semantic knowledge	2.97	1.67	1.45	1.13	4.03	1.50
Morpho-syntactic knowledge	14.00	9.90	8.58	5.56	20.50	8.84
Meta-cognition of Reading Comprehension	25.08	4.53	25.46	4.12	27.20	3.46

As for the selection and organisation of ideas, the maximum value is recorded in the third year of secondary education (M = 2.26 and SD = 1.02), followed by the second year of secondary education (M = 1.54 and SD = 1.19) and, finally, the first year of secondary education (M = 1.52 and SD = 1.31). The assumption of homogeneity of the variances is not fulfilled (L (2, 198) = 4.258 and p = .015). According to the Kruskal-Wallis test (Table 2), there are statistically significant differences between the different years (χ^2 = 16.83 and p = .000). According to the Mann-Whitney U test, there are differences between first- and third-year students (U = 1495 and p < .001), between second- and third-year students (U = 1658.5 and p = .001) and between first- and second-year students (U = 1906.5 and p = .835).

Table 2
Differences between groups in reading comprehension, selection and organisation of ideas, semantic and morpho-syntactic knowledge.

	Average Range			DF	χ^2	*p*
	1st	2nd	3rd			
Reading comprehension	84.14	64.37	128.74	2	49.741	.000
Selection and organisation of ideas	87.65	88.78	122.01	2	16.832	.001
Semantic knowledge	104.30	54.76	136.08	2	73.242	.000
Morpho-syntactic knowledge	91.68	62.78	127.96	2	48.830	.000

For the variable semantic knowledge, the maximum value is recorded in the third year of secondary education (*M* = 4.03 and *SD* = 1.5), followed by the first year of secondary education (*M* = 2.97 and *SD* = 1.67) and, finally, the second year of secondary education *(M* = 1.45 and *SD* = 1.13). Similarly, the assumption of homogeneity of variances is not fulfilled (*L* (2, 195) = 5.305 and *p* = .006), but the Kruskal-Wallis test (Table 2) shows there are significant differences between the groups (χ^2 = 73.24 and *p* = .000). The differences are between first- and third-year students (*U* = 1421.5 and *p* = .001), between second- and third-year students (*U* = 471 and *p* = .000), and between first- and second-year students *(U* = 932 and *p* = .000), according to the Mann-Whitney U test.

For the variable morpho-syntactic knowledge, the highest scores are recorded in the third year of secondary education (*M* = 20.05 and *SD* = 8.84), followed by the first year of secondary education (*M* = 14 and *SD* = 9.90) and finally the second year of secondary education *(M* = 8.58 and *SD* = 5.56). Similarly, the assumption of homogeneity of variances is not fulfilled (*L* (2, 185) = 17.449 and *p* = .000), but the Kruskal-Wallis test (Table 2) shows there are significant differences between the groups (χ^2 = 48.83 and *p* = .000). According to the Mann-Whitney U test, there are differences between first- and third-year students (*U* = 1135 and *p* = .000), between second- and third-year students (*U* = 670 and *p* = .000) and between first- and second-year students *(U* = 1258 and *p* = .006).

The mega-cognition of reading comprehension (Table 1) presents similar results to the rest, since the maximum value is recorded in the third year of secondary education (*M* = 27.20 and *SD* = 3.46), followed by the second year of secondary education (*M* = 25.46 and *SD* = 4.12) and, finally, the first year of secondary education *(M* = 25.08 and *SD* = 4.53). After verifying the assumption of homogeneity of variances (*L* (2, 199) = 0.959 and *p* = .385), and by means of the analysis of variances, significant differences between the groups are found, with *F*(2,201) = 5.51 and *p* = .005 (Table 3). These differences are between first- and third-year students (*F* = 2.11 and *p* = .011) and between second- and third-year students (*F* = 1.73 and *p* = .038), according to Scheffe's test.

Table 3
Differences between groups in meta-cognition of reading comprehension.

		Sum of squares	df	Root mean square	*F*	*p*
Meta-cognition of Reading Comprehension	Inter-group	177.723	2	88.861	5.510	.005
	Intra-group	3209.272	199	16.127		
	Total	3386.995	201			

Analysis of difficulties in learning reading comprehension and its components

Table 4 presents the cut-off points calculated in each of the sample groups and in each variable to select students with difficulties, as well as the number and percentages of students in the study sample who have difficulties in reading comprehension and its components.

For the variable reading comprehension, eight first-year students are considered to have difficulties, representing 15.09% of the total number of students in this year (Table 4). A total of eleven second-year student present difficulties, representing 16.66 % of the total number of students in this year. Finally, a total of fourteen third-year students present difficulties, representing 21.21% of the total students in this year.

Table 4
Cut-off point, number of students and percentages of difficulties in all variables according to school year.

	1st YEAR			2nd YEAR			3rd YEAR		
	M-SD	ND	%	*M-SD*	ND	%	*M– SD*	ND	%
Reading comprehension	0.21	8	15.09	0.35	11	16.66	1.24	14	21.21
Selection and organisation of ideas	1.29	18	30.50	0.32	16	24.24	2.53	18	23.68
Semantic knowledge	4.11	12	20.33	3.02	13	19.69	11.66	13	17.80
Morpho-syntactic knowledge	20.55	9	16.98	21.34	12	17.91	23.74	15	22.05
Meta-cognition of Reading Comprehension	39.77	7	11.86	39.87	10	14.92	59.60	8	11.76

Note: ND= number of students with difficulties in reading comprehension

For the variable selection and organisation of ideas, eighteen first-year students present difficulties, representing 30.50%; sixteen second-year students present difficulties, representing 24.24% of the total sample for this year; and a total of eighteen third-year students present difficulties, representing 23.68% of students in this year (Table 4).

As for semantic knowledge, twelve first-year students present difficulties, representing a total of 20.33% of the students in this year. Thirteen second-year students are considered to have difficulties, representing a total of 19.69% of the students in this year. Thirteen third-year students present difficulties, representing a total of 17.80% of the students in this group.

With regard to morpho-syntactic knowledge, a total of nine first-year students present difficulties, representing 16.98 % of the total students in this year. Twelve second-year students are considered to have difficulties, representing 17.91% of the total students in this year. Finally, a total of fifteen third-year students present difficulties, representing 22.05 % of the total students in this year (Table 4).

In reading comprehension meta-cognition, seven first-year students present difficulties, representing 11.86% of the sample in this year. Ten second-year students present difficulties, representing 14.92 % of the total students in this year. Eight third-year students are considered to have difficulties, representing 11.76 % of the total number of students in this year (Table 4).

Discussion and conclusions

The first objective of this study is to analyse the evolution of performance in reading comprehension and its components in adolescence, in order to ascertain whether there are significant differences between the different ages and school years.

According to the results obtained, there are differences in reading comprehension between all the groups, with third-year students obtaining the best scores, followed by first- and second-year students. Specifically, we found that, for the variables selection and organisation of ideas and meta-cognition of reading comprehension, there are no significant differences between first- and second-year students in compulsory secondary education, but there are significant differences between first- and second-year students in relation to third-year students. In other words, cognitive and meta-cognitive strategies of reading comprehension do not undergo substantial changes in short periods of time, but they do over a longer period of time. On the other hand, with regard to semantic and morpho-syntactic knowledge, significant differences are found between all groups, the highest scores being recorded among third-year students, followed by first- and second-year students. In other words, linguistic knowledge undergoes changes in shorter periods of time. It appears, therefore, that there is a different evolutionary pattern for cognitive and meta-cognitive variables than for linguistic knowledge, involved in reading comprehension, where changes in high-level processes (selection and organisation of ideas and metacognition) are slower than changes in low-level processes (semantic and morpho-syntactic knowledge), as expected (Herrada-Valverde & Herreda, 2017; Kintsch, 2013; Welie et al. 2018). The automation of low-level processes is an indispensable requirement for cognitive and meta-cognitive resources to be available in high-level processing, given the limited capacity of operational memory (Álvarez et al., 2020; Iglesias et al., 2015; Perfetti et al., 2005). Longitudinal studies are required to provide more information about changes in the high- and low-level processes involved in reading comprehension at these ages. This could be the subject of future research.

The second of the objectives of this paper was to analyse difficulties in reading comprehension and its components in compulsory secondary education, in order to know which age brackets or groups present greater problems.

The results indicate, firstly, that there is a considerable increase with age in the percentages of difficulties in reading comprehension, ranging from 15% to 21%, finding most difficulties among third-year students (Garcia et al, 2013). These results are consistent with the latest national and international studies evaluating reading proficiency and academic performance (Ministry of Education, 2010; MECD, 2017; OECD, 2007) and with findings indicating that difficulties in reading comprehension increase by almost four percentage points in the transition from Primary to Secondary Education (Fonseca et al., 2019; García et al., 2013). It should be noted, however, that although the greatest number of difficulties were observed among third-year students, this group also achieved the highest scores compared to the others. This might indicate that differences between students who are adequately acquiring basic skills in reading comprehension and those who are not may be due to the lack of an adequate plan for the early detection of these difficulties, which, because they are not detected in time, could increase with age. These results demonstrate the need for adequate early detection of reading comprehension problems and direct classroom instruction, as well as specific psycho-educational research in teaching programmes (Berkeley et al., 2010; Botsas, 2017; Duke et al., 2021; Robledo et al., 2019; Solís et al., 2012).

Secondly, as regards the components of reading comprehension, the variable that presents the highest percentages of students with difficulties in most age brackets is the selection and organisation of ideas (23-30%), followed by morpho-syntactic (17-22%) and semantic (17-20%) knowledge, and finally meta-cognition (12-15%). In the selection and organisation of ideas and in semantic knowledge, the percentage of difficulties is higher among first-year students. However, in morpho-syntactic knowledge, it is slightly higher among third-year students, and slightly higher among second-year students for meta-cognition. That is, students with reading comprehension difficulties present more problems in relation to cognitive strategies and linguistic knowledge than in meta-cognitive strategies, and these difficulties differ according to school year. This may be because, although they are

taught the cognitive and linguistic strategies necessary for reading comprehension, students do not use them. In this regard, it would appear that, even in Secondary Education, students should be trained in the use of linguistic knowledge and cognitive strategies, while continuing to focus on the usual curricular contents (Lee & Tsai, 2017; Navarro & Mora, 2012). It is striking that the percentages of difficulties are lower in terms of meta-cognition, which indicates that students know the strategies and yet do not use them properly. This is one of the frequent features shown by students with learning disabilities (Botsas, 2017; Navarro & Mora, 2012). It would appear to be necessary, therefore, for ordinary instruction to emphasise not only knowledge of strategies, but also their use.

We must note that the findings of this study should be approached with caution due to the sample size. Studies with larger samples and a longitudinal design would give more robustness to the results found. Likewise, it would have been interesting to know the type of instruction that the students evaluated had received in reading comprehension in previous years, in order to better understand the factors that explain the results obtained and to be able to offer adequate educational guidelines to improve them.

Finally, in view of the results found in this study, a few relevant educational implications derived from this study should be noted. On the one hand, the need to teach linguistic knowledge and cognitive and meta-cognitive strategies, which are necessary for reading comprehension, explicitly and systematically in the ordinary classroom (Cruz & Aguado, 2014; Pyle et al., 2017). In this way, progressive improvement could be achieved in new students and those who present difficulties in the skills involved in understanding a text. It is common to find information about how students should understand texts in order to learn academic content, but it seems more effective to emphasise explicit teaching of the appropriate knowledge and procedures on how to do this (Duke et al., 2021; Beltrán & Repetto, 2014; Pyle et al., 2017; Zhang, 2018). We should also highlight the importance of detecting the difficulties shown in reading comprehension and in all its components at an early age, in order to improve or remedy them as soon as possible and to ensure that they do not increase through the different educational stages. In short, the results found highlight the need to emphasise through the school curriculum the teaching-learning of reading comprehension in compulsory Secondary Education, as well as the importance of the psycho-educational detection of difficulties at an early age.

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