disabilities

MDPI

Article

Literacy difficulties ´self- perception in advertising students

Marta Martín-Llaguno [1]*, María J. Ortiz-Diazguerra[2] and María J. Vilaplana-Aparicio[3]

[1] Department of Communication and Social Psychology, University of Alicante; marta.martin@ua.es
[2] Department of Communication and Social Psychology, University of Alicante; mj.ortiz@ua.es
[3] Department of Communication and Social Psychology, University of Alicante; maria.vilaplana@ua.es

* Correspondence: marta.martin@ua.es

Abstract:

In the last years, university professors have detected an increase in misspellings, even in degrees where proficiency in communication is essential. There is a need to analyse how writing and reading problems prevalence has enlarged, but also the reason why this has happened. This research starts from the assumption that in some countries students with literacy difficulties might be reaching the university without a proper diagnosis or support intervention. In the frame of Advertising studies, a creative career with requirements of high knowledge of oral and written communication, the study compares in Spain actual literacy problems diagnoses to literacy self-perception. It also explores the awareness and attitudes toward dyslexia through an online questionnaire. Results show, on one hand, a quantitative discrepancy between actual diagnosis and self-perception struggles. On the other hand, a qualitative discrepancy with those pupils with dyslexia diagnoses reporting lower punctuations in the literacy struggles than the rest. Finally, a practical discrepancy, as there is widespread theoretical knowledge about dyslexia that does not correspond to practical interventions for this problem. Causes and consequences of these discrepancies in communication students require further research.

Keywords: dyslexia, learning disability, university, higher education, neurodiversity.

Citation: Lastname, F.; Lastname, F.; Lastname, F. Title. *Eur. J. Investig. Health Psychol. Educ.* **2022**, *12*, Firstpage–Lastpage. https://doi.org/10.3390/xxxxx

Academic Editor: Firstname Lastname

Received: date
Accepted: date
Published: date

1. Introduction

Although misspelling is usually conceived as typical errors of basic educational levels, it is becoming increasingly present among university students [1]. The feeling of helplessness and doubt about how to deal with these orthographical difficulties is share by lecturers in other countries [2]. Paredes [3] claims that the roots of this problem are diverse: the lack of social esteem for humanistic disciplines, the monotonous teaching of spelling, and the little knowledge about the psychological mechanisms involved in the assimilation of orthographic contents. To these reasons, Penas Ibañez [4] adds the influence of modern technologies, the lack of interest in reading, and a greater tolerance with these kinds of mistakes. On the other hand, poor orthographic spelling performance usually characterizes dyslexia [5]. This learning difficulty, especially the mild cases, might go unnoticed until entering the university when the reading and writing demands increase [6].

This research starts from the assumption that some students with literacy difficulties (specifically, dyslexia) reach, in Spain, the university system without diagnosis or support interventions. The presumption is that, when reading and writing demands increase significantly in college, deficits that had remained latent may emerge and have conse-

quences. Within this frame, and as a case study in University of Alicante, we want to detect possible literacy problems in university students of Advertising and Public Relations through a self-perception questionnaire. Additionally, we explore the knowledge and attitude that university students have about dyslexia.

We structure this paper as follows. Within the "Introduction" we explain characteristics of dyslexia, prevalence numbers, and diagnosis problems, to enlighten the usefulness of self-diagnosis. Then we present a little contextualization of the requirements of an Advertising Degree, in relation to reading and writing abilities, to finish the goals and hypothesis of the study. The "Materials and Methods" section introduces the methodology for our research, with an explanation of the instrument (ATLAS questionnaire) and the population where we measured literacy problems perception and attitudes toward dyslexia. Empirical findings in our "Results" section are considered in the "Discussion" part.

1.1. Dislexya definition, prevalence an intervention

Problems in learning to read and write are one of the greatest challenges in education. Reading and writing, which constitute one of the objectives of the first stages of education, develop together until the student reaches the level of comprehension that allows him/her to interpret, evaluate and use written materials. Fundamental to this process is the functioning of the human brain, which consists of two hemispheres that communicate with each other. The left hemisphere is specialized in linguistic processes, while the right hemisphere manages the visual and spatial dimension. The left hemisphere processes information sequentially, while the right hemisphere processes information simultaneously. When we read, both hemispheres are combined.

The World Health Organization [7] defines dyslexia as a specific disorder of reading and writing that can be developmental, when a child does not manage to conduct these processes, or acquired, when a person managed to perform them perfectly but due to a disorder that appears later lost those faculties. Different studies suggest a shared neurocognitive basis for developmental dyslexia that does not affect overall intelligence [8]. The main cognitive outcome of this brain characteristic are trouble in processing the sounds of words that leads to wrong phonological representations and spelling deficits [9]. The performance manifestations are all related to reading and writing tasks: inaccurate word recognition, low lexical quality of the writings, comprehension problems, reduced reading experience, etc. The dyslexic individuals commit more misspelling errors even though they have received treatment and they are educated adults [10]. Although the type of mistakes can vary across languages depending on the correspondence between graphemes and phonemes [11], studies show striking similarities. For example, Rello et al. [12] compile the errors extracted from a collection of texts written by Spaniards with dyslexia and compare the list with studies conducted in English. They observe that the distribution of the typology of mistakes was similar, both in type (substitution, omission, addition, and transposition of letters) and in the frequency.

People with dyslexia can present a wide display of deficits that range from mild to severe and they can change with age [13], making diagnosis and determination of the incidence problematic.

According to Shaywitz et al. [14] and Artigas-Pallarés [15], a discrepancy between reading level and intelligence ability, chronological age and educational or pedagogical attention is necessary for identification.

Different studies [16] [17] have shown that one of the indicators of dyslexia is the difficulty in recognizing words and consciously perceiving spelling mistakes they write. Although for people with dyslexia spelling errors do not influence their reading comprehension [10], spelling errors do have a negative effect on the academic curriculum as grades may be lower, especially in majors such as communication, where proficiency in spelling and written grammar is critical.

On the other hand, people with dyslexia are more prone to develop anxiety towards reading [18], the unpleasant emotional reaction to the anticipation or act of reading that generates significant repercussions in the performance of students who suffer from it [19].

A systematic review of articles concludes that students with dyslexia show higher levels of anxiety than those who do not have this difficulty [18]. Part of the explanation may lie in the fact that lack of knowledge is a barrier that dyslexic people deal with in their lives. The lack of empathy and awareness, especially in the classroom, leads to feelings of frustration, anxiety, or discrimination [20]. But, on the other hand, these students may have been subjected to excessive pressure without receiving adequate emotional support or training for their case. In this sense, dyslexic women present higher levels of anxiety than men and with different ways of coping, since they tend to internalize their feelings while men express them more aggressively [21].

Studies that have analyzed the prevalence of dyslexia in different contexts have obtained disparate results, ranging from 5-7% [22], 13% [23] or 20% in an extensive concept of reading difficulties [24]. What seems clear is that dyslexia affects approximately 80% of subjects with specific learning difficulties [24]. In relation to the educational stage, the prevalence has been estimated at 5-15% of school-age children, depending on the language and culture [25].

In Spain, prevalence ranges between 3% and 6% in primary and secondary education [25][26].

In higher education, the true incidence of dyslexia is difficult to calculate because of the different educational systems and practices. According to Stampoltzis and Polychronopoulou [27], studies indicate that it ranges between 2% and 10%. Mortimer and Crozier [28] estate that percentages are inaccurate as they do not include students with dyslexia but without diagnosis or those who don´t want to identify themselves.

Wolff and Lundberg research [29] indicates that dyslexia signs are more frequent among art students. The authors interpret this finding not as an attempt to escape the literacy demands but as a relationship between artistic talent and dyslexia, suggested also by Chakravarty [30] or Bacon and Bennet [31].

In Spain, López-Escribano et al. [32] designed a screening protocol for the detection of dyslexia among university students and they tested it in different social sciences degrees. Results showed that between 1.6% and 6.4% of students could be at risk of suffering dyslexia, being this risk higher in degrees with low entry requirements. The cut-off to enter a degree in Spain is established in accordance with the offer and demand in each area. Since spelling errors lead to lower scores, people with dyslexia are unfairly disadvantaged in choosing a career.

Specific learning difficulties have important consequences on students' academic life, leading to situations of school failure and early school dropout [33]. Many students with learning difficulties require intervention to complete educational stages and their school failure and dropout rate between 40% and 56%, compared to 25% of the without difficulties [26].

Instead of analyzing and strengthening systems for early detection, school guidance or personalized intervention, countries may respond to the demands of international organizations to reduce its early school dropout with a reduction in the requirements of the school system [34]. In this context, a situation of under-diagnosis and under-intervention in children with learning difficulties, which has not been calculated, may exist. Due to this, in Spain, not all students with writing or reading difficulties may have been identified before they reach higher education. However, it is possible that in college, when reading and writing demands increase significantly, deficits that had remained latent may emerge and have consequences.

In any case, a student who enters the Spanish university can request curricular adaptations. The Curricular Adaptations are modifications or adjustments that facilitate access, permanence, and course achievement that, although not important, allow stu-

dents with disabilities to acquire all the professional competencies and academic content they will need to work as professionals. Students diagnosed with dyslexia can apply for a curricular adaptation that usually includes additional time for written tests. However, not all the students request or even know this option

1.2. Self-perception of literacy difficulties: the ATLAS test

The detection of reading and writing disorders is not a straightforward process, neither for the students themselves, nor for the families or, especially, for the teachers. As mentioned above, the general lack of knowledge is compounded by the great heterogeneity in the manifestations of these disorders, so that, on many occasions, some of them are attributed to other reasons.

Research has used self-reports to gather information on the personal history of learning to read or the current reading and spelling abilities of adults. The advantage of self-reports is that they collect multiple and reliable information in a brief time, even without personal contact with the individual being evaluated. The latter quality is of excellent value due to the unwillingness of adults to participate in assessment tasks [35] [36].

The ATLAS (Autoinforme de Trastornos Lectores para Adultos) questionnaire is a self-report of adult reading skills in Spanish and has shown to be a valid and reliable instrument in adults. In their study, Giménez et al. (2015) corroborated the idea that adults have an accurate perception of their abilities and are competent to make realistic descriptions [37]. Furthermore, they concluded that participants' reports did not differ from data obtained through specific tests. Although the agreement did not reach the 80% reported by other studies, the most representative characteristics of struggling readers, i.e., word and pseudoword encoding, were highly predicted by the questionnaire items. Likewise, the items discriminated between good and poor readers.

1.3. The Degree in Advertising and Public Relations. Reading and writing skills

The main objective of the Degree in Advertising and Public Relations is to train students in the study, analysis and creation of the communicative phenomena that occur in society and particularly in the areas of persuasive communication.

It is possible to access the studies of Advertising and Public Relations from any of the current modalities of secondary school; however, considering the type of subjects that the career has, the most frequent modality from which students' access is the Humanities and Social Sciences. As established in the teaching guide of the UA degree, one of the basic objectives of this training is that "graduates are able to communicate and express themselves coherently and correctly in their professional practice; for this they must master the specialized use of the language/s of their community and English". These objectives can be achieved with the acquisition of a series of knowledge and skills that must include, among others, training "in the expressive capacities and particularities of each of the advertising media, supports and formats for the elaboration of messages and communication campaigns", and within the general competencies of the studies, the mastery of "oral and written communication in the native language" is specifically specified.

The proficiency in reading and writing skills is, therefore, a sine qua non of these studies. It is important for advertising and public relations students to deepen their knowledge of languages and develop their written and oral communication skills. In fact, the skills most valued by employers in this field are problem solving and communication skills [38].

It is, therefore, foreseeable that students who access these studies will have literacy proficiency like or higher than the average university student.

1.4. Objectives and assumptions

The general purpose of the present paper is to add more evidence to the growing literature about the dyslexia in the university, assessing, within a case study, the percentages of students either diagnosed or undiagnosed but with compatible struggles that follow an Advertising Degree. This grade trains in the study, analysis and creation of the communicative phenomena that occur particularly in the areas of persuasive communication. The proficiency in oral and written communication, as we have seen, is a goal specifically stated. However, creativity and artistic, are also demanded skills, related to dyslexic people [39].

Based on the literature reviews and the factual experience, the basic assumptions from which we start are the following:

a. There is a quantitative discrepancy with *differences between diagnosis and (self-perception) struggles.*
b. As an Art degree, in advertising *there is a higher percentage of students with writing and reading problems* that with official diagnose.
c. In any case, *those pupils with dyslexia diagnose will report higher punctuations in the literacy struggles than the rest*.
d. There is a quite widespread theoretical knowledge about dyslexia that does not correspond to attitudes and to practical interventions on this problem.

In this context, we specifically we intend to:

- Obj. 1: Explore the history of learning difficulties of Advertising students,
- Obj. 2: Identify the percentage of diagnosed dyslexic students to detect if the prevalence is higher, lower, or similar to that one identified in other studies,
- Obj. 3: Identify the percentage of non-diagnosed dyslexic that report signs related to dyslexia,
- Obj. 4: Describe the student's knowledge and attitudes toward dyslexia and curricular adaptations.
-

2. Materials and Methods

2.1. Participants

To answer to our research questions, our study was conducted with students of the Degree in Advertising and Public Relations at the University of Alicante (Spain). The cut-off marks for the last four years were around eight out of 14. In the 2021-2022 academic year there were a total of 1046 students in the degree and 284 participated in the study (27.2%). The male-female proportion (81.7–18.3%) was almost like their presence in the degree (72.8%-27.2%). Regarding the distribution among years, 29.6% were in first-year, 21.1% in second-year, 25.0% in third-year, 22.2% in fourth (and last) year and 2.1% in various years at the same time. The mean age was 21.0 years (SD = 4.7).

2.2. Instrument

The Autoinforme de Trastornos Lectores para Adultos (ATLAS) [Self-Report of Reading Disorders for Adults] was used as a bases for the survey. As it has been explained ATLAS is a Spanish self-report questionnaire of reading abilities for adults that it is able to screen those with difficulties and collect similar information to psychometric tests [40]. It is composed by fifty items and most of them use a Likert scale from 0 (never) to 4 (very frequently). They are organized in sections related to (1) school experience, (2) history of learning difficulties, (3) current difficulties, (4) associated difficulties, (5) family history, (6) reading habits and (7) reading anxiety.

Section (3) current difficulties has two parts. The first one is the core of the questionnaire because it can screen who might have reading difficulties. As it consists of

twelve items and a scale from 0 to 4, the maximum score that can be reached is forty-eight points. Those with a score of 25 or above have reading abilities like adults with a diagnosis of dyslexia [40]. The second part provides additional information in the case of university students.

For our exploratory study, we included forty-two items from ATLAS sections 1, 2, 3, 4 and 7 with modifications after consulting the authors. For example, we adapted the language to familiar terms ("tú" instead of "usted"). The item 15 of section 3 and the 48 of section 8 were written in affirmative to make it easier to understand but they were inverted in the statistical analysis. Furthermore, we added 12 questions to ascertain the level of knowledge and perception of dyslexia, to determine how it affects a degree of communication, and to identify the level of knowledge of the adaptation offered by the University.

Data do not follow a normal distributed according to Kolmogorov-Smirnov test, so we report the median. Although empirical studies have shown that *t* test is robust to violations of normal distribution, the nonparametric analysis approach is preferred when the group sizes are different [41]. As this is our case, Mann-Whitney test is employed.

2.3. Procedure

The final questionnaire, which was accepted by the UA ethics committee, was online, and participants completed it during the classroom time. They were informed about the research purpose and fully anonymity was guaranteed. The time needed to complete it was less than 15 minutes. Respondents answered between November 2021 and March 2022.

3. Results

Appendix A shows all data obtained with the questionnaires, which we will present under different headings.

3.1. Learning difficulties story

Most of our Advertising students learned to read at a normal age (when they were 6.5 years old[1]) but 9.9% (a high percentage according to some studies) of them had problems when learning to read and they achieved this goal to years later ($Mdn = 8$) for ($p < .001$).

On the other hand, 29.6% of our students recognized that it was hard for them to study and memorize, 33.1% said it has been difficult to learn other languages, and 17.3% had to take private lessons each year.

3.2. Dyslexia: diagnosis and treatment

Even though 9% of our students went to a specialist to be evaluated because of reading o writing difficulties, just 7.4% of the Advertising students have an affirmative diagnosis (a little bit above the population) and only 4.6% of followed a treatment.

3.3. Risk of dislexia

3.3.2. Communication difficulties

Therefore, only 7.4% of our students have a dyslexia diagnosis. But there are troubling data with their answers to ATLAS:

[1] Spanish curriculum includes the learning of reading and writing objectives at the age of 6.

-Less than 40% of the respondents say they completely understand well when they read,

-75% have, in some or another way, to read slowly or go back in the text to avoid misunderstandings,

-73% find somehow difficult to remember what they have read,

-49.6% declare that they mix up letters in some way and,

-62.6% say this happens sometimes with words when reading, while 37.7% and 33.8% when writing.

Figure 1 shows the distribution of the overall scores of Atlas questionnaire Section (3) part 1 (view table).

The internal consistency of this part of the questionnaire is $\alpha = .90$. As it has 12 items and a scale from 0 to 4, the maximum score that can be reached is 48 points. The median score is 11 with no differences between men and woman. As stated in Material and Methods, those that reach twenty-five points or more have struggles like adults with dyslexia. 10.9% of our students (that is 31 person) are in this situation. Doing a qualitative request, we realize than, however, only nine of these students have a diagnosis. That is, twenty-two students without diagnosis (7.7%) report important writing and reading problems compatibles with dyslexia.

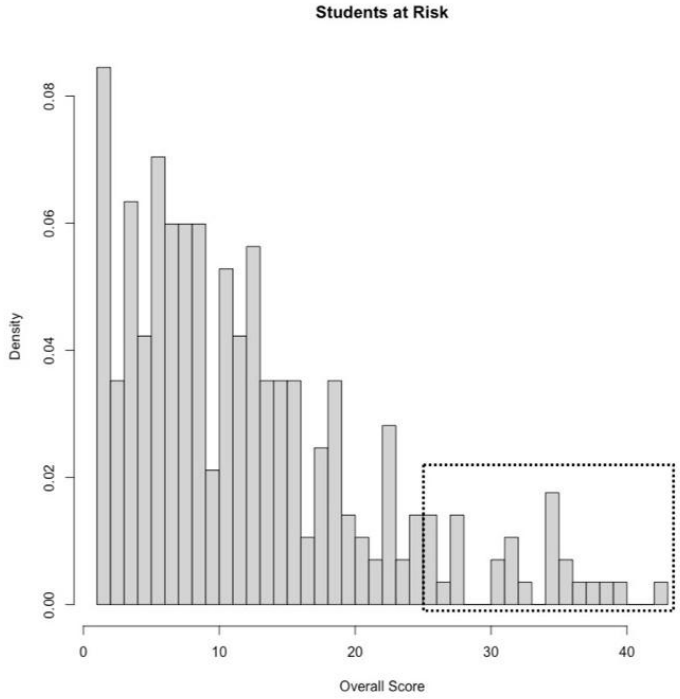

Figure 1. Distribution of the scores (sum of items 13-24) and the cut-off score (25 points).

Atlas questionnaire Section (3) part 2 (view table) provides additional information specific for university students.

As we can see:

- 78% of the pupils have difficulties in "Finding correct words", or "present ideas orally" (76.2%),

- most of them also have difficulties when presenting their ideas orally (73.2%) or planning the time to complete a task (67.3%)[2] while,

[2] The internal consistency of this part of the questionnaire is $\alpha = .86$. This section includes 9 items, so the maximum score is 36. 13.0% of the students have 19 points or more in this section. There are not significant differences in the median score between men and women.

-only 42.6% of the students report difficulties to understand WhatsApp messages or posts.

3.3.3. Anxiety before reading

Anxiety before reading is typical of those students having literacy problems, specifically for women. To measure the degree of reading anxiety of our students, we added the scores of the questions shown in Table of APENDIX A section 7. This section includes 5 items (with an internal consistency of $\alpha = .78$), so the maximum score is 20. A score of 11 points or more indicates that reading provokes a high degree of anxiety. The median score of this section is 3 and the percentage of students with a score of 11 or above is 7.7% and more than a half is undiagnosed. There are not differences between men and women.

But when we cross the anxiety score, with the effective existence of a diagnosis, we see that half of the students who have elevated levels of stress were not diagnosed. Therefore, there was no correspondence between anxiety levels and the diagnosis of reading and writing difficulties, or, in other words, in the case of advertising students, anxiety before reading and writing is not a characteristic of those diagnosed with learning difficulties.

Anyway, examining the response percentages to the stress items one by one, we see that literacy is a disturbing activity for a considerable percentage of individuals:
-63.4% of the students feel somehow uncomfortable when someone sees their spelling,
-57% get somehow tense when having to read or write,
-35.9% worry about having to write a small text,
-33% think their performance is lower due to reading difficulties and,
-19.7% say the subject of reading writing has influenced in the choice of the career in some way.

3.4. Knowledge and attitudes about dyslexia.

Figure 2 shows most used words to define dyslexia by the Advertising students: a "difficulty" in reading and/or writing (69), a "confusion" of letters and/or words when reading or writing (47), as a literacy problem (21), as a "disability" (23) or as a "disorder" (11).

There are anyway still some surprising definitions that show there´s yet a lack of information: "Wanting to say one thing and ending up saying another", "A mental disease that can greatly condition your relationships and life in general" or "Distortion of reality".

Figure 2. Most used words to define dyslexia.

More than half of the respondents (55.3%) say they know someone with reading and writing difficulties and 30.3% say they have helped a peer with reading difficulties. Most of the students (75.4%) are willing to include a person with dyslexia in their team although this means more workload.

But the perception of people with dyslexia is different. Only 2.8% of diagnosed students say they have received help from their peers.

Demands in the career do not seem to be perceived as a barrier. More than half of the advertising students (51.8%) think that a person with reading and writing difficulties would have the same problems in technical degrees than in Advertising and Public Relations, and only 35.2% think that those in the latter degree have more troubles.

According to them, the biggest difficulties that someone with dyslexia might face in this degree are drafting reports and summarizing information (66.5%), understanding texts (57.4%) and oral presentations (50.8). Likewise, there is a consensus about the worth of conferences related to language skills (82%), emotion regulation (70.7%) and time management (61.3%).

But the most relevant assessment is that 91.5% believe that reading ability should be assessed on entry to university to identify those who have difficulties and offer them support.

It is worrying that 24.6% do not know what curricular adaptations are and 49.6% believe that they are necessary but believe that they do not work properly. Furthermore, 41.5% consider that the teacher is not prepared to identify literacy difficulties.

4. Discussion and conclusions

This exploratory report arose from the need to study the causes of the increase in reading and writing difficulties and spelling mistakes detected at the university. The true incidence of dyslexia in higher education is difficult to calculate because diagnosed students do not identify themselves when entering the university, and students with literacy difficulties might be reaching the university without a proper diagnosis or support intervention. Furthermore, the percentage of pupils with struggles seems to vary among degrees. Research indicate that it is more frequent among art students due to the relationship between creativity and dyslexia whereas others find out that the entry grade requirements are determinant.

This work started from the assumption that some students with literacy difficulties may reach the system without diagnosis or support interventions. We knew spelling errors of people with dyslexia overlap with the errors of people without dyslexia, making it difficult to detect this disorder through writing, as it is difficult to discriminate to what extent the errors are due to unfamiliarity with the language or to a neurological disorder.

As we stated in our assumption 1**,** we found a quantitative discrepancy between dyslexia diagnosis and (self-perception) struggles so *there was a higher percentage of students with writing and reading problems that with an official diagnose*. Also, as we stated, *as an Art degree, in Advertising we found a higher percentage of students with writing and reading problems that with official diagnos*e. Despite the assumptions that communication proficiency requirements may expelled people with literacy problems from Advertising Degree, diagnosis and self-diagnosis were higher than that those detected by other studies [32].

In this sense, our results may support the association between creativity degrees and high literacy problems stated by Wolff and Lundberg research [29].

But, on the other hand, *results did not support the assumption that those pupils with dyslexia diagnose would report higher punctuations in the literacy struggles than the rest*. The striking question was that students detected with dyslexia were not those perceiving most literacy difficulties in the questionnaire. Literacy difficulties are "normal" for pupils (there´s no high levels of anxiety) but not in all kinds of situations

This research does not let us respond if literacy problems are due to failures in the detection of individual problems by the system, to a failure of the educational model or to technological influences on individuals. We propose to open a line of research in this direction to investigate the differences between generations and between educational models.

In this sense, it is surprising to note that students have significantly less trouble "decoding" digital communication (as only 42.6% of the students reported difficulties to understand WhatsApp messages or posts.)

The first question that arises for future analysis is to find out whether the increase in reading and writing difficulties has a technological and cultural component: do the new generations have problems in encoding and decoding messages according to the medium? This question opens a whole line of work

In other terms, as assumed, *we found common knowledge about literacy problems that does not correspond to practical interventions*. As this study show, half of the population know someone with dyslexia, but still there are errors when defining the problem.

This ignorance can lead to difficult detection. If accurate diagnosis is a challenge, establishing interventions is an even greater one, as in Spain, only students who have a recognized degree of disability can access to specific resources. But, as this study shows, there might be students whose learning difficulties are not detected by the system and do not receive any help.

Therefore, it might be necessary to provide tools and aid to all students in general and not only to those with a previous diagnosis. In addition, teachers should be trained to offer content in a format that facilitates learning.

We cannot conclude without mentioning the limitations and future lines of this work. Our study focuses exclusively on one degree on one university. It would be convenient to know if our results can be obtained in the same degree of other Spanish universities. Likewise, it will be necessary to compare percentage of students at risk in different degrees at the Universidad of Alicante with the same entry requirements to determine is this is the main discriminant factor.

On the other hand, the ATLAS questionnaire it is useful to screen who might have reading difficulties but other instruments, such as reading and writing task, are necessary to gather more information. Certainly, it is not our goal to reach a final diagnosis because it is the role of the specialists. Yet, lecturers need to know the students struggles to facilitate their learning. We will continue in this line of work by closely monitoring the evolution of our students' spelling mistakes and communication errors, as well as their self-perception of their difficulties to support their needs. In this sense, we plan to conduct a survey among lecturers to determine their knowledge in dealing with these difficulties.

To sum up, this research does not allow us to determine whether this gap between diagnosis and self-perception literacy problems respond to failures in the detection of the system, to a global failure of the educational model or to technological influences on individuals. But overall, we point out that prevalence literacy problems in university could be higher than the expected so it is essential be aware of the neurodiversity that we can find in the classrooms to reach an inclusive education.

This suggests the need to assess reading ability at the beginning of the course to be able to provide specific support to all those who require it, even if they do not recognize or request it.

Appendix A: Data obtained with the questionnaires

ATLAS Section 1: Schooling and learning to read						
Mark the answer closest to your experience (0 = not at all, 4 = a lot).		0	1	2	3	4
1	Did you enjoy going to school?	3.5	7.4	24.6	48.2	16.2
2	Did you have difficulty learning to read?	58.1	22.2	9.9	6.7	3.2
3	At what age do you think you read correctly?	Median: 6.5				
4	Did you have a hard time studying and memorizing?	22.5	25.7	22.2	21.8	7.7
5	Did you find it difficult to learn other languages?	20.1	22.2	24.6	17.6	15.5
6	Did you take private lessons?	17.3 each year				

ATLAS Section 2: History of learning difficulties			
Mark the most appropriate response.		YES	NO
7	Do you think you have difficulty reading?	9.2	90.8
8	Have you ever gone to consultation for reading or learning problems?	9.5	90.5
9	Have you been evaluated for reading or learning difficulties?	10.9	89.1
10	Have you been diagnosed with dyslexia, dysgraphia, dyscalculia or ADHD?	7.4	92.6
11	Have you followed treatment for this type of difficulties?	4.6	95.4
12	If so, for how long? 1 year (4), 3 years (2), more than 4 years (7).		

ATLAS Section 3(1): Current difficulties						
Indicate how often (0 = never, 4 = always).		0	1	2	3	4
13	You mix up letters when reading.	51.4	25.7	9.9	9.5	3.5
14	You mix up words when you read.	38.4	39.8	7.4	10.9	3.5
15	You do not understand well what you read[3].	39.1	33.8	16.9	9.2	1.1
16	You have to read slowly to avoid misunderstanding.	25.0	32.7	19.0	15.8	7.4
17	You often need to go back in the text.	12.7	32.4	26.1	19.7	8.8
18	You mix up letters when writing.	62.3	18.3	5.3	9.2	4.9
19	You mix up words when writing.	66.2	21.8	3.9	5.3	2.8
20	You make spelling mistakes.	31.7	42.6	12.7	4.9	8.1
21	You mix up the order of numbers.	83.5	6.7	4.2	3.5	2.1
22	You find it difficult to read aloud.	55.3	22.9	10.2	6.3	5.3
23	You find it difficult to remember what you have read.	27.1	33.1	22.9	12.0	4.9
24	You find it difficult to express your ideas in writing.	51.4	27.5	10.6	6.7	3.9

ATLAS Section 3(2): Other current difficulties						
Indicate how often (0 = never, 4 = always).		0	1	2	3	4
25	You misunderstand exam questions.	41.9	38.0	11.6	5.6	2.8
26	You take longer to summarize than your peers.	36.6	34.9	14.4	6.0	8.1
27	Despite studying hard, you get low grades.	32.7	36.3	18.7	6.7	5.6
28	You ask for a spelling check before handing in a paper.	59.5	17.3	9.9	7.4	6.0

ATLAS Section 4: Associated difficulties						
Indicate how difficult is (0 = never, 4 = always).		0	1	2	3	4
29	Find the correct word when speaking or writing.	22.2	37.3	23.9	12.0	4.6
30	Pronounce certain words correctly.	47.5	31.0	13.0	5.3	3.2
31	Present your ideas orally.	26.8	31.0	19.7	14.4	8.1
32	Take notes in class.	38.0	31.3	15.8	10.2	4.6
33	Understand WhatsApp messages.	57.4	27.1	8.5	4.9	2.1
34	Recall instructions or new information.	27.8	39.8	17.3	9.9	5.3
35	Understand sign posts in a city or shopping centre.	57.4	21.8	10.9	5.3	4.6
36	Orient yourself (in cities, in the countryside).	34.2	24.3	18.3	10.9	12.3
37	Plan the time to complete a task.	32.7	29.2	14.1	14.1	9.9

ATLAS Section 7: Anxiety before reading						
Indicate your level of agreement (0 = never, 4 = always).		0	1	2	3	4
46	I become tense when I have to read or write	43.0	28.9	13.0	9.9	5.3
47	I perform below my ability because of my reading difficulties.	66.9	19.4	7.0	5.3	1.4
48	I worry about having to read or write a short text.	64.1	20.4	7.4	7.0	1.1
49	My reading difficulties have influenced my choice of studies.	80.3	10.6	5.3	2.1	1.8
50	I don't feel at ease when my spelling is checked.[4]	36.6	21.1	14.4	12.7	15.1

Knowledge, perception and attitudes about dyslexia			
1	How would you define dyslexia?		
2	Do you know anyone with this difficulty?	YES	NO
		55.3	44.7

[3] This item is written in affirmative in the questionnaire but it has to be inverted to calculate the dyslexia risk.

[4] This item is written in affirmative in the questionnaire but it has to be inverted to calculate the anxiety before reading.

3	If you have reading problems, have you received help from your peers[5](0= never, 4 =always)	0	1	2	3	4
		41.2	10.9	8.1	1.4	1.4
4	If you have a colleague with reading problems, have you help him/her?[6] – Yes, most of the time: 30.3 – Not especially: 9.9 – I don't know any: 46.1					
5	Do you think reading ability should be assessed on entry to university in order to identify those who have difficulties and offer them support? – Yes, I think so: 91.5 – I don't think it's particularly relevant: 8.5					
6	Would you be willing to work in a group with someone with dyslexia?[7] – I don't mind, although it means more time or more workload for me: 75.4 – I don't mind, as long as it doesn't mean more time or more workload for me: 20.8 – Under no circumstances would I be willing: 0.4					
7	Do you think a student with reading and writing difficulties can follow a degree in Advertising and Public Relations? – With more problems than a technical degree: 35.2 – With the same problems as a technical degree: 51.8 – With fewer problems than a technical degree: 13.0					

8	In your opinion, what is the biggest difficulty that someone with dyslexia might face in a career like Advertising and Public Relations? (1= not al all, 5= very much)	1	2	3	4	5
	Understanding the texts and discourses to be worked on	3.2	12.3	27.1	35.9	21.5
	Summarising information and writing reports	2.5	9.5	21.5	39.4	27.1
	Carrying out activities that require creativity	48.9	29.6	12.0	7.4	2.1
	Oral presentations	3.5	17.3	28.5	33.5	17.3
	Organising tasks	23.6	33.8	26.8	13.4	2.5
9	The time pressure in the advertising degree and in the advertising work. – It motivates me. I like to work under pressure: 44.4 – I am indifferent to it. It is not something that changes my performance: 34.9 – It is a problem for me: 20.8					
10	Rate the importance of lectures and reinforcement on the following items in the Degree in Advertising and Public Relations (1=not at all; 5=very much)	1	2	3	4	5

[5] 33.5% did not answer this question.

[6] 13.7% did not answer.

[7] 3.5% did not answer.

	– Language skills	2.1	4.9	10.9	33.8	48.2
	– Time management	3.9	8.1	26.8	29.6	31.7
	– Emotional regulation	4.6	6.3	18.3	29.2	41.5
11	What do you think about curricular adaptations for some students? – I don't know what they are: 24.6 – I see them as absolutely necessary, but they don't work properly: 49.6 – I see them as absolutely necessary and they work well: 25.4 – They are not necessary and they entail privileges for some students: 0.4					
12	Do you think that the teaching staff of the degree programme are prepared to identify this type of problem in their students? – Yes: 9.2 – No: 41.5 – I don't know: 49.3					

468

References

1. Suárez Ramírez, S.; Suárez Muñoz, Á.; Guisado Sánchez, I.; Suárez Ramírez, M. La ortografía en el ámbito universitario: una realidad que exige la reflexión del alumnado y la implicación del profesorado. *Didáctica. Lengua y literatura* **2019**, *31*, 135-145. https://doi.org/10.5209/dida.65945
2. Custodio Marcelino, C.; Rodríguez Rosa, C. Y. La ortografía, un breve recorrido hasta formación docente. *InterCambios. Dilemas y transiciones de la Educación Superior* **2021**, *8*, 71-79.
3. Paredes, F. La ortografía: Una visión multidisciplinar. Centro Virtual Cervantes; 1997. Available online: http://cvc.cervantes.es/ensenanza/biblioteca_ele/asele/pdf/08/08_0607.pdf
4. Penas Ibañez, A. Prólogo. In *La puntuación en las redes sociales*; Ridao Rodrigue, S., Ed.; Iberoamericana Editorial Vervuert: Madrid, Spain, 2022; pp. 1-20. https://doi.org/10.31819/9783968693170-001
5. Wimmer, H.; Schurz, M. Dyslexia in regular orthographies: manifestation and causation. *Dyslexia* **2010**, *16*, 283-299. https://doi.org/10.1002/dys.411
6. Lindgrén, S. A. Mild developmental dyslexia in university students: Diagnosis and performance features in L1, L2, and L3. English Department Publication 6; 2012. Available online: http://bibbild.abo.fi/ediss/2012/lindgren_signe.pdf
7. WHO. International Statistical Classification of Diseases and Related Health Problems, 10th Revision. WHO; 1992. Available online: https://ais.paho.org/classifications/chapters/pdf/volume1.pdf
8. Paulesu, E.; Démonet, J.F.; Fazio, F.; McCrory, E.; Chanoine, V.; Brunswick, N.; ... Frith, U. Dyslexia: Cultural diversity and biological unity. *Science* **2001**, *291*, 2165-2167. https://doi.org/10.1126/science.1057179
9. Vellutino, F. R.; Fletcher, J. M.; Snowling, M. J.; Scanlon, D. M. Specific reading disability (dyslexia): What have we learned in the past four decades? *The J. of Child Psychol. Psychiatry and Allied Disciplines* **2004**, *45*, 2-40. https://doi.org/10.1046/j.0021-9630.2003.00305.x
10. Sterling, C.; Farmer, M.; Riddick, B.; Morgan, S.; Matthews, C. Adult dyslexic writing. *Dyslexia* **1998**, *4*, 1-15. https://doi.org/10.1002/(sici)1099-0909(199803)4:1<1::aid-dys87>3.0.co;2-f
11. Brunswick, N.; McDougall, S.; de Mornay Davies, P. (Eds.). *Reading and dyslexia in different orthographies*. Hove: Psychology Press, 2010. https://doi.org/10.4324/9780203858462
12. Rello, L.; Llisterri, J.; Baeza-Yates, R. DysList: An annotated resource of dyslexic errors. In *Proceedings of the Ninth International Conference on Language Resources and Evaluation (LREC'14)*, Reykjavik, Iceland, 2014. European Language Resources Association (ELRA). https://doi.org/10.1007/s10579-015-9329-0
13. Frith, U. Paradoxes in the definition of dyslexia. *Dyslexia* **1999**, *5*, 192–214. https://doi.org/10.1002/(sici)1099-0909(199912)5:4<192::aid-dys144>3.0.co;2-n
14. Shaywitz, B. A.; Fletcher, J. M.; Shaywitz, S. E. Defining and classifying learning disabilities and attention-deficit/hyperactivity disorder. *J. Child Neurol.* **1995**, *10*, S50-S57. https://doi.org/10.1177/08830738950100s111
15. Artigas-Pallarés, J. Dislexia: enfermedad, trastorno o algo distinto. *Rev. Neurología* **2009**, *48*, 63-69. https://doi.org/10.33588/rn.48s02.2009007
16. Pedler, J. *Computer correction of real-word spelling errors in dyslexic text*. Ph.D. **2007**, thesis, Birkbeck College, London University.
17. Salmelin, R.; Kiesilä, P.; Uutela, K.; Service, E.; Salonen, O. Impaired visual word processing in dyslexia revealed with magnetoencephalography. *Annals of Neurology: Official Journal of the American Neurological Association and the Child Neurology Society* **1996**, *40*(2), 157-162. https://doi.org/10.1002/ana.410400206
18. Vizcaíno Breña, E. Análisis sistemático de la relación entre dislexia y ansiedad. TFM. Máster en estudios avanzados sobre el lenguaje, la comunicación y sus patologías https://gredos.usal.es/handle/10366/123852 (accessed on 20 September 2022).
19. Escolar-Llamazares, M. C.; Serrano-Pintado, I. Intervención cognitivo-conductual en un caso de ansiedad ante la lectura en público: mejora de la fluidez y comprensión. *Revista de Psicología Clínica con Niños y Adolescentes* **2019**, *6*(2), 54-61. https://doi.org/10.21134/rpcna.2019.06.2.8
20. Alvarado, H.; Damians, M. A.; Gómez, E.; Martorell, N.; Salas, A.; Sancho, S. Dislexia. Detección, diagnóstico e intervención interdisciplinar. *Revista ENGINY* **2007**, (16-17), 1-26.
21. Alexander-Passe, N. The sources and manifestations of stress amongst school-aged dyslexics, compared with sibling controls. *Dyslexia* **2008**, *14*(4), 291-313. https://doi.org/10.1002/dys.351
22. Carboni-Román, A.; Del Rio Grande, D.; Capilla, A., Maestu, F.; Ortiz, T. The neurobiological foundations of learning disabilities. *Rev. Neurologia* **2006**, *42*, S171-5.
23. Anastasiou, D.; Polychronopoulou, S. Identification and overidentification of specific learning disabilities (dyslexia) in Greece. *Learn. Disabil. Q.* **2009**, *32*, 55-69. https://doi.org/10.2307/27740357
24. Benítez-Burraco, A. Enfermedad de Huntington: fundamentos moleculares e implicaciones para una caracterización de los mecanismos neuronales responsables del procesamiento lingüístico. *Rev. neurol* **2009**, *48*, 75-84. https://doi.org/10.33588/rn.4802.2007473
25. Soriano-Ferrer, M.; Martínez, E. P. Una revisión de las bases neurobiológicas de la dislexia en población adulta. *Neurología* **2017**, *32*, 50-57. https://doi.org/10.1016/j.nrl.2014.08.003

26. González, D.; Jiménez, J. E.; García, E.; Díaz, A.; Rodríguez, C.; Crespo, P.; Artiles, C. Prevalencia de las dificultades específicas de aprendizaje en la Educación Secundaria Obligatoria. *Eur. J. Educ. Psychol.* **2010**, *3*, 317-327. https://doi.org/10.30552/ejep.v3i2.60
27. Stampoltzis, A.; Polychronopoulou, S. Dyslexia in Greek higher education: A study of incidence, policy and provision. *Journal of Research in Special Educational Needs* **2008**, *8*, 37–46. https://doi.org/10.1111/j.1471-3802.2008.00100.x
28. Mortimore, T.; Crozier, W. R. Dyslexia and difficulties with study skills in higher education. *Stud. High. Educ.* **2006**, *31*, 235–251. https://doi.org/10.1080/03075070600572173
29. Wolff, U.; Lundberg, I. The prevalence of dyslexia among art students. *Dyslexia* **2002**, *8*, 34-42. https://doi.org/10.1002/dys.211
30. Chakravarty, A. Artistic talent in dyslexia—A hypothesis. *Med. Hypotheses* **2009**, *73*, 569-571.
31. Bacon, A. M.; Bennett, S. Dyslexia in Higher Education: the decision to study art. *European Journal of Special Needs Education* **2013**, *28*, 19-32. https://doi.org/10.1016/j.mehy.2009.05.034
32. López-Escribano, C.; Suro Sánchez, J.; Leal Carretero, F. Prevalence of developmental dyslexia in Spanish University Students. *Brain sciences* **2018**, *8*, 82. https://doi.org/10.3390/brainsci8050082
33. Fernández Guerrero, A.B. El fracaso escolar. *Revista Innovación y Experiencias Educativas* **2011**, *40*(1).
34. Felgueroso, F.; Gutiérrez-Domènech, M.; Jiménez-Martín, S. (2014). Dropout trends and educational reforms: the role of the LOGSE in Spain. IZA *Journal of Labor Policy* **2014**, *3*(1), 1-24. https://doi.org/10.1186/2193-9004-3-9
35. Gilger, J. W.; Pennington, B. F.; DeFries, J. C. Risk for reading disability as a function of parental history in three families studies. *Read. Writ.* **1991**, *3*, 205-18. https://doi.org/10.1007/bf00354958
36. Schulte-Körne, G.; Deimel, W.; Remschmidt, H. Can self-report data on deficits in reading and spelling predict spelling disability as defined by psychometric tests?. *Read. Writ.* **1997**, *9*, 55-63. https://doi.org/10.1023/a:1007941403441
37. Giménez, A.; Luque, J. L.; López-Zamora, M.; Fernández-Navas, M. Autoinforme de trastornos lectores para adultoS (ATLAS). *An. Psicol.* **2015**, *31*, 109-119. https://doi.org/10.6018/analesps.31.1.166671
38. AQU. La opinión del colectivo empleador sobre la formación de las personas tituladas en Comunicación **2019** Barcelona: AQU
39. Álvarez-Flores, E. P.; Núñez-Gómez, P.; Olivares-Santamarina, J. P. Perfiles profesionales y salidas laborales para graduados en Publicidad y Relaciones públicas: de la especialización a la hibridación. *El profesional de la información (EPI)* **2018**, *27*, 136-147. https://doi.org/10.3145/epi.2018.ene.13
40. Giménez, A.; Ortiz, A.; López-Zamora, M.; Sánchez, A.; Luque, J. L. Parents' reading history as an indicator of risk for reading difficulties. *Ann. Dyslexia* **2017**, *67*(3), 259-280. https://doi.org/10.1007/s11881-017-0143-9
41. Harpe, S. E. How to analyze Likert and other rating scale data. *Currents in pharmacy teaching and learning* **2015**, *7*, 836-850. https://doi.org/10.1016/j.cptl.2015.08.001