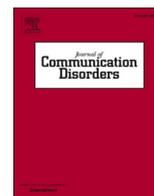




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## How aware is the public of the existence, characteristics and causes of language impairment in childhood and where have they heard about it? A European survey

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### ARTICLE INFO

#### Keywords:

Language impairment  
Children  
Developmental language disorder  
Awareness  
Public  
Europe

### ABSTRACT

Public awareness of language impairment in childhood (Developmental Language Disorder (DLDD)) has been identified as an important determiner of research and clinical service delivery, yet studies directly assessing public awareness are lacking. This study surveyed awareness across 18 countries of Europe.

*Method:* A questionnaire developed by an international team asked whether respondents had heard of language impairment affecting children, what they thought its manifestations and causes were and where they had heard of it. Respondents were also asked whether they had heard of autism, dyslexia, ADD/ADHD and speech disorder. The questionnaire was administered to members of the public in 18 European countries. A total of 1519 responses were obtained, spanning 6 age groups, 4 educational level groups and 3 income level groups.

*Results:* Across all but one country, significantly fewer people had heard of language impairment than any of the other disorders (or 60 % compared to over 90 % for autism). Awareness tended to be lowest in Eastern Europe and greatest in North-Western Europe, and was influenced by education level, age and income level. People in countries with overall low and overall high awareness differed in their views on manifestations and causes. People had heard of language impairment and autism the same way - most frequently through the media, including Internet, and less frequently through their child's school or a medical professional.

*Discussion:* The study confirms that awareness of language impairment and knowledge of the breadth of its manifestations are low. It also suggests opportunities for how to increase awareness, including greater media coverage of language impairment and more efficient use of venues such as schools and healthcare. Ways in which cultural and linguistic differences may influence public awareness efforts are discussed, including the translatability of clinical labels and scientific terms. These may impact the acceptance of a common term and definition across all countries. As awareness campaigns are gaining momentum, the findings of this study can serve as a baseline against which to compare future findings.

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<sup>1</sup> COST Action IS1406 “Enhancing children’s oral language skills across Europe and beyond – a collaboration focusing on interventions for children with difficulties learning their first language”.

<https://doi.org/10.1016/j.jcomdis.2020.106057>

Received 25 February 2020; Received in revised form 23 September 2020; Accepted 4 October 2020

Available online 19 November 2020

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## 1. Introduction

Client perspectives are an important part of service delivery and intervention for communicative disorders, constituting one of the three pillars of evidence-based practice (EBP) (Sackett, Richardson, Rosenberg, & Haynes, 1997). Public awareness and knowledge of particular disorders influence clinical services in important ways. An uninformed public does not know where to turn for information in the health care or educational system and is ill equipped to find relevant information through other sources such as the Internet. A uniformed public does not recognize the warning signs of a disorder that would otherwise lead them to seek early services and does not pressure their educational and health care system for such services. There has been much recent focus on the need for more public awareness of language impairment occurring in childhood, now widely referred to as Developmental Language Disorder (DLD); a major international awareness campaign has been launched to increase public awareness of DLD (RADLD, 2020). As early as 2004, Kamhi pointed out that outside of the ranks of speech-language pathologists, few people seemed to know about language related disorders in childhood in contrast to other disorders such as dyslexia and Asperger's syndrome with which the public seemed to be more familiar. In spite of the many discussions of the problem of low public awareness of DLD (Bishop, 2017; Kamhi, 2004; Norbury & Sonuga-Barke, 2017), there are, to our knowledge, no previous studies directly documenting public awareness levels of DLD.

Despite the lack of DLD awareness studies, a few studies have focused directly on awareness in the context of general communication disorders or specific disorders such as stuttering, knowledge of speech-language pathology and/or delivery of services to children (Aydin Uysal & Tura, 2019; Breadner, Warr-Leeper, & Husband, 1989; Mahmoud, Aljazi, & Alkhamra, 2014; Mustafa & El-Rabie Ahmed, 2018; Topbaş, 2006). All of these studies placed specific emphasis on the need to increase awareness and change attitudes of individuals in some occupations, such as medical doctors, but none of them focused specifically on DLD. Nevertheless, there is widespread agreement that DLD is a hidden disorder – a quick search of the internet reveals numerous websites dedicated to this issue. Researchers have shown that an underlying language impairment is often not recognized as such or even properly examined in children who are given other labels based on the surface manifestation of their difficulty, such as difficulty in reading comprehension (Catts, Comton, Tomblin, & Bridges, 2012; Nation, Clarke, Marshall, & Durand, 2004). In teenagers, the use of measures that do not target sophisticated language skills may prevent evaluators from detecting a problem in the area of language (Nippold, Mansfield, & Tomblin, 2008). Thus, even within countries with well-established traditions of speech language pathology (SLP) services, language impairment is in too many cases not being identified or treated as such. In countries with less well established SLP services, the rate at which people with language impairment are under-served is reported to be particularly high (McAllister, Wylie, Davidson, & Marshall, 2013). Across cultures, communication, cognitive and behavioral disabilities have been described as being at the bottom of a “pecking order” of disabilities (Wickenden, 2013, p. 16), and seen as such both by people within and outside of the circles of people with disabilities, due to stigmatization and lack of understanding. Indeed, according to the World Report on Disability (World Health Organization & the World Bank, 2011), people with mental and communication disability are excluded from services and the labor market significantly more than people with physical or visual impairments.

One of the main objectives of the CATALISE Consortium in promoting the use of a single term, DLD, was that the lack of uniformity in nomenclature gets in the way of the public being able to understand what language impairment is and how it affects children in their various activities (Bishop, Snowling, Thompson, & Greenhalgh, 2016; (Bishop et al. 2017). The fact that different clinicians may use different terms makes it difficult for parents to seek further information or to discuss the issue with other parents whose children experience similar difficulties. Research is impacted as well. As shown by Bishop 2010; 2014), autism research receives more research funding and more studies have been published on autism than on DLD despite autism being far less prevalent (prevalence estimates are 3.4/1000 for autism, compared to 7/100 for DLD (Tomblin et al., 1997; Yeargin-Allsopp et al., 2003). Kamhi (2004) discusses aspects of terms and constructs that make them more or less easily adopted by the public. He points out that the success of a term in gaining popularity is not necessarily a function of its accuracy from a scientific point of view but rather a function of whether it is catchy and

**Table 1**  
Terms used for Childhood Language Impairment in the Public Survey in each country and their rough English translation.

Country – Language	Term used in public survey	English translation
Austria - German	Sprachstörung	Language impairment
Bulgaria – Bulgarian	Езиково нарушение	Language impairment
Croatia - Croatian	Jezične teškoće u djetinjstvu.	Language impairment in childhood.
Cyprus – Greek	Ειδική Γλωσσική Διαταραχή	Specific language impairment
Estonia –Estonian	Arenguline keelepuue	Developmental language disorder
Hungary - Hungarian	Gyermekekori nyelvi zavar	Childhood language impairment
Iceland - Icelandic	Málhömlun/málproskaröskun barna	Language impairment/disorder of language development in children (both terms provided)
Israel - Hebrew	לקות שפה	Language disorder/impairment (it has only one translation in Hebrew)
Latvia - Latvian	valodas traucējumi bērniem	Childhood language impairment
Lithuania - Lithuanian	Kalbos sutrikimas (kalbos neišsivystymas)	Language impairment
Malta – English	Specific language impairment	Specific language impairment
Netherlands - Dutch	Taalontwikkelingsstoornis (TOS)	Developmental Language Disorder
Poland – Polish	Specyficzne zaburzenie językowe	Specific language impairment
Romania – Romanian	Retard de limbaj	Language delay or language retardation
Spain – Spanish	Trastorno del lenguaje infantil	Childhood language impairment
Sweden –Swedish	Språkstörning	Language impairment
Turkey – Turkish	Çocukluk çağı dil bozukluğu	Childhood language disorder

whether it satisfies the public's need to know what they want to know. Parents of children with developmental disorders, he contends, are not attracted to terms that signal complexity and controversy but rather to terms that refer to a simple construct and a simple cause, suggesting a simple solution, or at least a possible solution (Kamhi, 2004). In that regard, consistent with Bishop et al. 2017, the multitude of previous terms for DLD and uncertainties and debates about its possible causes, while they may reflect the true state of the art of scientific discovery, work against public awareness.

The present study took advantage of a large international research network (COST Action IS1406) to survey public awareness of the construct now referred to as DLD but which has historically been referred to by many labels in English, and by an even greater number of labels when other languages are considered. It is important to specify that the new term DLD was launched in 2017, the same year as this study began. Even though many of the participating countries have subsequently adopted a direct translation equivalent of the term DLD, such change and awareness campaigns that may have been launched in these countries to publicize it, had not yet occurred at the time of the study. Therefore, this study examined public awareness of the *concept* of DLD, not of the *term* DLD, and it did so before widespread adoption of the term DLD. In each country in which the survey was conducted, the term most likely to be used in that country to refer to childhood language impairment at the time the survey was conducted was used (see Table 1).

Beliefs, conceptualisations, and practices related to language disorders and service delivery are known to vary culturally (see e.g. Elin Thordardottir & Topbaş, 2019). Across cultures, differences exist in how people communicate with their children (e.g. Burns & Radford, 2008; Roseberry-McKibbin, 2014; Simmons & Johnston, 2007; Van Kleeck, 1994). Similarly, differences are found in whether parents think that deviations from the most typical developmental path should be considered to be an impairment or handled in a special way, and these differences exist even where parents are aware of such deviations (e.g. Marshall, 2000; Mendez-Perez, 2000). Beliefs about speech and language intervention can impact parent's decision to seek services (Roulstone & Harding, 2013; Stockman, Boulton, & Robinson, 2004). For instance, in Turkey highly religious and illiterate families especially from rural areas take their children to Hodjas, in order to be cured by 'praying type rituals' (Topbaş, 2006). In Egypt, Mustafa and El-Rabie Ahmed (2018) showed that, especially in upper Egyptian traditional medicine, cultural beliefs hold that electricity, eating a crow's tongue, a bee sting, or swallowing raw amber are a cure or treatment for DLD and help children speak. The authors noted that these cultural beliefs are common even among educated people and are reflected in the society's healthcare system. These are examples of views that contrast sharply with views most commonly associated with scientific explanations of DLD; other cultural differences may be less striking but still a reality.

The CATALISE study (Bishop et al., 2016, 2017), which is central to current awareness campaign efforts using the new label DLD, had an international component spanning three continents, however only comprising English-speaking countries. The present study brings a greater linguistic and cultural diversity to the discussion of DLD awareness and understanding. English-speaking countries maintain a degree of cultural similarity that may be enhanced both by a common cultural history and an unbroken ability to communicate over time. The fact that English is the main language of scientific publications also sets it apart from other languages. First, it greatly facilitates English-speaking clinicians' ability to understand newly published research – which may be impossible for clinicians and may be hard even for researchers in non-English speaking countries. Second, the use of English in international publications and conferences promotes an English understanding of scientific and, in this case, clinical concepts as being the internationally agreed-upon concepts. As an example of this, the CATALISE consortium chose the term *disorder* over *impairment*, because it was felt to convey the seriousness of DLD better. Some members of the consortium voted to go further in this direction, suggesting more medical terms comparable to terms such as *dyslexia* (Bishop, 2017). In translating the survey used in the present study into the various languages, it was noted that the distinction between *impairment* and *disorder* is not readily made in many languages and certainly not by the use of single words. It might be possible to capture the distinction by rewording it into a phrase, but this would not make for a catchy label that would ensure greater awareness of the condition referred to as DLD in English. As a result, translations of these terms may result in differences in how their meaning is perceived by professionals as well as by the public. It is interesting to speculate on the term chosen for DLD had other languages been involved in the discussion. Other examples of wording that proved hard to translate into some languages included *intervention* and *therapy*, as well as *services*. The word *developmental* does not exist as an adjective in all languages, and in some languages is confounded with translation equivalents of *evolution*.

Beyond linguistic differences, differences in clinical service delivery and research and clinical traditions also exist between countries. Researchers have contrasted developing and developed countries (or Majority and Minority world countries) in this respect (Wylie, McAllister, Davidson, & Marshall, 2013), but differences also exist within each of these worlds – within Europe, striking differences are summarized in chapters on the history of DLD in each of 37 European countries in Law, McKean, Murphy and Elin Thordardottir (2019) as well as in other recent studies (Aydin Uysal & Tura, 2019; Topbaş, 2006; 2014; Topbaş, Günhan, & Bulut, 2019). Differences in traditions can make it difficult for researchers, clinicians and the public to equate English nomenclature to the nomenclature previously used in their own country for identification and access to services. Whereas the new DLD label replaces a number of previous English terms, many non-English speaking countries previously worked with terms that did not directly match any previous English terms; an example is the French term *dysphasie*, which is at the same time narrower and broader in scope than Specific Language Impairment or DLD, as it includes only children with severe disorders, but does include children who present primarily with speech disorders (Le Normand, 2003; Elin Thordardottir et al., 2011).

### 1.1. Aims of study

The purpose of this study was to survey public awareness of language impairment in children in European countries. Specific questions included the following:

**Table 2**

Background variables of participants, shown for the entire sample in terms of total number of participants (n) and percentage of sample (%), and for each country in terms of number of participants (n). Variables shown include Gender (Females, Males), Age (six groups from 18y to 70+y), Education level (4 levels from primary to postgrad), Income level (three groups: low, middle, high), Whether the participant is the parent of a child under age 18 years or not, and whether the participant routinely uses two languages or one language.

	Entire sample (n)}	Entire sample (%)}	Austria (n)}	Bulgaria (n)}	Croatia (n)}	Cyprus (n)}	Estonia (n)}	Hungary (n)}	Iceland (n)}	Israel (n)}	Latvia (n)}	Lithuania (n)}	Malta (n)}	Netherlands (n)}	Poland (n)}	Romania (n)}	Russians in Swe. (n)}	Spain (n)}	Sweden (n)}	Turkey (n)}
Females	937	57.9	58	38	42	34	48	129	30	53	53	19	70	36	27	38	49	69	100	45
Males	576	37.9	35	37	40	18	45	77	14	16	12	9	36	39	48	37	0	43	28	42
18-29y	377	24.8	21	18	23	24	22	40	11	27	28	5	17	21	16	12	2	32	28	30
30-39y	266	17.5	10	7	6	9	14	31	7	2	24	7	14	5	9	13	13	22	42	30
40-49y	305	20.1	10	14	15	2	29	46	10	4	7	7	28	13	17	13	20	19	24	27
50-59y	232	15.3	20	11	12	10	13	37	7	18	5	6	19	13	8	12	11	11	19	0
60-69y	189	12.2	15	14	19	6	10	27	9	10	0	4	3	16	18	12	3	12	10	0
70+y	150	9.9	15	11	7	1	5	25	5	8	1	0	25	7	7	12	0	16	5	0
Prim. Ed.	112	7.4	1	0	2	1	5	30	6	0	0	0	12	0	2	0	0	16	1	36
Sec Ed.	508	33.4	52	22	40	16	22	105	11	12	35	5	37	24	16	22	3	36	32	18
Bachelor's	465	27.7	16	16	18	32	15	33	13	29	19	18	20	49	34	33	13	46	36	24
Postgrad.	430	33.7	22	37	22	3	51	38	19	28	11	6	35	1	23	20	33	13	57	9
Income L	302	19.9	16	7	39	0	25	28	15	2	16	3	19	12	26	20	6	26	31	11
Income M	1025	67.4	64	46	40	32	56	173	27	41	49	26	79	51	36	50	40	81	73	60
Income H	160	10.5	9	7	3	7	12	47	7	26	0	0	8	12	13	5	3	5	23	16
Child<18	489	32.2	14	14	16	8	33	158	18	16	37	10	36	20	21	30	33	31	71	33
No ch. < 18	1027	67.5	77	60	65	44	60	42	31	53	28	19	70	34	54	45	16	81	58	54
2 lang.	693	45.6	13	14	10	13	13	163	4	9	19	3	71	14	9	11	35	6	74	10
1 lang.	823	54.1	78	59	71	39	80	43	44	50	46	26	35	61	66	64	14	106	55	77
Total n	1519		91	75	82	52	93	206	49	69	65	29	106	75	75	75	49	112	128	93

- 1 How aware is the public of language impairment in childhood (CLI), corresponding to the concept of DLD?
- 2 How does the level of awareness of language impairment compare with awareness of other disorders that have been reported to be better known by the public, including autism, dyslexia, attention deficit and speech disorders?
- 3 Beyond documenting mere awareness of the existence of language impairment in childhood, what ideas does the public have of the nature of language impairment in childhood, how it manifests and what its causes are?
- 4 Where has the public heard of language impairment in childhood and does this differ from where they have heard of other disorders of which they might be more aware?

Given cultural differences and differences in clinical traditions across countries, it was hypothesized that differences might be found in all these respects across countries as well as across demographic groups according to age, education and income level. This study examined country differences in terms of overall awareness levels and broad categorizations of most common views on the nature and causes of CLI across countries. A more detailed analysis of country differences and how these might interact with demographic variables is beyond the scope of this study.

## 2. Method

The study was conducted by Working Group 3 (WG3) of Cost Action IS1406 (“Enhancing children’s oral language skills across Europe and beyond – a collaboration focusing on interventions for children with difficulties learning their first language”). (COST Actions are EU-funded research networks which, once accepted, are open to all European countries as well as some neighboring countries. Participating countries receive funding to send two representatives to meetings held twice per year. Members of this COST Action included researchers and clinicians.) The survey used in the study and the study protocol were designed by WG3. Data were collected by members of WG3 and by members of the COST Action who were not part of WG3. All members of WG3 and COST Action members who contributed data are listed in the Acknowledgements.

### 2.1. Participants

As per the protocol, each participating country aimed to collect a minimum of 75 responses, with 25 people in each of 5 age groups: 18–39 years, 40–49 years, 50–59 years, 60–69 years, and 70+ years. A total of 1519 responses were obtained to the final version of the Public Survey from 18 countries: Austria, Bulgaria, Croatia, Cyprus, Estonia, Hungary, Iceland, Israel, Latvia, Lithuania, Malta, the Netherlands, Poland, Romania, Spain, Sweden, and Turkey. In addition, the Swedish team collected data on Russian speakers living in Sweden and in Russia. Those data are treated as if they were from a separate country, for a total of 18. Background characteristics are presented in Table 2 for the entire sample and for each country. The sample has roughly twice as many female as male participants. Overall, all 5 age groups are fairly evenly represented, as are the 3 highest education levels; fewer respondents had very little education. The vast majority of respondents report to be of middle level economic status. A third of the respondents are parents of children under age 18 and 45 % of respondents report using more than one language routinely. Inspection of data from individual countries reveals a fairly equal distribution of age groups in most countries with the exception of Cyprus, and Israel with a third to roughly half of respondents in the youngest age groups, and Latvia and Turkey with respondents only in the youngest two and three groups, respectively. Similarly, educational levels are evenly distributed in most countries. Hungary, Turkey and Malta have the largest proportions of respondents with primary education only. Some differences are found in income levels across countries: the sample from Cyprus has no low-income representation, whereas Latvia has no high-income representation and Hungary very little. Half of the sample from Israel reports high-income levels. While the overall sample is fairly well balanced, these differences between countries mean that comparison of results across countries must be viewed as tentative in particular for those countries whose samples are small and unevenly distributed across demographic groups.

Data collection within each participating country was the responsibility of representatives from that country within the research network. Recruitment was done by word of mouth, and through social media. Because the researchers in this COST Action are specialized in the area of language impairment, recruitment aimed to avoid sampling people whom they knew personally in order to avoid over sampling people who happened to know a professional in the area of child language. Thus, recruitment aimed for acquaintances of acquaintances. Respondents were not provided other instructions than those written on the survey. The survey was anonymous. Participants indicated their consent by filling out the survey. Ethics approval for the study, including analysis of the aggregated data, was obtained from the Institutional Review Board of the Faculty of Medicine of McGill University who considered it to involve minimal risk. Participating countries were responsible for fulfilling any additional ethics requirements in their countries. They were provided a copy of the ethics approval for the overall study to expedite processing of their applications.

### 2.2. Procedure

The Public Survey used in this study was developed in meetings of WG3 over the course of 3 work meetings spaced approximately 6 months apart. Each of the meetings was led by the two leaders of WG3, the second and first author of this article, who also ensured the final editing and compiled the data from the various participating countries. The steps are outlined in Fig. 1. A pilot version of the questionnaire was developed in 2016 and was subsequently piloted in 11 countries; within each country in a translated version developed by representatives of the respective countries. Each country was instructed to use the term deemed most commonly used in contexts involving the public and thus most likely to be recognized by the public signifying “childhood language impairment”,

meaning an impairment impacting language rather than primarily speech. The pilot version yielded 128 responses from 11 countries. The pilot data were analyzed in the lab of the second author who, together with a research assistant, combined and analyzed the data from all countries. The results were then shared at the 3rd WG3 meeting. The subsequent revision of the questionnaire was based not only on results from the pilot version, but also on consideration of appropriate questions to ask in various countries and appropriate wording of questions in different languages. Changes resulting from the pilot study involved the sampling strategy, which, in the revised version, included more age groups and an attempt to reach an equal number of men and women. Edits to the questionnaire itself included reordering items and the addition of headings, removing, merging and adding some questions, and rewording of questions that were deemed not to be sufficiently clear or that gave rise to misunderstanding. This revision allowed opportunity for a detailed group discussion on every item of the questionnaire which focused on issues encountered in translation and cultural fit of the questions, leading to careful rewording of many questions. Finally, the revised version asked those who say they have not heard of childhood language impairment to skip questions on its nature and go straight to questions on sharing information and other disorders.

The final version of the questionnaire, completed at the management committee meeting in Limerick in May 2017, reflects a consensus among the international working group of researchers who developed it (see Supplementary Material). The final survey contains questions in 5 sections (not all of which are covered in this article but will be reported on separately): A) demographic information (10 questions), B) questions about the nature of language impairment in childhood, including its manifestations and causes (9 questions, of which 1 is open ended and 5 include tables with multiple items to which respondents gave *yes/no* or *I don't know*

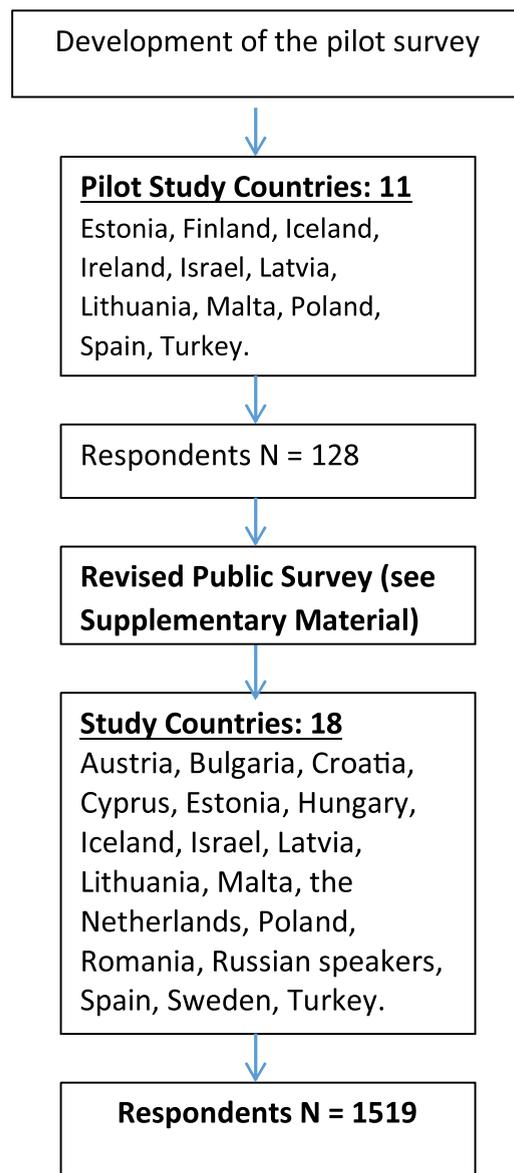


Fig. 1. Outline of the steps in development of the Public survey and data collection.

answers), C) questions about intervention services (5 questions of which 2 have tables with multiple items), D) questions about the role of parents in identification and remediation (4 questions involving tables with multiple items), E) questions about awareness of autism, dyslexia, ADD/ADHD and speech disorders (3 questions with multiple options). In this article, we report on responses to questions A) demographics, B) questions about awareness of CLI and two table questions with multiple response options on the manifestations of CLI and possible causes of CLI, and E), awareness of autism, dyslexia, ADD/ADHD and speech disorder, and where the public had heard of those. Open-ended questions are not reported on here. The options provided for characteristics and causes of CLI were based on manifestations and causes of CLI reported on in the literature (e.g., Leonard, 2014; Paul, Norbury, & Gosse, 2017) and on WG3 members' expertise and knowledge of their countries. Thus, these choices are heavily based on English-language literature, but also on member's knowledge of publications and cultural differences in their own countries. As an example, members from some countries suggested that possible causes the public might associate with language impairment might include being possessed by demons or being punished by God and some suggested that having a child with language impairment might lead some parents to be ashamed of their child and to hide the child from strangers. Whether to include items such as these sparked vivid discussion within the group, as some argued that such items reflect discrimination and were as such inappropriate whereas others viewed them as reflecting facts that needed to be documented.

The nature of CLI was not defined in the questionnaire, as a main purpose was to see whether respondents were familiar with the concept associated with the term used in each country and what they thought it was. Further, questions on autism, dyslexia, ADD/ADHD and speech disorder were deliberately left until the very end in an attempt not to bias respondents into thinking of these terms as they answered questions about CLI. At the beginning of Section B) on the nature of CLI, respondents who responded NO to the question of whether they had heard of CLI were directed to go straight to section D), thus a smaller number of respondents answered section B) than sections A) and D).

### 2.3. Administration of the survey

Participating countries were instructed to translate the final version into the language(s) of their country, as appropriate. It was acknowledged that some countries might want to administer the survey in more than one language – thus there is not strictly a one-to-one correspondence between countries and languages. When choosing a term for CLI, each country was asked to use the term that is used most commonly or is expected to be most familiar to the public. In this regard, participants were given this directive: "The phenomenon of interest here is when children have pronounced difficulty learning their own native language in terms of its vocabulary, syntax etc. We are concerned with children's **ORAL** abilities (rather than reading and writing, although these may become part of the problem later) and we are **NOT** focusing on **speech** problems (mispronunciations, articulatory disorders). If no specific term is in use in the country, a descriptive term should be used." The actual terms used in each country are listed in Table 1 along with an English translation. In the one country that administered the survey in English (Malta), the term Specific Language Impairment was used. In some cases, the term used in the survey was not the one used for official purposes in that country (in Spain, the term used was *Trastorno del Lenguaje Infantil* (Childhood language disorder), whereas the official term is *TrastornoEspecífico del Lenguaje* (Specific Language

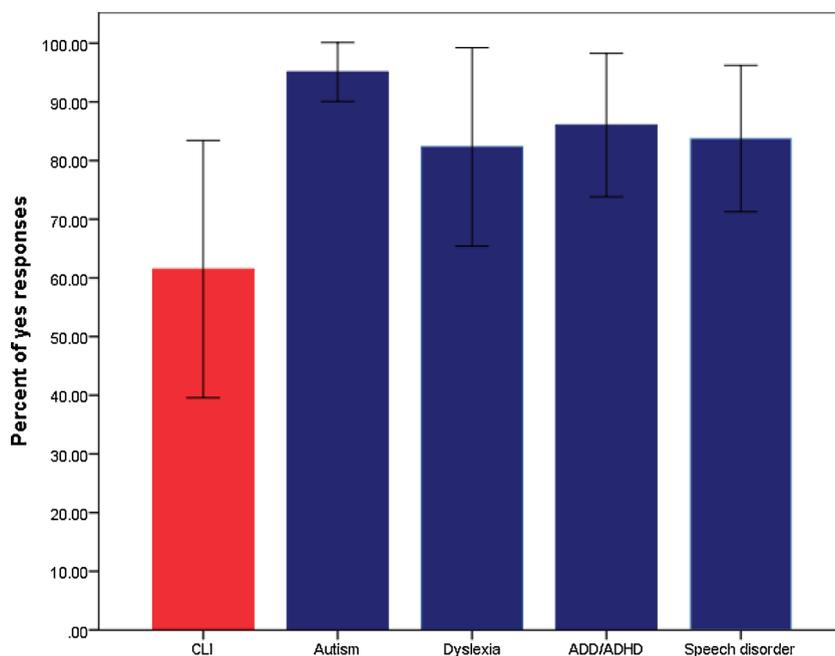


Fig. 2. Mean percentage of respondents across all countries who responded yes to the question of whether they had heard of Childhood Language Impairment (CLI), Autism, Dyslexia, ADD/ADHD and Speech disorder. Error bars represent 1 SD.

Disorder).

The survey was administered in a paper format except for a part of the sample surveyed by the Swedish team. The reason for using a paper format was related to the resources available. COST Action grants provide funds to bring European researchers together to share knowledge and plan joint projects, but do not provide operating funds to conduct research projects. In this project, preparing an electronic survey in each of the languages exceeded the available resources.

#### 2.4. Data compilation

Participating countries were provided an excel spreadsheet and an answer key that instructed them on how to enter the responses from their country, excluding the open-ended questions which are not considered here. A research assistant in the first author's lab combined the data from all countries in a single SPSS spreadsheet, and liaised with the teams of different countries in cases where data entry was not clear. The present study reports on overall data from all participating countries. Each country may publish a more in-depth analysis of data from their own country (see Zegan, Totolan, Dascalu, Golovcencu, and Anistoroaei (2019) on Romanian data and Kement, Topbaş, and Bulut (2020) on Turkish data).

### 3. Results

#### 3.1. Awareness of CLI, autism, dyslexia, ADD/ADHD and speech disorders

Fig. 2 displays the mean percentage of respondents from each country who answered *yes* to the questions of whether they had heard the terms Childhood Language Impairment (CLI), autism, dyslexia, ADD/ADHD and speech disorders. Overall, 58.9% reported to have heard of CLI, with *yes* response rates across countries ranging from 13.4–93.1%. In comparison, 95.1% of respondents reported having heard of autism, with rates ranging from 82.8–100%. The ranges for the other disorders inquired about were 49.4–100% for dyslexia, 58.5–100% for ADD/ADHD, and 51.9–98.7% for speech disorder. Looking across countries, a larger percentage of respondents had heard of autism than CLI in every single country, in many cases twice or three times as many, with the exception of Lithuania, where 93.1% of people had heard of both autism and CLI. To test for statistical differences, the mean percentage of *yes* responses to CLI across countries was compared to the *yes* response rates to each of the other diagnoses inquired about using paired samples *t*-tests. A Bonferroni correction was applied, testing each of the 4 comparisons at an alpha level of  $0.05/4 = 0.0125$ . Each of the 4 comparisons was statistically significant: CLI versus autism:  $t(16) = -6.700$ ,  $p < .001$ , Cohen's  $d = 1.86$ ; CLI versus dyslexia:  $t(16) = -3.537$ ,  $p = .003$ , Cohen's  $d = 1.07$ ; CLI versus ADD/ADHD:  $t(16) = -4.911$ ,  $p < .001$ , Cohen's  $d = 1.38$ ; CLI versus speech disorder:  $t(16) = -4.126$ ,  $p = .001$ , Cohen's  $d = 1.25$ .

Table 3 presents the demographics of respondents who said they had heard of CLI by showing the percentage of people in each age group, each educational group and each income group who answered *yes*, *no* or *I don't know* to that question. Descriptively, Table 3

**Table 3**

Background characteristics of respondents in relation to whether they had heard of Childhood Language Impairment (CLI). The table shows the percentage of people in each demographic group listed in the column to the left who responded *yes*, *no* or *I don't know* to having heard of CLI.

	YES	NO	I DON'T KNOW
AGE GROUP	%	%	%
18-29 years	52.4	43.9	3.7
30-39 years	57.9	39.0	3.0
40-49 years	62.3	35.0	2.7
50-59 years	66.7	28.1	4.8
60-69 years	66.7	30.1	2.7
70+ years	51.3	47.3	0.01
GENDER:			
Female	64.3	32.1	3.6
Male	51.1	32.1	2.4
EDUCATION:			
Primary school	44.1	52.3	3.6
Secondary school	50.5	46.5	2.4
Bachelor's degree	63.9	33.3	2.8
Postgraduate degree	68.5	28.3	3.4
INCOME:			
Low income level	50.7	45.9	3.0
Middle income level	60.9	35.6	3.1
High income level	67.9	29.6	2.5
FAMILY:			
Parent of child under 18	63.8	33.9	
Not a parent of child under 18	57.9	39.2	
BILINGUALISM:			
Routinely speaks 2 languages	60.6	36.0	3.2
Routinely speaks 1 language	57.9	38.8	3.0

shows that more people respond *yes* than *no* in every age group and that *yes* response rates are somewhat higher in the age groups from 40 to 69 years. *Yes* responses increase systematically with higher education and higher income levels. Being the parent of a child under 18 years and using two languages on a regular basis appear to have only a small impact on response rates. Overall, *I don't know* responses are few.

For the sample as a whole the relationship between the background variables in Table 3 and answering *yes*, *no* or *I don't know* to having heard of CLI was analyzed statistically through contingency table analysis, with the Pearson Chi square test of independence, with Chi squared/N indicating the proportion of variance accounted for. Post hoc analysis used adjusted residuals (Beasley & Schumacker, 1995) which were converted to *p* values using the Significance-SigChi square function in SPSS 20. A Bonferroni correction was applied to the post hoc analyses. The proportion of respondents having heard of CLI differed significantly by age group ( $\chi^2(10, N = 1492) = 29.715, p < .001$ ). Age group accounted for 19.9 % of the variance in responses. Post hoc analyses indicated that the only age group whose rate of *yes* responses was significantly different (lower) than expected was the youngest group. The proportion of respondents having heard of CLI was also related significantly to income level ( $\chi^2(4, N = 1462) = 14.891, p = .005$ ) and educational level ( $\chi^2(6, N = 1491) = 52.485, p < .001$ ). Income level accounted for 10.2 % of the variance, and education level accounted for 35.2 %. Post hoc tests showed that for income, the relationship was explained by an unexpectedly low level of *yes* responses in the lowest income group only. For education level, the two lowest education level groups contributed a significantly low rate of *yes* responses whereas the highest education group contributed a significantly high rate of *yes* responses. Finally, female respondents were significantly more likely than male respondents to have heard of CLI:  $\chi^2(6, N = 1488) = 33.571, p < .001$ ; being the parent of a child 18 years or younger was marginally significantly related to having heard of CLI:  $\chi^2(4, N = 1491) = 9.579, p = .048$ , whereas routinely speaking more than one language was not related to having heard of CLI ( $p = .580$ ). An additional background variable not reported on in Table 3 because it was asked only of a subsample of participants was that of whether they personally knew someone with CLI. This question was asked only of those who had already responded *yes* to having heard of CLI. Of those reporting to have heard of CLI, 54.6 % said they personally knew someone with CLI, 35.8 % said they did not and 9.2 % said they did not know. Among those who had heard of CLI, a significantly greater number knew someone with CLI than did not know someone ( $\chi^2(6, N = 943) = 665.134, p < .001$ ). The breakdown of demographic variables of *yes* responders may differ across countries. Those potential differences are beyond the scope of this article, however, may be addressed in publications focusing on the data from individual countries or groups of countries.

### 3.2. Awareness and perception of the nature and causes of CLI across countries

Fig. 3 displays the percentage of respondents in each country who responded *yes* to having heard the term CLI. As is evident from the Figure, awareness levels vary widely across countries from a low of 13 % to over 90 %. In order to gain some perspective as to whether the overall awareness level has an impact on how people conceptualize the nature of CLI, awareness level groups were formed from visual inspection of the data: the lowest awareness group comprises countries with fewer than 35 % of respondents reporting

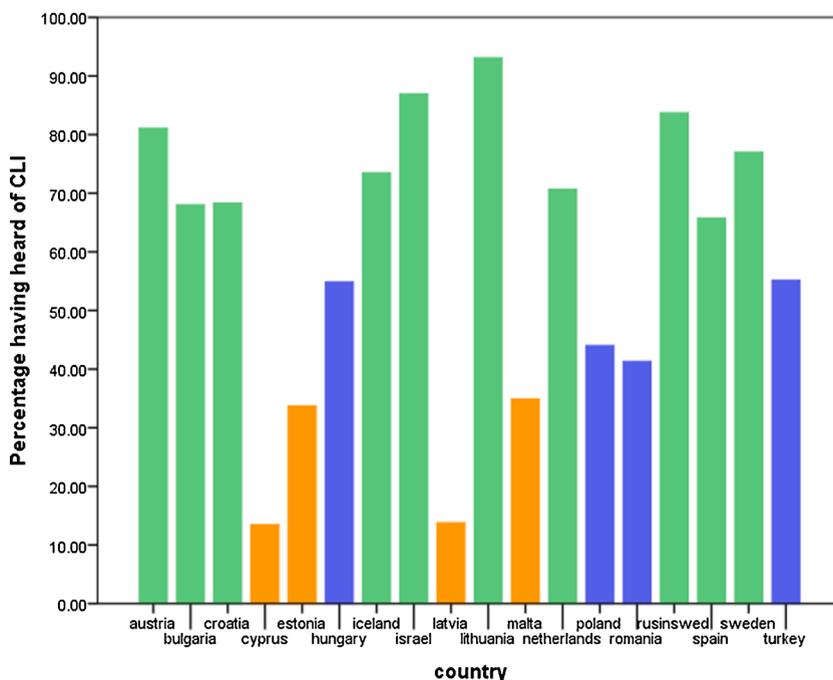


Fig. 3. Percentage of people reporting having heard of CLI in each of the participating countries. Awareness groups are color coded as: low awareness level of CLI in orange, middle awareness level of CLI in blue and high awareness of CLI in green (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article).

having heard of CLI. This group includes Malta, Latvia, Estonia and Cyprus (orange bars in Fig. 3). The second awareness group comprises countries with yes response rates of 40–55%, including Hungary, Turkey, Poland, and Romania (blue bars in Fig. 3). The remaining countries are considered to have relatively high public awareness of CLI (above the mean level), or 65 % and above (green bars in Fig. 3). Inspection of Fig. 3 reveals that relatively low levels of public awareness of CLI tend to be found in Eastern Europe; however this is not uniform, given the very high rates found in Lithuania, and relatively high rates in Bulgaria and Croatia as well.

To examine the public's views on what characterizes CLI, question 15 in Part B) of the questionnaire presented a series of statements about CLI and asked participants: "Please choose all that apply: A child with *childhood language impairment* is likely to have problems with the following:". Respondents who answered *no* to having heard of CLI were instructed to skip this question. Therefore, this analysis focused on the subset of participants who had heard of CLI. Results of this analysis are shown in Fig. 4 and Table 4— the latter also lists the response options (see also questionnaire in the Supplementary Material). As can be seen in Fig. 4, all responses were chosen by some respondents, but varied substantially in how many people chose them. In order to gain a better understanding of the relative likelihood that each option was chosen and how this might be affected by the overall awareness of CLI within each country, the mean ratings of each question item were rank ordered, first for the group as a whole, and second for each of the three awareness of CLI groups (color-coded in Fig. 3). The reasoning behind this was to explore whether the ideas that people have about what might characterize CLI are influenced by the level of awareness of CLI within the country in which they live. This could be hypothesized to happen because within countries where awareness is relatively high, there might be more information readily available to the public, not only on the existence of CLI, but also on its characteristics and its effects on communicative ability in everyday life and on the ability to function in educational and social settings. Because countries with high awareness of CLI have overall higher percentages of people answering this question, the absolute numbers of responses vary considerably between the awareness groups. Rank ordering the items addresses the relative number of people within each group that chose each answer, regardless of the differences in absolute numbers. The rank orderings for items on the manifestation of CLI are displayed in Table 4. Inspection of the Table reveals that the rank orders of items are strikingly similar for the sample as a whole and for the high and middle awareness groups. The highest ranked items by the group as a whole include having problems with pronouncing words or making speech sounds, being late at saying first words, followed by putting ideas into words, choosing the correct grammatical forms, making well-formed sentences, being teased or bullied and having low self-esteem. Low ranked items were consistently getting invites to parties, getting a job in the future, being able to learn two languages, following instructions, social skills and mathematics. Middle items included telling stories, putting ideas into sentences, reading, writing and learning in preschool or school. In contrast to the rank orderings just discussed, those of the lowest awareness group differed markedly on several items. This is the only group whose highest ranked item was clearly related to language rather than speech: having been late at saying first words. Pronunciation and forming speech sounds was ranked only number 6, as opposed to

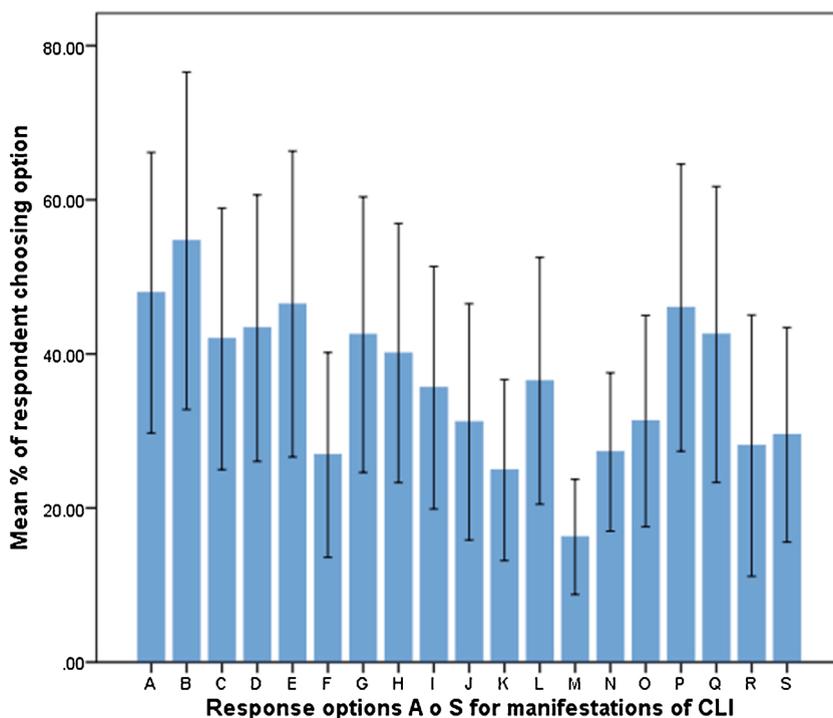


Fig. 4. The Figure represents the mean percentage across countries of those people in the entire sample reporting having heard of CLI, who ticked the various response options in Question 15, listing things that a child with CLI would be expected to have problems with (people who reported not having heard of CLI were instructed to skip this question). Specific response options labeled A to S in the Figure are listed in Table 4. Error bars represent 1 SD.

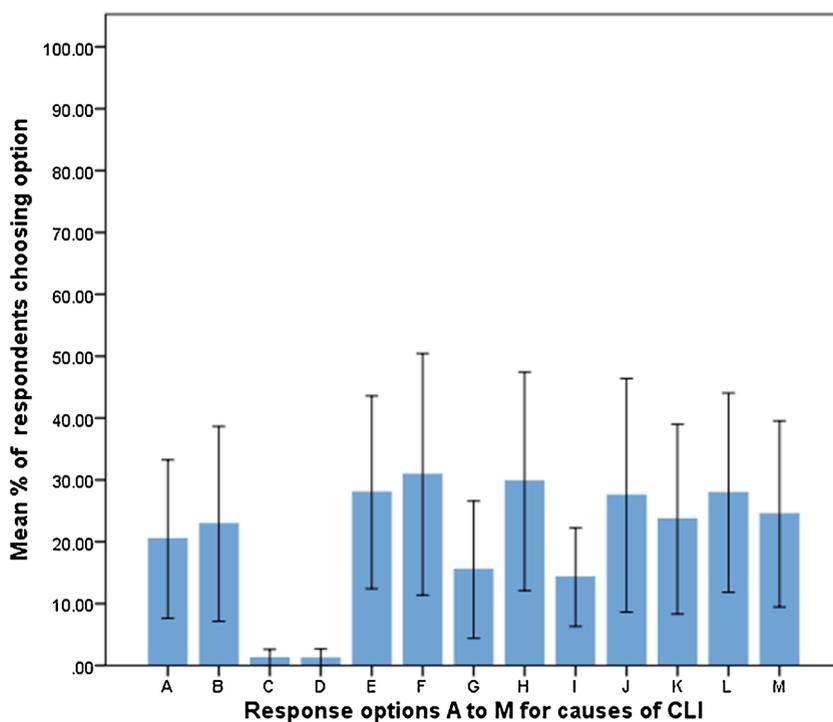
**Table 4**

Rank order of response options A to S (see also Fig. 4) addressing the characteristics of CLI in terms of things a child with CLI is likely to have problems with, by entire sample of participants (All), and by CLI awareness groups (Group 1: high awareness, Group 2: middle level awareness, Group 3: low awareness).

		All	Gr 1	Gr 2	Gr 3
A	Having been late at saying first words	2	2	2	1
B	Pronouncing words or making speech sounds	1	1	1	6
C	Putting ideas into sentences	8	8	4	5
D	Choosing the correct grammatical forms (i.e. inflections, word endings) of words	5	6	5	8
E	Making well formed sentences	3	3	3	7
F	Understanding instructions	17	15	17	18
G	Telling stories	6	7	7	2
H	Reading	9	9	6	11
I	Writing	11	10	12	9
J	Learning more than one language	12	12	10	12
K	Making or understanding jokes	18	17	18	17
L	Learning things in preschool or school	10	18	9	14
M	Math	19	19	19	19
N	Making friends	15	16	16	10
O	Social skills	13	11	13	13
P	Being teased or made fun of, bullied by peers	4	4	8	4
Q	Self-esteem	7	5	11	3
R	Getting invites to friends' parties, social activities	16	14	15	16
S	Getting a job in the future	14	13	14	15

number one by all the other groups. Other items that were ranked higher by the lowest awareness group compared to the other groups included telling stories, which was ranked second by this group compared to 6–7, self-esteem, which was ranked third as compared to 5–11 and making friends, ranked 10 compared to 15–16. Items that were ranked lower by this group than the middle and high awareness groups included making well-formed sentences, with a rank of 7 compared to 3 and learning in preschool or school, which was ranked substantially lower by this group than the other groups.

Question 16 of the questionnaire inquired about possible causes of CLI, asking participants: “Why do you think childhood language impairment happens? Choose all that apply”. The results of this analysis are displayed in Fig. 5 and Table 5 which also lists the 13 response options presented in the survey (see also questionnaire in the Supplementary Material). Fig. 5 displays the mean percentage



**Fig. 5.** The Figure represents the mean percentage across countries of those people in the entire sample reporting having heard of CLI, who ticked the various response options in Question 16, listing possible causes of CLI (people who reported not having heard of CLI were instructed to skip this question). Specific response options labeled A to M in the Figure are listed in Table 5. Error bars represent 1 SD.

across countries of people who selected each response option – recall that only those people who responded yes to having heard of CLI were asked to answer this question. Overall, the different choices varied in how many people selected them. The most frequently selected choices were: it has a psychological origin, it has an organic, medical origin, it results from brain damage, and it results from mental health problems such as depression, anxiety or emotional problems. These were followed in popularity by: it results from behavior problems, it happens because of intellectual disability, it is inherited from family, it is acquired through faulty learning/mislearning, and it results from environmental factors such as poverty or inadequate nutrition. CLI being associated with dyslexia or autism were frequently chosen as well, ranking number 7 and 3 respectively. The two remaining choices were by far least frequently chosen: it happens because children who have it are being punished by fate or God, and it happens because of spirits and demons. As mentioned in the introduction, whether to include these items was debated within the working group, as many saw these as potentially discriminatory or offensive items, or items that could put ideas into people's heads about obsolete ways of thinking about the causes of CLI and other developmental disorders. Others pointed out that cultural differences in views, if they are found, are real and as such should be documented. It is important to point out that although these two items were clearly the least frequently chosen, they generated non-negligible response rates: *Punishment from fate or God* was selected by 3.2 % of all respondent who said they had heard of CLI, and by 1.6 %, 5.9 % and 4.5 % of respondents in awareness groups 1, 2 and 3 respectively. *It happens because of spirits and demons* was selected by 3.6 % of all respondents, and by 1.2 %, 6.2 % and 7.2 % of respondents in awareness groups 1, 2 and 3 respectively. Moreover, responses of this kind came from many countries: *Yes* responses were found in Austria, Bulgaria, Croatia, Latvia, Lithuania, Malta, Poland, Romania, Sweden and Turkey. *I don't know* responses to these questions were found, in addition, in Spain and Russian-speakers sampled from Sweden. Similar to question 15 on the characteristics of CLI, the possible causes of CLI were analysed in terms of their rank ordering among the awareness groups. The result is presented in Table 5. Overall, the various CLI awareness groups are remarkably similar in how they rank order the possible causes offered. Exceptions involve the lowest awareness group who gave a higher rank than the other groups to CLI being inherited from family (4 versus 8–9), and a lower rank than the other groups to brain damage (5 versus 2–3) and mental health problems (9 versus 2–5) as being the origin.

### 3.3. Where the public has heard about CLI and autism

Fig. 6 shows the percentage of those who say they have heard of autism and CLI respectively who say they have heard of each of these 1) through the media including internet, 2) through reading materials such as magazines, pamphlets or brochures, 3) through a friend, relative or neighbor (word of mouth), 4) through their child's school, 5) through a medical or educational professional, or 6) from other sources. The Figure reveals that the sources are remarkably similar for both autism and CLI: the greatest source of information on both is media, followed by reading materials and word of mouth. Another fairly frequent source of information for both is from a medical or educational professional. The two sources with the fewest responses are the child's school and other. The main difference between the responses for autism and CLI is the percentage of people who say they have heard of autism in the media: 76.1 % had heard of autism in the media, whereas only 54.1 % had heard of CLI in the media.

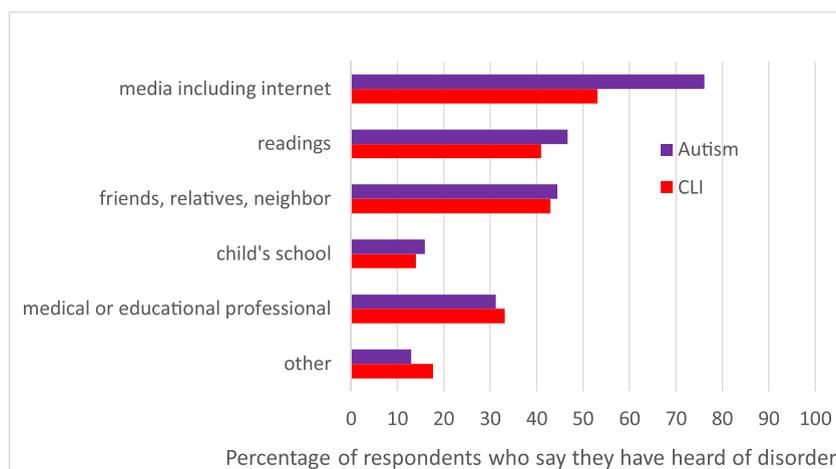
## 4. Discussion

This study set out to examine public awareness of childhood language impairment, providing a snapshot of public awareness of this construct just before awareness campaigns promoting a change to the term DLD are in full swing. Notable strengths of this study include a questionnaire constructed by an international team of researchers ensuring that cultural and linguistic differences were considered even in the conception of the questionnaire, as well as a large pool of respondents from over half of the countries of Europe. The study adds a dimension of diversity not found in recent international studies on DLD conducted within English-speaking countries only (Bishop et al., 2016, 2017). The questionnaire asked whether participants had heard of CLI, using, in each country, the term deemed most likely to be recognized by the public, and included sections with response options regarding the manifestation and causes of CLI. Further questions allowed comparison of awareness of CLI with that of four other developmental disorders: autism, dyslexia,

**Table 5**

Rank order of response options A to M (see also Fig. 5) addressing the causes of CLI, by entire sample of participants (All), and by CLI awareness groups (Group 1: high awareness, Group 2: middle level awareness, Group 3: low awareness).

		All	Gr 1	Gr 2	Gr 3
A	It is inherited from family	8	9	9	4
B	It happens because of intellectual disability	9	8	8	10
C	It happens because children who have it are being punished by fate or God	13	12	13	13
D	It happens because of spirits or demons	12	13	12	12
E	It has an organic medical origin	3	2	5	2
F	It has a psychological origin	1	3	1	1
G	It is acquired through faulty learning/ mislearning	11	10	10	11
H	It results from brain damage	2	1	3	5
I	It results from environmental factors, for example poverty, inadequate nutrition	10	11	11	8
J	It results from mental health problems, for example depression, anxiety, emotional problems	5	5	2	9
K	It results from behaviour problems, attention deficit or hyperactivity	7	7	6	7
L	It results from autism	4	4	4	3
M	It results from dyslexia	6	6	7	6



**Fig. 6.** Percentage of those respondents who say they have heard of autism and CLI respectively who said they heard of each of these in the media, through readings, through word of mouth, through their child's school, through a medical or educational professional or from another source.

ADD/ADHD and speech disorder and of where the public had heard of each disorder. The comparison of awareness across disorders is among the most striking findings of the study. The results clearly show that public awareness of CLI across countries of Europe is, on the average, only around 60 % (but ranging as widely as 13–93%) in stark contrast to the awareness of autism, which is consistently around and above 90 %, with a small standard deviation. Awareness of CLI was found to be influenced significantly by a number of background variables, the strongest of which was educational level, accounting for 35 % of the variance, followed by age group and income level (accounting for close to 20 % and 10.2 % of the variance, respectively). The manifestations and causes of CLI chosen most frequently by the public were similar across countries with overall high and medium high overall awareness of CLI; however differed in countries with the lowest awareness levels. The public had heard of CLI in largely the same places they had heard of autism. Each of these aspects of the findings is discussed in more detail in the following sections.

There has been much discussion of the need to increase public awareness of DLD (Bishop, 2017; Kamhi, 2004; Norbury & Sonuga-Barke, 2017); however, to our knowledge, this is the first study to document such public awareness directly. The results of the study confirm that public awareness of language impairment in childhood is much lower than that of autism, dyslexia, ADD/ADHD and speech disorder. The difference in awareness of autism and CLI in the overall sample is significant and large (Cohen's  $d$  of 1.86), and a large difference between awareness of the two is found across all participating countries (with Lithuania being the one exception). Clearly, there is a pressing need for measures to increase public awareness of CLI (DLD). Following the RADLD awareness campaign (<https://radld.org/>), and CATALISE study (Bishop et al., 2017), many of the countries that participated in this study have adopted or are in the process of adopting a direct translation equivalent of the term DLD (<https://radld.org/dld-awareness-day/>) and more countries may join in that effort or initiate efforts of their own. The present study documents public awareness of language impairment in childhood in the participating countries *before* these concerted international efforts were in full force. It will be of much interest to repeat a study of this type in the near future to assess the efficacy of these campaigns.

The greater awareness among more educated and more affluent participants may be somewhat surprising in that CLI (DLD) is reported to be more prevalent among segments of the population with lower education, with low maternal education constituting a risk factor for DLD, at least in studies conducted within English-speaking countries (Bishop et al., 2017; Rudolph, 2017). This suggests that information on CLI is being presented to the public through channels that are more accessible to more highly educated people rather than being directed in efficient ways at those most at risk. Accordingly, being the parent of a child under the age of 18 years had only a small effect on whether people had heard of CLI, suggesting again that information on CLI is not being directed specifically to or is not reaching parents of young children. Female respondents were more likely to have heard of CLI than male respondents, which may reflect a greater role of women in childrearing. Being bilingual might have been hypothesized to contribute to awareness because it might make people more aware of language difficulty or because it might make people more capable and more likely to read information beyond that presented in the main language of their country. However, being a routine user of more than one language did not have an impact on whether people had heard of CLI.

As predicted, differences in awareness levels of CLI were found across countries. Overall, the findings suggest that relatively lower levels of awareness are found in countries of Eastern Europe, and the highest levels in North-Western Europe; however, this was not clear cut as awareness levels were high in Lithuania, Bulgaria, Croatia and in Russian speakers surveyed by the Swedish team. There could be many reasons behind differences in awareness across countries or regions. The profession of logopedics/speech language therapy (SLT) – the terms most widely used in Europe – has followed diverse histories and traditions, including some marked differences between eastern and western parts of Europe (Padrik, Hallap, & Vihman, 2019). Education programs in logopedics/SLT in Europe have been undergoing major changes in recent years in line with the Bologna process, which aims to streamline higher education within Europe and promote mutual recognition of training across countries (European Commission, 2020). This has meant that professional programs gradually move to the university level. With this change also comes a gradual increase in the profession's

visibility and level of respect in professional and public arenas, as well as in its ability to directly contribute to research, to influence policy on communication disorders, and to introduce viewpoints from the field that differ from a strictly medical model of developmental disorders (see Topbaş et al., 2019). Results of a large practitioner survey conducted by COST Action IS1406 do suggest that changes in educational programs in logopedics/SLT, including the recent appearance of Ph.D. programs within the field, have led to more emphasis on consideration of theory in service delivery decisions. The study showed that professionals involved in language impairment services for children are currently of varying educational levels, from pre-university to the Ph.D. level, but still include a greater number of people with non-university than university degrees. Practitioners were also educated in a variety of disciplines. Among them, non-SLTs had greater knowledge of language development theories than did SLTs (Saldaña & Murphy, 2019).

Other factors that may contribute to, or be interrelated with, differences in public awareness, include the types of services that are offered and how accessible they are to the public. The practitioner survey mentioned in the previous section addressed both of these issues. Cross-country differences were documented in eligibility for services based on severity level of the disorder, how children were identified for services (ranging from rigorous surveillance programs to less clear identification pathways), in the way in which services are funded (through taxation, medical insurance, charitable foundations or privately by families), and in the dosage of treatment offered (McKean, Gerrits, Tulip, & Tolonen, 2019). Further, differences were shown across countries in terms of whether access to services is impacted by demographic factors such as urban or rural residence, education and income level as well as bilingualism (Elin Thordardottir & Topbaş, 2019). Roulstone and Harding (2013) have pointed out as well that concepts of *non-engagement* of the public in potential need for services and of members of the public being *hard to reach* can depend on more complex factors beyond awareness and access as defined by health or educational systems. The survey used in this study had questions not reported on here addressing public knowledge on where to turn for assessment of a potential language impairment in their child as well as for services. These results will be presented in a separate publication due to their complexity.

Linguistic differences are another factor that impact public awareness. In the practitioner survey conducted by the COST Action (Law, Tulip, & Beckermann, 2019), despite much attention to this aspect, translation issues were suspected to have impacted the respondent's ability to respond to some of the questions (Saldaña & Murphy, 2019). In the present study, rather than using back translation, which did not prove particularly effective in the practitioner survey, translation and wording issues were addressed by careful and detailed discussion among group members following administration of a pilot version of the survey. The potential impact of linguistic issues on public awareness and understanding of clinical terminology should not be underestimated. For scientific publications to reach audiences beyond a researcher's country, they must be written in English. Even though knowledge of English as a second language is widespread and increasing, the level of English mastery varies greatly even among educated people in non-English speaking countries (Arnbjörnsdóttir & Ingvarsdóttir, 2018). Similar factors are likely to influence the public in their internet searches. Only half of the respondents in this study reported using more than one language routinely. Successful awareness campaigns will need to provide detailed materials in the language of the public they target, and at the same time help the public make the link to key terms in English, given the reality that internet resources are more abundant in English than in any other language. Direct translation equivalents of the term DLD have the advantage of consistency in terminology across languages. Such consistency is only achieved, however, if public audiences across countries are able to equate their version of the term with the English term DLD, such as in their internet searches. This benefit may need to be weighed against the danger that direct translations may become stilted and unattractive to the public, and may give rise to a different understanding of the nature of the disorder.

Merely having heard a term does not guarantee a deep understanding of the term. Importantly, this is not restricted to CLI (DLD) but may very well be the case for autism, which is a complex disorder involving a spectrum of manifestations. Results of this study suggest that among those who said they were aware of CLI, most people surveyed were aware only of some of its impacts. Responses on the characteristics of language impairment indicated that many respondents did not clearly distinguish language disorder from speech disorder as pronunciation was the manifestation selected the most frequently. Following this, characteristics selected most often overall involved functions that do not require specialized knowledge to associate with language, such as being late at saying first words, making well-formed sentences and telling stories. More sophisticated language skills were much less likely to be selected, including understanding jokes, understanding instructions, and social skills. Putting ideas into sentences was selected much less frequently than making wellformed sentences, indicating the public's greater focus on the formal aspects of producing correct language structures rather than the association of language and thought. Broader implications of language impairment on academic and life skills were selected the least frequently, including difficulty in math, getting a good job, making friends and getting invites to parties. In this respect, it is of much interest that impacts on self-esteem were selected relatively often, indicating that the public views good language or speaking skills as important determiners of how a person feels about themselves and how they are perceived by others. Further, although overall awareness rates of CLI and autism were significant and large, analysis of potential causes of CLI indicated that the respondents did not clearly differentiate CLI from autism or dyslexia. The causes chosen most frequently were ones that reflect an inherent breakdown within the person, including a psychological origin or brain damage. Causes involving a relationship to other disorders were also relatively common, including in addition to autism and dyslexia, behavior problems, attention deficit, and depression. The causes selected least frequently were ones focusing on the environment or general learning, such as poverty, poor nutrition, faulty learning or mislearning again indicating that CLI as seen as reflecting a breakdown intrinsic to the individual. It was of note also that although causative factors involving spirits and demons, fate and punishment by God were low, they were found at non-negligible rates and across several countries. More detailed analyses of results for individual countries or areas may contribute to a more refined understanding of the public's ideas and how they are formed. Public ideas on the manifestations and causes of DLD are important not only in terms of the public's ability to recognize the signs of DLD, but also in forming their ideas of what can be done about it and what role they might be able to play in it. Questions on these aspects included in the questionnaire will be reported on separately.

Finally, in addition to strongly supporting the need for continued efforts to raise awareness of CLI/DLD, this study provides some indication of factors that might influence the success of such campaigns. One way to approach the question of how best to reach public audiences is to examine how over 90 % of the public in all the countries surveyed became aware of autism. The answer suggested by this study turns out to be that the public has heard of CLI and autism largely from the same sources; therefore, the difference is not in *where* but in *how much*. Greater coverage of DLD in media and internet appears most likely to be successful; other venues such as healthcare and schools also appear to have been underutilized. Knowing someone with language impairment personally was an important source of information, suggesting that empowering parents and other caregivers to educate people in their surroundings may be an important mechanism to support. Awareness was greater among people with more formal education, suggesting that efforts should continue to target this group as it may be the most receptive. At the same time, more efficient ways to reach groups with less formal education are clearly needed as this group is relatively uninformed but at higher risk for CLI. Kamhi (2004) reported that the public is more likely to retain clinical labels that refer to a condition they did not know previously. The results of this study offer some support for this in that respondents in countries where awareness of CLI is low adopted a more literal interpretation of CLI concluding that its manifestations would be in domains of language rather than pronunciation, a response option more often chosen by those overall more aware. This suggests a certain opportunity for awareness raising in those countries where awareness is currently low, as it involves the presentation of a new concept as opposed to the possibly harder task of modifying already formed ideas.

#### 4.1. Conclusion

In conclusion, this study strongly supports the need for efforts to increase awareness of children's language impairments, or DLD. Such efforts are already underway – this study can serve as a baseline against which to gauge the effectiveness of such efforts in Europe. Future studies will be required to document outcomes of awareness campaigns and to guide them in terms of the methods that are best suited for different parts of the world. Notable differences are seen even within countries of Europe. As awareness campaigns of DLD are taken to a broader world-wide context, greater differences will unavoidably be encountered and will require thoughtful approaches (McAllister et al., 2013; Roulstone & Harding, 2013; Wickenden, 2013; Wylie et al., 2013).

#### Author statement

This study is the product of a large collaborative effort, which took place within COST Action IS1406, a research network funded by COST (European Cooperation in Science and Technology, European Union). The contributions are outlined clearly in the manuscript. Working Group 3, under the direction of its chair and vice chair (the second and first author of this article) developed the questionnaire that was used, and the protocol of the study. All members of WG3 are mentioned in the acknowledgments. Also mentioned in the acknowledgments are those people who collected data across countries and the persons who developed the response keys and who combined the data from all the countries.

The two listed authors were the directors of WG3 and thus directed this study. They performed the analyses of the data and wrote the article.

#### Acknowledgements

This study was funded in part by European Cooperation in Science and Technology grant COST Action IS 1406. Working Group 3 of COST Action IS1406, developed the survey questionnaire used in this study:

Reili Argus, Veronika Bláhová, Talat Bulut, Bernard Camilleri, Ana Castro, Ewa Czaplewska, Ineta Dabašinskienė, Linda Daniela, Adinda Dulčić, Anna Esposito, Daniela Gheorghita, Elin Thordardottir, Helen Grech, Gisela Håkansson, Niloufar Jalali-Moghadam, Sviatlana Karpava, Eglė Krivickaitė-Leišienė, Marja Laasonen, James Law, Rena Lyons, Rama Novogrodsky, Fátima Pereira, Sylvia Nieva Natasha Ringblom, Isabel de los Reyes Rodríguez Ortiz, Sini Smolander, Stavroula Stavarakaki, Anna Kaisa Tolonen, Seyhun Topbaş, Ioannis Vogindroukas, Krisztina Zajdó, Georgeta Zegan

The following contributed data to this study: Roksana Bachmura, Talat Bulut, Ewa Czaplewska, Linda Daniela, Melanie Dornstauder, Elin Thordardottir, Helen Grech, Gisela Håkansson, Maria Kambanaros, Brigitta Keij, Nurcan Kement, Inge Klatte, Eglė Krivickaitė-Leišienė, Jelena Kuvač Kraljević, Andra Kütt, Vilma Makausikiniene, Ana Matic, Silvia Nieva, Rama Novogrodsky, Natasha Ringblom, Isabel de los Reyes Rodriguez Ortiz, Katarzyna Skubala, Margarita Stankova, Elena Theodorou, Krisztina Zajdó, Seyhun Topbaş, Georgeta Zegan.

Thanks are extended to Ludvine Plez for developing the response files and response keys and to Jalisa Gittens for her work on compiling the international database.

#### Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.jcomdis.2020.106057>.

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