

# DEVELOPMENTAL LANGUAGE DISORDER AND ASSOCIATED MISCONCEPTIONS: A MULTI-COUNTRY PERSPECTIVE

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**Abstract:** *Although developmental language disorder (DLD) is one of the most common neurodevelopmental disorders, it is often burdened by misconceptions since the general public are unaware of the features of this disorder. Insufficient levels of public awareness and knowledge about DLD highlight the need to adopt appropriate public awareness activities. The aim of this study was to investigate the potential misconceptions associated with the aetiology and recovery of people with DLD in three neighbouring countries - Croatia, Italy, and Slovenia. Additionally, we explored effective ways to promote the spread of accurate information among the public in order to minimise or eliminate false ideas about DLD. To address these specific aims, a public survey was conducted. It was completed by 287 respondents (ages 18 to 60+) with different educational backgrounds (primary and secondary or higher). The results show that the general public in all three countries are misinformed about DLD and hold strong opinions that it is a temporary condition that occurs in childhood, probably as a result of other developmental conditions, and that it will pass either spontaneously or with hard work and proper education. Moreover, the optimal way to increase awareness about DLD was dependent on the age and level of education of the person. Therefore, promoters (ideally researchers and clinicians) must apply specific activities when they target specific groups of people, or use different forms of dissemination activities to reach the broader public, regardless of age and education. The findings reveal a significant lack of knowledge about DLD among the general public and highlight the need for continued awareness campaigns that can target specific groups of people.*

**Keywords:** *developmental language disorder; misconception; awareness; survey; multi-country perspective*

## INTRODUCTION

A misconception is defined as a false idea or belief that is based on a failure to understand a situation (Cambridge Advanced Learners Dictionary and Thesaurus, 2015; Webster, 2010). This term is used to describe knowledge and beliefs that are incongruent with core concepts and empirical findings (Hughes, Lyddy and Lambe, 2013; Taylor and Kowalski, 2004). Such false ideas may be based on incomplete, entirely wrong, or no facts at all. Myths, misconceptions, and half-truths exist in many areas of our daily functioning and can be more or less harmful depending on the negative

impact they have on other members of society. This is the case with misconceptions about people with various forms of disabilities; misconceptions can indirectly reduce their social inclusion or access to services, as well as increase marginalization (EU Social Charter, 2016; UN Convention on the Rights of Persons with Disabilities, 2006).

The UN Convention on the Rights of Persons with Disabilities (2016) recognizes the hazards of misconceptions and stereotypes, and emphasises the need to take effective and prompt measures to overcome them. Stereotypes can take many forms, but they should be recognized, reduced, and final-

ly, completely abandoned. The UN Convention establishes a direct link between raising public awareness and combating stereotypes, prejudice, and harmful practices in all areas of life. Concrete measures to do so are: initiating and maintaining effective public awareness campaigns, promoting different levels of education and other systems, encouraging the media to portray people with disabilities in a credible manner, and promoting appropriate awareness programmes.

Public awareness about any disorder, including developmental or acquired language disorders, is critical for expanding services, providing research, as well as ensuring support and social inclusion (Code et al., 2016). Awareness can be increased through specific activities, such as education campaigns, promotion activities, and fact sheets on websites, billboards, and posters, face-to-face discussions and surveys in communities, as well as via TV and radio broadcasts, YouTube channels, newspapers, or any other publicly available medium (Bishop, Clark, Conti-Ramsden, Norbury and Snowling, 2012; Code et al., 2016; Devilbiss and Lee, 2014). Media, written material, and word-of-mouth campaigns are powerful sources of information because they can reach various audiences across different circumstances. YouTube streaming and social networks also have extensive effects (Bishop et al., 2012). Information coming from medical or educational specialists is perceived as particularly credible (Thordardottir and Topbaş, 2021), so academics and professionals should be more present in the public sphere and promote an evidence-based approach to these important topics. However, despite many ways to communicate professional ideas in the public space, *one recipe does not fit all*. To ensure that the public can understand the information clearly, professionals need to adapt their topics and arguments to the target group, not only in terms of the medium and form of materials used, but also in terms of language and terminology (Thordardottir and Topbaş, 2021). The type of discourse and medium used during a public awareness campaign also depends on the nature of the disorder. Some disabilities are more visible, so the public are more likely to know more about them, while others are subtle and less known to the public, and therefore require a more specific approach.

The focus of this paper is public awareness and prevalent misconceptions related to DLD, a hidden condition whose characteristics are still relatively unknown to the public (Kuvač Kraljević, Matić, Roch, Kogovšek and Novšak Brce, under review; McGregor, 2020). This topic was examined in three neighbouring countries - Croatia, Italy, and Slovenia. These countries have influenced each other historically and geographically; they share cultural habits and customs, have similar educational policies, and commonalities in some aspects of clinical and research traditions with respect to language disorders. Since these countries share mutual influences and contact, we aim to explore whether the public also have similar attitudes about DLD.

### Prevalent misconceptions about DLD

Developmental language disorder (DLD) is a neurodevelopmental condition characterised by language skills that remain persistently below the expected level without any identifiable cause, such as low intelligence, neurological damage, hearing impairment or other (Conti-Ramsden and Botting, 2008; Bishop, Snowling, Thompson, Greenhalgh and the Catalise-2 Consortium, 2017). Despite its persistence throughout childhood and adulthood, timely recognition and intervention are often lacking. This can lead to an accumulation of negative consequences that manifest in social, mental, emotional, and academic aspects of the child's life (Conti-Ramsden and Botting, 2008; Snowling, Bishop, Stothard, Chipchase and Kaplan, 2006), as well as in his or her future employment prospects in adulthood (Law, Rush, Parsons and Schoon, 2009). Studies have shown that adolescents with DLD are shy, more dependent on others and have lower self-esteem (Wadman, Durkin and Conti-Ramsden, 2008), which is why parents are more concerned about their children failing to become independent members of the society than about language skills per se (Pratt, Botting and Conti-Ramsden, 2006).

The estimated prevalence of DLD is relatively high affecting about 5.8 million children under the age of 18 in Europe alone (COST Action IS1406). Due to the lack of physical or audibly perceptible manifestations, it is more complex to understand and recognize than other more visible conditions

(Bishop, 2010; Kamhi, 2004; McGregor, 2020; McGregor, Goffman, Van Horne, Hogan and Finestack, 2020).

The terminology of this disorder has also varied substantially over the past several decades (i.e., specific language impairment, primary language impairment), and a consensus was established amongst researchers on the term DLD only recently (see Bishop et al., 2017). The cause(s) of DLD also remain unknown, but several theoretical reports have attempted to explain the aetiology and relate it to the profiles of these children. Some of these approaches are grounded in hypotheses of minimal neurological and structural deficits (i.e., cerebral asymmetry or minimal brain dysfunction; Plante, Swisher, Vance and Rapcsak, 1991), while others focus more on genetics (i.e., linking its heritable nature to the *FOXP2* gene; Bishop, North and Donlan, 1995; Dale et al., 1997). The two largest groups of theoretical accounts focus on cognitive and linguistic deficits. The former argue that DLD is caused by processing deficits that affect language development (e.g., Kail, 1994; Leonard, 1998; Montgomery, 2004), while the latter claim that DLD is caused by deficits in linguistic representation (e.g., Clahsen, Bartke and Goellner, 1997; Rice and Wexler, 1996; van der Lely, 1998).

The complex nature, multifactorial aetiology, associated comorbidities, and lack of appropriate diagnostic tools may be the reason why DLD is prone to misunderstandings and false beliefs. Since discrepancies regarding terminology, assessment, and legislative aspects exist within the research community (Bishop, Snowling, Thompson, Greenhalgh and the Catalise Consortium, 2016; Bishop et al., 2017), one can only imagine the level of uncertainty within the general public.

Some of the typical myths regarding DLD are found throughout the world, and some are more culture-specific. Examples of common stereotypes are that children will grow out of their language problems and *catch up* with their peers (a so-called *wait and see* approach), that their level of intelligence is lower than that of other children, that DLD is caused by poor parenting or bilingualism, or that it is strictly restricted to childhood (McGregor, 2019). Another obvious problem, even among people who claim to have heard of this condition,

is the lack of clear understanding of what this disorder of language actually implies. The public very often confuses language disorders for speech-related problems, and in some cases even for dyslexia or autism spectrum disorder (ASD) (Kamhi, 2004; Kuvač Kraljević et al., under review; Thordardottir and Topbaş, 2021).

Topbaş (2006), Mostafa and Ahmed (2018), Thordardottir and Topbaş (2019, 2021) have outlined some rather extreme misconceptions and misbeliefs related to language disorders and service provision in northern Egypt, Turkey, and parts of Europe, and linked them to local cultural and religious beliefs. Examples of these striking misconceptions are that there is a cure for DLD, and that praying (Topbaş, 2006) or eating a crow's tongue can help children speak (Mostafa and Ahmed, 2018). Importantly, misconceptions are not necessarily reserved for countries with an extreme lack of awareness of the scope of a speech-language pathologist's work, features of language development, or of DLD. Findings from Egypt indicate relatively moderate to high levels of awareness among professionals and the general public, yet some people still base their beliefs on religious and cultural customs and superstitions that lack evidence-based data (Mostafa, 2017). Statements like these may sound bizarre from a Euro-centric point of view, but other less extreme misconceptions - that DLD can be prevented (Kuvač Kraljević et al., under review) or that it is acquired through improper learning, poverty or inadequate nutrition (Thordardottir and Topbaş, 2021) - can be equally problematic.

The prevailing collective opinion about child language development and delay, or the views on professionals responsible for providing services, can influence timely referral (Roulstone and Harding, 2013; Thordardottir and Topbaş, 2021). This should be taken as an urgent wake up call for professionals to continuously gather science-based evidence and share these findings with the public (McGregor et al., 2020). Studies on public awareness generally indicate that awareness about DLD is influenced by age, level of education, and income (as extensively elaborated in Kuvač Kraljević et al., under review and Thordardottir and Topbaş, 2021), but there are no studies on ideal ways to disseminate

nate evidence-based DLD findings to the general public. A recent study reported that people often hear about communication and language disorders from the media and different web-based sources (Thordardottir and Topbaş, 2021), but whether they prefer it and find it suitable is not entirely clear.

Based on the need to start addressing this topic, we aimed to obtain further data on country-specific levels of awareness about DLD, identify existing misconceptions, and recognize optimal ways to raise awareness in order to eliminate them.

## AIM AND RESEARCH QUESTIONS

This exploratory study aims to investigate and compare the prevalent misconceptions regarding DLD among people residing in Croatia, Italy, and Slovenia, as well as to investigate ideal ways to promote the spread of accurate information on DLD based on specific target groups (after taking age, gender, and level of education into account). To address these objectives, two specific questions were formulated:

1. Are there differences in the types of prevalent misconceptions regarding DLD across the three countries, especially in terms of perceived causes and possibilities of recovery?
2. Are there differences in the preferred ways of dissemination of DLD-related information in relation to the demographic characteristics of respondents from the three countries?

Due to the similarities described earlier, we did not expect to find significant differences between

the countries regarding prevalent misconceptions. However, we expected to observe differences in the preferred ways of dissemination of DLD-related information in relation to the demographic characteristics of our respondents.

## METHODS

### Participants

For the purpose of this study, we recruited a similar number of respondents from three neighbouring countries: Croatia ( $N = 92$ ), Italy ( $N = 105$ ), and Slovenia ( $N = 90$ ). Participants were recruited by principal investigators from each country and stratified according to gender, age, and level of education. The respondents had no formal knowledge about DLD or SLPs, nor were they SLPs themselves. Details on their demographic characteristics are presented in Table 1.

### Materials

For the purpose of this study, we used a public survey (Thordardottir and Topbaş, 2021) developed within the COST Action IS1406. The survey is intended for wider audiences and its main purpose is to investigate public awareness of DLD across Europe. Therefore, it has been translated into many European languages, including Croatian, Italian, and Slovenian. The survey is divided into five segments, each addressing different topics: 1) demographic characteristics of respondents (q. 1-10); 2) their knowledge about various aspects of DLD (q. 11-19); 3) features of interventions for people

**Table 1.** Demographic characteristics of respondents.

Demographic characteristics	Country			Total
	Croatia	Italy	Slovenia	
Participants (N)	92	105	90	287
<b>Age range (in yrs)</b>				
Younger adults (18-39)	31	49	30	110
Middle-aged adults (40-59)	31	29	30	90
Older adults (60 +)	30	27	30	87
<b>Gender</b>				
Male	42	46	32	120
Female	50	59	58	167
<b>Level of education</b>				
Primary and secondary (8-12 yrs of education)	46	52	63	161
Higher (> 12 yrs of education; Bacc., MA, or PhD level)	46	53	27	126

with DLD (q. 20-23); 4) opinions about the role of parents (q. 24-27); and 5) preferred dissemination activities intended to increase public awareness (q. 28-30). There are several types of questions: open-ended, closed, dichotomous, multiple, and comment-type questions.

To address our specific study objectives, seven questions were analysed - questions on demographic characteristics (q. 1, 2, 3, 5), misconceptions related to causes of DLD and possibilities of recovery (q. 16, 17), and on the preferred ways of disseminating information (q. 28). The last three questions were the main focus of this study since they investigate the misconceptions (causal and recovery aspects) of the public and the preferred ways of disseminating information (see Appendix). These three questions were all multiple-choice questions that contained statements to which respondents could answer *yes / no / do not know*. Only affirmative responses were included in the analysis.

### Procedure and analyses

Prior to data collection, ethics approval was obtained at the McGill University (IRB: Study A10-B63-17A, January 2018) by the head of the COST Action's Working Group 3. For this particular study, the survey was distributed within each country by one or two students from three universities (University of Zagreb, University of Padua, and University of Ljubljana). The survey was completed using a paper-pencil format, with each participant responding individually to the questions at home or in a pre-arranged public location. Prior to receiving the survey, each participant gave his or her formal written consent. The average time taken to fill out the survey was 15 minutes. All answers were collected and translated into English before being coded in a shared spreadsheet using the same sets of codes (e.g., 1, 2, 3 corresponded to *yes / no / do not know* for the multiple-choice responses). To ensure anonymity, the sheets were shared only by the investigators responsible for data collection. Statistical analyses, including *t*-tests for proportions and analysis of variance, where appropriate, were performed using SPSS 23.0 (IBM Corp, 2015). A Bonferroni correction was applied for multiple comparisons, and significance was reported at a 1% level.

## RESULTS AND DISCUSSION

### Misconceptions about the causes of and recovery from DLD

As a part of our first aim, we decided to investigate how the public perceives possible causes of DLD and the existing misconceptions regarding possibilities of recovery from this disorder. In order to conduct a useful investigation of these topics, it was important to exclude respondents who previously reported that they had not heard about DLD (question 11). According to this criterion, we analysed the responses of 65 people from Croatia, 87 from Italy, and 64 from Slovenia, since these individuals reported that they were acquainted with the term.

Question 16 from the survey included 13 statements related to the causes of DLD and 8 statements related to the possibilities of recovery. The former were grouped into four groups of possible causes (see also Table 2), as follows:

- (1) DLD has a genetic / organic / psychological / emotional origin (4 statements);
- (2) DLD originates from other disorders, such as intellectual disability / attention deficit hyperactivity disorder (ADHD) / ASD / dyslexia (4 statements);
- (3) DLD results from environmental factors, such as faulty learning / poverty / inadequate nutrition / brain injury (3 statements);
- (4) DLD is explained by various religious or cultural beliefs, such as that it is a punishment from God or that it happens because of spirits and demons (2 statements).

Affirmative responses to these groups of statements were observed and average scores calculated for each group were compared between the three countries (Table 2).

In order to investigate potential differences between the three countries, we conducted an analysis of variance for each group of statements. There was a significant difference with respect to the second group of causes ( $F(2, 213) = 18.29; p < 0.001$ ), i.e., for those that linked DLD to other neurodevelopmental disorders such as intellectual disabilities, ADHD, ASD, and/or dyslexia. Differences were observed between Croatia and each of the other countries

**Table 2.** Average number of affirmative responses within each group of statements associated with potential causes of DLD.

Possible causes of DLD (four groups)	Croatia (N = 65)			Italy (N = 87)			Slovenia (N = 64)		
	M	SD	SEM	M	SD	SEM	M	SD	SEM
(1) Caused by genetic, organic, emotional, and other factors	2.03	1.27	0.16	1.72	1.15	0.12	1.84	1.29	0.16
(2) Caused by other disorders	2.48	1.30	0.16	1.57	1.26	0.14	1.16	1.26	0.16
(3) Caused by environmental and acquired factors	1.02	0.84	0.10	0.92	0.93	0.10	0.84	0.74	0.09
(4) Caused by gods, demons, spirits, or faith	0.02	0.12	0.02	0.03	0.18	0.02	0.05	0.28	0.04

**Table 3.** Proportion of responses related to the possibility of recovery from DLD and comparisons between countries.

Statements (possibility of recovery)	Croatia (N = 65)	Italy (N = 87)	Slovenia (N = 64)	Cro/Ita	Cro/Slo	Ita/Slo
(1) Typically resolves itself spontaneously at preschool age	0.28	0.08	0.45	<b>t = 3.38</b> <b>h = 0.6</b>		<b>t = 5.05</b> <b>h = 0.9</b>
(2) Typically resolves itself spontaneously at school age	0.19	0.26	0.53		<b>t = 3.66</b> <b>h = 0.6</b>	
(3) Can be resolved with hard work	0.94	0.82	0.85			
(4) The child can overcome his/her problem on his/her own	0.18	0.01	0.10	<b>t = 3.35</b> <b>h = 0.7</b>		
(5) Can be resolved at a later age, as it did in other cases that I know of	0.45	0.26	0.30			
(6) Doctors typically recommend a “wait and see” approach	0.22	0.19	0.33			
(7) Can be resolved through education	0.50	0.88	0.52	<b>t = 5.67</b> <b>h = 0.9</b>		<b>t = 5.93</b> <b>h = 0.95</b>
(8) Will get worse with age	0.12	0.11	0.08			

Note: Significance is reported at the  $p < 0.01$  level; non-significant differences were omitted from the table;  $t$  = value of t-test for proportions;  $h$  = effect size value.

(post hoc Scheffe: Croatia vs Italy  $t = 4.30$ ; Croatia vs Slovenia  $t = 5.85$ ; both  $p < 0.001$ ), while no differences were observed between Italy and Slovenia. Respondents from Croatia were significantly more likely to believe that DLD stems from other conditions than respondents from the two neighbouring countries, which suggests that they are more prone to observing DLD as a part of other more visible clinical conditions. As seen from mean values listed in Table 2, Croatian respondents were followed by respondents from Italy and then from Slovenia. Respondents from all three countries believed to a similar extent (more or less) that genetic, organic, and other similar factors (group 1), as well as environmental factors (group 3) were possible causes of DLD.

Similar views about the possible causes of DLD were recently reported by Thordardottir and Topbaş (2021) in a large-scale study that included aggregated sets of public survey data from 18 European countries. The most frequently selected choices across all countries were that DLD has a psycho-

logical, organic, or medical origin and that it results from environmental and emotional problems. Despite the fact that religion- and culture-related causes (choices that attributed DLD to bad faith, punishment from God, demons, or spirits) were selected to a significantly lesser extent, response rates were far from trivial, i.e., summed percentages were 3 and 4%, respectively; these results are similar to the percentages found in the present study (see mean values for statements in group 4; Table 2).

To investigate the existing misconceptions regarding DLD more thoroughly, our intention was to analyse the opinions of respondents regarding the possibilities of recovery from this disorder. A collective approach of observing misconceptions about the causes and *the cure* for DLD could provide a more comprehensive indication of the most prevalent and potentially harmful beliefs.

Question 17 in the survey also required *yes / no / do not know* responses to several statements

related to recovery. In order to analyse and compare proportions between countries, only affirmative responses were considered. Since this analysis involved multiple comparisons, additional Bonferroni correction was applied, and significance was reported only at a 1% level. The statements, proportions of the sample that replied affirmatively, between-country *t*-test comparisons, and effect size values are listed in Table 3.

The values from Table 3 indicate several interesting trends. A relatively common and prevalent misconception is that DLD can be overcome with hard work, while the fact that it will get worse with age is one of the least prevalent opinions. Despite some common opinions, there are differences in specific opinions between the three countries. As shown in Table 3, Croatia and Italy differ in three out of the eight statements. In most cases (two out of these three), respondents from Croatia provided more affirmative responses. The population residing in this country has significantly more erroneous views regarding the recovery of DLD in preschool age than Italian respondents. They also think that recovery is relatively spontaneous and occurs without any targeted intervention, and this opinion is significantly higher among Croatians than Italians. Although respondents from Italy have significantly fewer such views, they think that DLD can be resolved through education to a much greater extent than Croatians. Both Croatians and Italians believe that people with DLD can overcome their difficulties with hard work. Croatian and Slovenian respondents have different views specifically in relation to spontaneous recovery in the school period. Furthermore, Slovenian respondents are significantly more likely to believe that this condition resolves spontaneously during school age than respondents from Croatia. Significant differences between respondents from Italy and Slovenia were found for two statements. Slovenians are more likely to believe that DLD can be resolved in preschool, but Italians are significantly more likely to believe that recovery can be achieved with proper education. Moderate to very high effect sizes (0.6-0.95), even with a strict significance criterion (1%), indicate that these differences are strong and statistically relevant, especially those reported for comparisons between Italy and Slovenia.

These results indicate three profiles of opinions on recovery or three different types of misconceptions, which are more pronounced in certain countries compared to the other two. Croatians think that DLD can be resolved spontaneously, mostly at preschool age, while Italians attribute recovery predominately to education, and Slovenians think that DLD resolves spontaneously in preschool and school period. Respondents from all three countries have similarly strong views that DLD can be overcome with hard work. Croatia and Slovenia support a *wait and see* approach, which probably results from the general lack of awareness in these countries (Kuvač Kraljević et al., under review). On the other hand, despite the existing misconceptions, Italian residents strongly believe in the education system and believe that deficits in language performance can be reduced with proper schooling.

In summary, there is a relatively common view that DLD is a temporary *disease* that occurs in childhood and can be *cured*, and that symptoms and manifestations of this condition do not change or worsen with time. Such views are hazardous as they disrupt the timely recognition and referral to subsequent services. Similar misconceptions have already been reported in wider European and American contexts (McGregor, 2019; Thordardottir and Topbaş, 2021). Extreme misconceptions, such as those found among people whose lifestyles and traditions differ markedly from that of people residing in Europe and America (e.g., Egypt or Turkey; see Mostafa and Ahmed, 2018; Topbaş, 2006), are much less prevalent, but still present.

Thus, to promote and ensure primary prevention, early recognition, and referral, erroneous views should be discarded and replaced with accurate information. This can be done with carefully planned awareness campaigns that aim to increase knowledge about topics that stand out as particularly misunderstood in specific countries, while at the same time reaching out to the desired target groups (Thordardottir and Topbaş, 2021).

### Preferred ways to disseminate information

After identifying and singling out details on misconceptions regarding the causes and recovery from DLD, we aimed to explore optimal ways

**Table 4.** Preferred ways of disseminating information about DLD in the three countries (mean proportions for all choices per country).

Dissemination possibilities	Croatia (prop. of yes)	Italy (prop. of yes)	Slovenia (prop. of yes)
Web	0.77	0.80	0.77
Brochures, magazines	0.79	0.50	0.82
Campaigns	0.84	0.85	0.64
Education	0.96	0.94	0.90
Groups and discussions	0.86	0.65	0.84
Workshops, lectures	0.95	0.85	0.86
Media, social network	0.68	0.50	0.69

Note: Respondents could choose more than one option.

**Table 5.** Preferred ways of disseminating information in all three countries and differences with respect to the demographic characteristics of respondents.

All respondents (N = 287)			Dissemination activities						
Variables	N		Web	Brochures	Campaigns	Education	Groups	Workshops	Media
Age	Younger (1)	110	0.86	0.60	0.86	0.94	0.76	0.87	0.68
	Middle (2)	90	0.74	0.63	0.72	0.86	0.70	0.82	0.58
	Older (3)	87	0.54	0.69	0.75	0.85	0.39	0.79	0.43
t-test	t (1-2)								
	t (2-3)						<b>t = 4.36; h = 0.6</b>		
	t (1-3)		<b>t = 5.09; h = 0.7</b>				<b>t = 5.58; h = 0.8</b>		<b>t = 3.61; h = 0.5</b>
Gender	Male (1)	120	0.76	0.63	0.79	0.90	0.71	0.8	0.53
	Female (2)	167	0.71	0.64	0.77	0.87	0.73	0.86	0.6
t-test	t(1-2)								
Education level	Prim / sec (1)	161	0.65	0.63	0.71	0.86	0.68	0.80	0.55
	Higher (2)	126	0.83	0.65	0.87	0.92	0.77	0.88	0.60
t-test	t(1-2)		<b>t = 3.58; h = 0.4</b>		<b>t = 3.43; h = 0.4</b>				

Note: Significance is reported at  $p < 0.01$ ; non-significant differences were omitted from the table; t = value of t-test for proportions; h = effect size value.

to disseminate accurate information to the public, taking into account possible differences among the desired target groups. To achieve the optimal effects, awareness activities should be carefully planned (Devilbiss and Lee, 2014). Different groups prefer different activities depending on their age or socioeconomic status. Moreover, individual variations are also observed in language skills, (digital) literacy and proficiency, place of residence, family dynamics, potential for mobility, desire for social engagement, and interest in the topic. We focused specifically on demographic factors that are most likely to contribute to such differences, including age, gender and level of education.

Question 28 consisted of a list of options for the optimal dissemination of information, and the respondents could indicate whether they prefer (yes), do not prefer (no), or do not have a strong

opinion (*do not know*) about those options. First, the preferred activities across all respondents in each country were observed (Table 4). Then, to investigate differences in the preferred ways to disseminate information on DLD between particular groups more thoroughly, several *t*-tests for proportions were conducted across all three countries (Table 5).

Based on the results in Table 4, education, workshops, and lectures are generally accepted and well received by respondents in all three countries. Information disseminated through various media or social networks does not seem to be as desirable, since relatively low values were found in all countries.

Due to the similarities in lifestyles, customs, and beliefs in the three countries (as elaborated above), and given that the distribution of the preferred ways of dissemination is quite alike (Table

4), demographic characteristics of respondents from all three countries were further observed together. Mean proportions across demographic factors, *t*-test values (after applying Bonferroni correction), and effect sizes are reported in Table 5.

Once again, due to multiple comparisons, a Bonferroni correction was applied, and significance was reported only at a level of 1%. After applying this strict criterion, significant differences were found for four types of dissemination methods with respect to two out of three variables examined - age and level of education. No differences were found between men and women in terms of preferred activities to promote knowledge about DLD. They seemed to have similar opinions about all seven opportunities offered to find out more about DLD.

Age stands out as the demographic factor that most strongly determines the preferences of respondents. The opinions of the younger and the oldest groups of respondents were significantly different, with the former preferring information posted on the web, shared via various media, and social networks, or discussed in groups significantly more than the older respondents. Middle-aged individuals did not differ significantly from the younger respondents, but shared similar preferences with the older respondents. The only difference was that they preferred group discussions more than older individuals. These results are not surprising since the options offered in the survey require different skills and efforts, some of which may be especially challenging for the elderly. For example, web, social media, and group discussions require either well-developed digital skills or the ability to engage in joint discussions and react quickly to new content and arguments. Such cognitive skills are known to deteriorate with age. On the other hand, almost every young individual has well-developed digital literacy skills and at least one social media account. Therefore, this type of dissemination seems fairly convenient and simple, and, therefore, preferred, to the younger individuals.

In addition, level of education seems to contribute to the approval or disapproval of information shared on the web or discussed through awareness campaigns. Both are significantly more preferred

by individuals with higher levels of education. It is assumed that individuals with higher levels of education are more likely to surf the Internet in search of different types of information, which likely reflects their digital literacy and browsing skills, as well as the fact that they own and regularly use PCs, tablets, and similar devices. However, the effect sizes for significant differences between individuals with different educational backgrounds was slightly lower, yet moderate, compared to the ones obtained when age was considered (Table 5). Overall, these findings are comparable to those that reported different levels of awareness amongst people from different age groups and those with different levels of education.

### Practical implications

This study highlights the urgent need to start eliminating many existing misconceptions regarding DLD. False beliefs that should be abandoned are mostly related to the specificities regarding the nature, course, and treatment of this disorder. The best way to eliminate misconceptions is to organize promotion activities and awareness campaigns, and the present study has provided some key initial points that all three countries should bear in mind when such activities are being planned. The first step is to define the broader purpose of promotion, i.e., is it simply to attract the public's attention or to educate specific target groups (see Bishop et al., 2012). For the latter, professionals should pay attention to the core characteristics of the target groups, namely age and level of education. If one wishes to reach out to the younger and more educated individuals, one should consider posting relevant information on the web, as well as organising awareness campaigns and group discussions. Educational campaigns led by professionals, brochures, and workshops are more or less uniformly preferred by the participants of this study, irrespective of their individual characteristics. Therefore, such promotions can be a good solution to increase the awareness about DLD among wider audiences. These results suggest that almost all available options can be useful, but professionals must do their best to make full use of these options (Bishop et al., 2012; Thordardottir and Topbaş, 2021).

## CONCLUSION

Despite the fact that DLD is a relatively common neurodevelopmental disorder, even more prevalent than some visible conditions that are far more present within the research community and in the media, its characteristics are still not entirely clear to the general public. Not only is the general awareness of DLD low, but some existing misconceptions are potentially harmful for individuals with DLD as they may interfere with timely detection. The problem of insufficient awareness and knowledge about DLD was recognised globally in the early 2000s (e.g., Bishop, 2010) and some concrete solutions have been offered through publications (e.g., McGregor, 2020; McGregor et al., 2020), international projects (COST Action IS1406: James Law, 2015-2019), public awareness surveys (e.g., Kuvač Kraljević et al., under review; Thordardottir and Topbaş, 2021), and public awareness activities (e.g., Bishop et al., 2012), all aimed at attracting the attention of the public and improving their knowledge. Unfortunately, most of these activities have been conducted in English-speaking communities.

In this exploratory study, we focused on examining misconceptions in three countries - Croatia, Italy, and Slovenia - that share cultural practices, general lifestyles, and SLP research traditions. In addition, we explored optimal ways to address these misconceptions, with the purpose of taking the first step towards organising effective awareness campaigns that target specific groups of the general public and address the most urgent topics. We found that, in all three countries, the public was generally misinformed and thought that DLD is

a temporary condition that emerges in childhood, probably as a result of other developmental conditions, and that it will pass either spontaneously or with hard work and proper education. These findings show a significant lack of knowledge and point to the need for continuous awareness campaigns targeting specific groups of people.

The way in which important information should be disseminated to the public depends on age and levels of education. Therefore, promoters (ideally researchers and clinicians) must either apply concrete activities that target specific groups of people or various types of dissemination activities that can reach a broader public, regardless of age and level of education. These steps are important because limited knowledge leads to the accumulation of misunderstandings, misconceptions, and false beliefs, thus, indirectly reducing the possibility for appropriate and timely intervention.

### Declaration of interest

This work was submitted, processed, and finalised by the Journal before the first author became a member of the Editorial Board.

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**APPENDIX****Three analysed Public Survey questions**

*Q 16. Why do you think developmental language disorder happens?*

		Yes	No	Don't know
a.	It is inherited from family			
b.	It happens because of intellectual disabilities			
c.	It happens because children who have it are being punished by fate or God			
d.	It happens because of spirits or demons			
e.	It has an organic medical origin			
f.	It has a psychological origin			
g.	It is acquired through faulty learning/mislearning			
h.	It results from brain damage			
i.	It results from environmental factors, for example poverty, inadequate nutrition			
j.	It results from mental health problems, for example depression, anxiety, emotional problems			
k.	It results from behaviour problems, attention deficit disorder, or hyperactivity			
l.	It results from autism			
m.	It results from dyslexia			

*Q 17. Do you agree with the statements below about developmental language disorder?*

		Yes	No	Don't know
a.	Typically resolves itself spontaneously at preschool age			
b.	Typically resolves itself spontaneously at school age			
c.	Can be resolved with hard work			
d.	The child can overcome his/her problem on his/her own			
e.	Can be resolved at a later age, as it did in other cases that I know of			
f.	Doctors typically recommend a "wait-and-see" approach			
g.	Can be resolved through education			
h.	Will get worse with age			

*Q 28. What would be good ways of sharing information about developmental language disorder?*

		Yes	No	Don't know
a.	Current, accurate knowledge on websites			
b.	Brochures/magazines, leaflets			
c.	Awareness campaigns			
d.	School education			
e.	Sharing experiences of parents in group sessions, web-based interactive groups etc.			
f.	Information sessions, workshops at preschools			
g.	Social media campaigns			