Developmental Dyslexia: An Exploratory Study Using Thematic Analysis of the Self-Reported Reading Difficulties of Monolingual and Bilingual Adults

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Abstract

This exploratory study investigated the self-reported reading difficulties and compensatory strategies of monolingual and bilingual adults with dyslexia. Twenty monolinguals and six bilinguals answered a questionnaire that collected socio-demographic data as well as information regarding their reading difficulties, experiences, and possible comorbidities. Data were analyzed using thematic analysis. Four themes were determined: (a) reading difficulties may be pervasive but can be circumvented with effective coping strategies; (b) individuals with dyslexia can succeed academically and obtain a university degree, but they most likely have to work harder than typical readers; (c) dyslexia has an impact on reading habits, and reading is a challenge; and (d) comorbidities are a part of life for people with dyslexia. Our results highlight the struggles that individuals with dyslexia continue to have, regardless of when they were diagnosed, whether they received literacy assistance, and whether they learned a second language. Most important, this study shows that individuals with dyslexia, both monolinguals and bilinguals, are able to use effective coping strategies and obtain academic and professional success.

Keywords: Bilingualism, developmental dyslexia, thematic analysis, self-reported reading difficulties

Reading is a complex activity that encompasses component processes such as decoding, literal comprehension, and inferential comprehension that must be executed in order to achieve global comprehension of the text (Gagné et al., 1993). In typical reading learning settings, children, by being exposed to input in their surroundings and with the help of school and/or with mediation, learn to read naturally. That is, they break the code and gradually master the component reading processes mentioned above. However, in atypical learning situations, as is the case of dyslexia, the child rarely proceeds through the level of decoding without some kind of assistance (Shaywitz & Shaywitz, 2005).

Dyslexia is considered a neurobiological learning disability whereby individuals present problems in relation to word recognition, spelling, and decoding (International Dyslexia Association, 2002; Muszkat & Rizzuti, 2012; Shaywitz & Shaywitz, 2005). In this sense, the primary difficulty in dyslexia would be connected to a problem in recoding the graphemic input into its phonemic representation (Gagné et al., 1993), hampering access to the meaning of the word in memory. The child with dyslexia presents difficulties

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in learning how to read, even when the learning conditions are adequate and even when other cognitive abilities are intact (Muszkat & Rizzuti, 2012).

According to Shaywitz and Shaywitz (2005), dyslexia does not remediate by itself, and although some individuals obtain success with reading materials on their own, their reading remains extremely slow, nonfluent, and not automatized. Research also shows that difficulties in relation to writing (e.g., Hebert et al., 2018; Sterling et al., 1998), reading comprehension (e.g., Georgiou et al., 2022; Snowling et al., 2020), visuospatial orientation (e.g., Lipowska et al., 2011), and math (e.g., Snowling et al., 2020) may be persistent in the life of those with dyslexia. Nevertheless, despite the difficulties faced by those with dyslexia, many stand out in a range of professions (Shaywitz & Shaywitz, 2005). As everyday teaching and clinical practice show (and research in the area corroborates), many people find ways to circumvent the difficulties imposed on them by dyslexia and succeed both academically and professionally.

Though many studies have assessed the experiences of monolingual individuals with dyslexia (e.g., Borga, 2007; Gibson & Kendall, 2010; Leitão et al., 2017; O'Byrne et al., 2019), research is still scarce on the experiences of bilinguals with dyslexia, and among existing studies, only one has used thematic analysis (Dimililer & Istek, 2018). Support for possible differences between monolinguals and bilinguals derives from the "bilingual advantage theory" (e.g., Bialystok, 2015), according to which the production of each language necessitates the cognitive demand of constantly choosing between the parallel activated words and grammatical rules of the alternative language, possibly leading to an enhancement of the executive control system. As such, it is possible that individuals with bilingual dyslexia have a better experience of their learning difficulty. To test this idea, one aim of the present qualitative study was to explore the self-reported reading difficulties and compensatory strategies of both monolinguals and bilinguals with dyslexia, in the light of possible comorbidities and highest education achieved.

Theoretical Framework

Dyslexia and Comorbidities

It is relatively common for individuals with dyslexia to have a co-existing learning difficulty, neurodevelopmental disorder, or mental health concern (Hendren et al., 2018; O'Byrne et al., 2019). For example, it is estimated that 2–10% of the population experience learning difficulties, and a significant proportion of these have associated comorbidity (Margari et al., 2013; Moll et al., 2020).

According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychological Association, 2013), the co-occurrence of a second disorder may be diagnosed either as *homotypic comorbidity*, where the diagnosis shares the same diagnostic group (e.g., dyslexia and dyscalculia – the math equivalent of dyslexia), or as *heterotypic comorbidity*, where the secondary diagnosis is from a different diagnostic grouping (e.g., dyslexia and attention deficit hyperactivity disorder [ADHD], or dyslexia and autism spectrum disorder [ASD]; Moll et al., 2020; Saunders & Waldie, 2016).

Homotypic comorbidities share a larger proportion of prevalence; for example, dyslexia and dyscalculia share 40% of genes (Wilson et al., 2015), whereas dyspraxia and dyslexia share a prevalence between 20 and 50% and appear to have greater overlap in symptoms (Kirby et al., 2008). Specifically, dyscalculia is the most common comorbidity with dyslexia (around 37–40%), and individuals with dyscalculia have difficulty learning and comprehending arithmetical knowledge and skills (Peters et al., 2018; Wilson et al., 2015). These difficulties often continue and may be present in adulthood (Wilson et al., 2015).

On the other hand, heterotypic comorbidities appear to have a shared genetic linkage that may lead to a greater prevalence of co-occurrence in some combinations. For example, studies have found that risk genes (KIAA0319 and DCD2) overlap and may result in the shared symptomology between the dyslexia and ADHD (for a review, see Hendren et al., 2018). These findings are further supported through neuroimaging studies that have found overlap across structural and functional areas in both disorders (Germanò et al., 2010).

Many individuals with dyslexia experience anxiety, and the associated prevalence between anxiety and learning disorder is 9–29% (Margari et al., 2013). Much of this anxiety is thought to be associated with self-doubt around personal strategies in reading and word recognition, which may increase stress, and, in some cases, lead to generalised anxiety disorder (GAD; Haft et al., 2019). In addition to anxiety, many also report depression or depressive symptoms, feelings of inadequacy, and stigma (Higgins et al., 2002), which can lead to more negative experiences in the education system (Spencer et al., 2016) and further delay positive learning outcomes (Haft et al., 2019).

Dyslexia and Bilingualism

To date, there is little consensus in the literature on the definition of the term "bilingualism." In the present study, we followed Marini and Fabbro (2007), who view bilingualism, or bilingual competence, as part of multilingualism, and involving the use of two languages, no matter how proficient the speakers are in each of them and no matter when they acquired them.

In recent years, a growing number of studies have explored how bilingualism can help individuals with dyslexia (do Amaral & de Azevedo, 2021). A bilingual advantage has been observed in cognitive control (see Van den Noort et al., 2019, for a review), morphological skills (Bialystok et al., 2014), phonological awareness (Kang, 2012), and decoding skills (Janssen et al., 2013). Also, factors such as speed, accuracy, and proficiency in the first language (L1) are predictors of skills in the second language (L2) (Park et al., 2012).

The scant studies on bilingualism and dyslexia show the role of various phonological-orthographic features of two languages in different spelling errors (Abu-Rabia & Sammour, 2013) and reading proficiency in both typical bilinguals (Shimron & Siman, 1994) and bilinguals with dyslexia (Abu-Rabia & Sammour, 2013). Concerning how the bilingual advantage may extend to adults with dyslexia, it has been shown that orthographic consistency in two languages modulates the manifestation of dyslexia in bilinguals (Lallier et al., 2018). In fact, lower deficits in pseudoword reading and spelling in bilinguals with dyslexia have been found compared to their monolingual peers, due to cross-linguistic transfer (Lallier et al., 2018).

Investigations into the interaction between bilingualism and dyslexia in morphology skills have found that both typical and bilingual children with dyslexia outperform or have the same performance as monolingual children in terms of accuracy in production of both word and nonword plural determiners (Vender et al., 2018). However, comparisons of bilingual and monolingual readers in reading, writing, and reading comprehension revealed that bilinguals with dyslexia did not outperform reading comprehension of L1 (Bonifacci et al., 2017).

A recent study found that bilingual and monolingual children with and without dyslexia applied various strategies for reading comprehension, and participants with dyslexia had lower performance in reading comprehension in both languages (Kirana, 2022). Different factors, including cognitive skills, psychological factors, and language exposure, are all involved in variations in reading comprehension (Friesen & Frid, 2021; Li et al., 2020).

Reported Experiences of Dyslexia Using Thematic Analysis

Thematic analysis research gained clarity, organization, and orientation with the systematization provided by Braun and Clarke (2006) in their landmark study "Using Thematic Analysis in Psychology." Since then, this framework has been used in a number of qualitative studies with a focus on understanding the impact of dyslexia on monolinguals' academic and personal life.

In a three-year longitudinal multiple-case design study, Borga (2007) investigated the self-perception of Norwegian university students with dyslexia and their strategies for overcoming difficulties. Thematic analysis revealed a set of common themes: difficulties with word recognition and spelling, followed by difficulties with reading comprehension and producing sentences in writing; time pressure, to which participants responded by working on weekends and holidays; dreams of becoming a teacher; awareness of learning advantages and disadvantages; support from family and friends; and choice not to seek university support.

In an investigation using child- and parent-reported perceptions of living with dyslexia, Leitão et al. (2017) found that children had negative self-perceptions and feelings of frustration over lacking academic skills and not knowing why prior to dyslexia diagnosis, and, in general, reported feelings of relief and acceptance, after receiving a diagnosis, especially when experiencing support, encouragement, and self-belief.

In a one-year follow-up study with four students who had just entered university, Gibson and Kendall (2010) investigated relations between academic achievement and learners' feelings of intimidation, negative self-perception and low self-esteem due to reading difficulties. Results showed that being placed in lower tracks at school had a negative impact on students' self-esteem and motivation; they were discouraged from taking science and foreign languages and encouraged to go for vocational qualifications; learners had to face negative teacher attitudes, lack of support and low expectations; and the struggle through school had a negative impact on self-confidence and academic work.

Also using the university context as background, O'Byrne et al. (2019) explored five students with dyslexia as they transitioned to university. They found four major themes in the students' narratives: (a)

identity as a person with dyslexia and being able to use a range of different strategies in order to deal with the difficulties encountered; (b) self-advocacy, realizing own strengths and weaknesses; (c) transition experiences entering university, facing the disorder model (seeing dyslexia as a condition that brings difficulties in learning situations) and moving to the difference model (accepting that dyslexia requires strategies that are different from those that are usually offered to typical students); and (d) future advice, for incoming students to look for help, and for the disabilities services to address the different needs individuals with dyslexia might have.

As noted, although studies of dyslexia among monolinguals abound in the literature, research is still lacking on bilinguals. Only one study (Dimililer & Istek, 2018) has used thematic analysis to investigate bilinguals' experiences with dyslexia, a gap we hope to begin filling with the present study. Dimililer and Istek (2018) analyzed the difficulties faced by a 7-year-old child learning English as a foreign language in elementary school. Their findings pointed to two major problem areas: linguistic features (such as pronunciation, spelling, reading and writing) and memory, leading to deficits in word finding, memorization, and object naming.

Taking the results from earlier studies as well as the gaps in the literature into account, the aim of our exploratory study was to investigate the self-reported reading difficulties, comorbidities, and compensatory strategies of both monolinguals and bilinguals with dyslexia. We hypothesized that we would find differences in the self-reported reading difficulties of the two groups. That is, in accordance with the bilingual advantage theory, we predicted that bilinguals with dyslexia would have a better educational experience and general self-reported increase in cognitive flexibility than monolinguals.

Method

Participants and General Procedure

A total of 26 individuals with dyslexia participated in our study: 19 females and 7 males, with ages between 18 and 52 years. There were 20 monolinguals with dyslexia (DM) who were native speakers of English, and six bilinguals with dyslexia (DB): three speakers of English as a second language (having learned English after the age of 6 and native speakers of Dutch) and three who were raised as bilinguals in English and Hindi, Malay and Tamil, respectively, having learned English before the age of 6 years of age.

Participants were recruited through advertisements posted around the University of Auckland campus and via social media. Recruiting was kept open for a period of 10 months, due to the difficulty of finding bilinguals with dyslexia, a limitation that is common in this area, with scarce studies including no more than four participants (Azevedo, 2016; Dimililer & Istek, 2018; Park et al., 2012; Valdois et al., 2014).

The study proposal was submitted to the University of Auckland Human Participants Ethics Committee (UAHPEC) and obtained approval under reference #021103.

Demographic Questionnaire

A 11-item non-standardised questionnaire was mailed to potential participants who responded to our call to gather information on (a) highest education; (b) age of dyslexia diagnosis; (c) therapy/support received; (d) reading difficulties faced when diagnosed; (e) reading difficulties faced at the time of data collection; (f) impact of dyslexia on academic reading; (g) impact of dyslexia on reading habits; (h) comorbidities; (i) psychoactive medication; (j) mother tongue; and (k) additional languages spoken.

Thematic Analysis

The demographic questionnaires were scrutinized for themes and patterns following the thematic analysis framework proposed by Braun and Clarke (2006), who advocate that themes be abstracted from patterns found in the data and directly connected to the research objectives. The framework comprises six phases, including familiarizing oneself with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Each phase allows the researcher to go deeper into the data, and analysis does not go linearly from the first to the sixth step, inasmuch as the researcher revisits previous and later phases as necessary (Braun & Clarke, 2006).

In thematic analysis, the analytical process is inductive in nature in that the themes arise from patterns detected in specific observations in the data. Recently, the subjectivity of the researcher has been added to the model now named reflexive thematic analysis since researchers use their discernment and theoretical background in order to analyze and interpret the data (Braun & Clarke, 2020).

In the present study all six steps were followed. Whenever possible, we attempted to avoid using the topic of questions themselves as themes and focus-

ing, instead, on issues brought up by participants in their answers to the questions posed.

Results

Thematic analysis revealed four recurrent themes in the protocols of both monolinguals and bilinguals: (a) Reading difficulties may be pervasive throughout the life of an individual with dyslexia but can be circumvented with effective coping strategies; (b) Individuals with dyslexia can succeed academically and obtain a university degree, but they most likely have to work harder than their typical reading peers; (c) Dyslexia has an impact on reading habits, and reading is usually seen as a challenge; and (d) Comorbidities are often a part of dyslexia.

Each one of the four themes is presented below accompanied by excerpts from participants' protocols to illustrate the themes and subthemes. Participants' writing was preserved in the way they were found in the protocols, meaning that spelling mistakes were not corrected, since they are evidence of the difficulties faced by individuals with dyslexia.

Theme 1: Reading Difficulties May Be Pervasive Throughout the Life of an Individual With Dyslexia But Can Be Circumvented With Effective Coping Strategies

Most participants, 17 of 26, reported having received a dyslexia diagnosis before the age of 12. The remainder said that they were diagnosed as adults, and three could not recall. Half (10 out of 20) of the monolinguals with dyslexia (DM) and half (3 out of 6) of the bilinguals with dyslexia (DB) reported not having received any kind of therapy/support for dyslexia. Among those who received some form of therapy, seven (six DM and one DB) mentioned the SPELD[1] (SPEcific Learning Difficulties) program (see Waldie et al., 2014); one (DM) reported having received vision training; and four cited having received some form of guidance or remedial teaching from a logopedist/speech-language therapist (one DB), educational psychologists (two DM), and/or school (four DM and one DB).

In relation to the reading difficulties faced at the time of diagnosis, the following subthemes (presented in order of priority) emerged as the most recurrent for both DM and DB: (a) misreading, or not being able to read words out loud, especially nonwords or unknown ones; (b) reading slowly; (c) having trouble understanding written directions and instructions; (d) writing; (e) reading comprehension; and (f) math.

Subtheme A – Misreading, or Not Being Able to Read Words out Loud, Especially Nonwords or Unknown Words

"Reading out loud as a child was terrifying and not something I would ever volunteer" (DM11).

The testimony above represents the suffering that a child with dyslexia may experience and portrays the first subtheme. All participants with dyslexia, both DM and DB, reported this difficulty: e.g., *"I was pretty bad at reading things out loud, stumbling over words and saying them slightly in the wrong order"* (DM03); "[…] *read the wrong word.* […] *especially when reading out loud"* (DB01).

Subtheme B – Reading Slowly

"*I found it very challenging to decode a word using phonetics and often took a long time to match a word that I knew verbally to it written down"* (DM12).

The sophisticated and clear answer given above shows DM12 knew exactly what was happening and why the slow reading. Reading slowly was a problem mentioned by all participants (both DM and DB): e.g., "*I am a slow reader*" (DM06); "*I read very slowly; so slow that it was impossible to read out loud*" (DB02).

Subtheme C – Having Trouble Understanding Written Directions and Instructions

"I found it hard to follow instructions, order things that need to be written down. […] *I found it hard to be self-organised*" (DM09).

One DB and three DM reported having trouble understanding written directions and/or instructions: e.g., *"I had trouble with directions"* (DM03); "*Comprehending instructions was a little hard*" (DB04).

Subtheme D – Writing

"*My reading comprehensions was above average for my age when it came to discussing what I had read. But when it came to writing down what I read this was nearly impossible. Putting down what I know on paper was not easy, issues with spelling, sentence structures and been able to recite in a logical way.* […] *I failed ½ of my 1st and 2nd year papers and struggled with written*

[1]According to Brooking and Rowlands (2010), "SPELD NZ, the Specific Learning Disabilities Federation, is a not-for-profit organisation which was set up in 1971 to help children who are not realizing their educational potential because of various specific learning disabilities. […] SPELD has four main objectives which are advocacy, assessment, tutoring, and family support. The organisation's primary goal is to work with students with Special Learning Disabilities (SLDs), building their self-esteem and skills and strategies, assisting them to be more engaged with school and so more likely to achieve" (p. 1).

exams, I would pass papers that where written exam based with Cs but anything that have hands on or creative testing like CAD I passed with A+" (DM10).

As portrayed in the example above from one of the participants' protocols, writing is a laborious activity for many individuals with dyslexia, mentioned by 10 DM (50%) and 2 DB (33, 33%) in this study. The problems cited include issues related to spelling, syntax and grammar, text organization, and encoding thought into text, as depicted in the following excerpts: "*Reading and writing was frustrating and I didn't want to do it*" (DM02); *"[Difficulties with] Expressing myself. I could understand something at quite a deep level but find it hard to explain or write about something without it sounding very basic*" (DM09); "*I was unable to copy something from the whiteboard or take notes because I was slow at writing and could not spell; I then could not follow the teacher"* (DM09); "[...] *writing difficulties*" (DM13).

The great majority of both DM and DB participants mentioned they had had and/or still had spelling problems; in addition, some who did not refer explicitly to this difficulty exhibited spelling mistakes in their protocols: "*Difficulties speaking allowed"* (DM01); "*Difficulties spelling words*" (DM05); "*Difficulty spelling when writing*" (DM06); "[...] *difficult in spelling unfamiliar words*" (DM07); *"My spelling and grammar are still not that great"* (DM16); "*I can't spell words I know I should be able to*" (DM20); "*I was bad at spelling. I still have the same difficulties*" (DB01); "*I was bad at spelling - when writing. I never understood irregular spelling (things spelled differently from their pronunciation.* [...] *I still make a lot of spelling mistakes"* (DB02).

Subtheme E – Reading Comprehension

"*My reading comprehensions was above average for my age when it came to discussing what I had read"* (DM10).

For participant DM10, comprehending the content of the text seems to be fine, when compared to the arduous work that writing represents, as previously reported in subtheme D. Three other participants join DM10 in reporting not having problems with reading comprehension (DM11, DB01 and DB02): e.g., "*I do not read fast, however my comprehension is not too bad*" (DM11); "*My vocabulary and reading comprehension were above average for my age*" (DB01); "*I never had any problems with reading comprehension*" (DB02). However, for other participants, reading comprehension continued to pose difficulties, as the following excerpts illustrate: "*Yes* [still face reading difficulties] – *speaking allowed, speed processing and understanding text"* (DM01); "*I also have a hard time reading and absorbing what was written on particular days*" (DM03); "*I sometimes have to reread passages to actually understand*" (DM04); "[...] *not understand the text being read*" (DM07); "*While I enjoy reading novels and read often, I find reading and comprehending text books and articles a struggle*" (DM12); "*If the words are too difficult, I still find it hard to comprehend text*" (DM16); "*I have to read very slowly and often re-read a line many times to get it properly*" (DM19); *"Yes, all of the above* [difficulties previously mentioned]*, but I have gotten better at spelling and reading (obviously), but I still find it very hard to get meaning from text I have read for the first time*" (DM20); "*I still occasionally do have difficulty in comprehending what I'm reading*" (DB04); "*I would focus on reading the words rather than comprehending the text and I would have to reread.* [...] *I still have to reread sometimes"* (DB06).

Subtheme F – Math

"*Numbers confused me and because of that I developed a hatred for math.* [...] *Numbers still confuse me and I still hate doing math*" (DB04).

Only 4 of the 26 participants with dyslexia (DB04, DB03, DM03, and DM08) reported having difficulties with math, and of these only DM03 mentioned having been diagnosed with dyscalculia. Interesting, one participant reported: "I was good at math but if I could not read the question, I would not be able to show my ability" (DM09).

From the testimonies presented so far, it is clear that most of the difficulties encountered by individuals with dyslexia as children learning to read and write continue throughout their life: e.g., "*All of the above* [difficulties encountered at the time of diagnosis]*, but less than I used too. If I am under stress/pressure, I tend to make more mistakes*" (DM06); "*I still face the same difficulties; however, I think I learned how to deal with them in a better way and became more aware of them. Therefore, I think my overall writing and reading skills have improved*" (DB01).

It is also notable that these individuals with dyslexia, both monolinguals and bilinguals, have found ways to circumvent the difficulties they encounter and have developed strategies, specific to reading or more global, to deal with them. Some of the specific reading and study strategies cited include rereading and skimming through the written material to build prior knowledge and to get a global view or the gist of the content being discussed: e.g., "*My key strategy is to read the text book and case studies in a random order in the first week of the course, helps me form the context and broader view of the paper"* (DM10); "*It's easier now I know I'm dyslexic and it's easier having strategies to deal with academic papers such as reading the*

abstract, intro and conclusion/findings to cut down the time and processing of all the information" (DM17); "*I would focus on reading the words rather than comprehending the text and I would have to reread*" (DB06).

Use of some form of technology was also a strategy cited by most participants, including audiobooks, text-to-speech voice readers, computer spell-check, radio apps (news broadcasters), and formatting the text on the computer to change spacing and colors. For example, "*I usually format all my books on my laptop and phone to have wide spacing and I swap the colour to white and black.* [...] *I rely on explorer to read out a passage, so I can understand the text quicker and with more accuracy*" (DM03); "*I read an article a day on the RNZ app and Reddit*" (DB06). A more rudimentary technology, but probably effective for the reader's purposes, was to use a finger as a guide throughout the page, as cited by DM11.

Some participants mentioned counting on others to help; indeed, some of the strategies cited may involve a great deal of commitment from family members: e.g., "*I have to have 10mins extra time per hr of examination. During my hon's degree, I'd get my partner to read papers out loud for me to save time*" (DM06). A number of the strategies mentioned are not typical and may involve full commitment from family members, showing how they may fully engage themselves in providing the necessary support to help their loved ones: e.g., *"I couldn't read very well until I was about 11. From 9 through 11 I travelled with my family though the Pacific on a yacht and there was little to do a lot of the time other than read. Over that time my reading improved markedly. I now spend most of my day in front of a computer for work and read a lot for pleasure*" (DM02).

Some other strategies with family members may work for all the parties involved, with benefits to both: e.g., "*Pretty much the same [Face same difficulties as when diagnosed] but I have improved with reading words out loud as I've practised this when reading bedtime stories to my son – progressing from the baby books to books for older children (he's 8 now)*" (DM17).

Theme 2: Individuals With Dyslexia Succeed Academically and Obtain a University Degree, But They Most Likely Have to Work Harder Than Their Typical Peers

"*I moved school at 9 because a teacher from overseas was there and she had a lot of experience teaching dyslexic children, she was great doing full body learning and using brain gym (taught us tennis). Went to SPELD at 10–13 and did not enjoy it – she tried to make it interesting, but it was one on one and intensely focused on sounding out words and spelling. Lost my self-confidence. Had no help at school not even for exams, my dad read to me throughout my schooling because I couldn't, left school with no qualifications. At tech for my hairdressing diploma they picked up I was dyslexic and got me a reader/writer for my exams. I have use this and a notetaker when studying at a degree and Masters level in recent years"* (DM09).

Despite the difficulties DM09 has gone through academically and emotionally, she has successfully obtained a master's degree. Our results show that, from the 26 participants in the dyslexia group, 17 (13 DM and 4 DB) reported having a university degree or taking a university course at the time of data collection. From these, three had already obtained or were enrolled in a master's (two DM and one DB) or a PhD degree program (one DM and one DB).

These numbers are high, considering the reading and writing difficulties these individuals have to face, and show resilience and perseverance to finally attain their objective of entering university and/or obtaining a university degree: e.g., "*When there are multichoice questions in the lecture which we must read and answer, I usually quickly give up and learn nothing. Usually I just put time into doing readings. Luckily Engineering (what I'm studying) usually uses a lot a diagrams and less words*" (DM03); "*I entered uni as an adult student and had to do make up classes to bring up my written skills. [...] My key strategy is to read the text book and case studies in a random order in the first week of the course, helps me form the context and broader view of the paper*" (DM10). However, these results should be viewed with caution, as participants were recruited mainly through advertisements on and around a university campus, a limitation we address later in this text.

What seems to be clear from the data is that individuals with dyslexia have to work harder than their typical peers in order to succeed academically, and they are well aware of this. The excerpts brought here are from participants who had already obtained a university degree or were taking a university course during the time of data collection: e.g., "*It has been huge [impact on academic life]. I have had to listen to my own essay drafts (using read out loud) to make sure I understand my own writing and reasoning. I have spent hours reading and rereading something other could read in 30 mins"* (DM09); "*It took me a few years to figure out how I learn and combined that with better access to computers my grades improved*" (DM10); "*In high school most of my reports said something along the line of DM12 is not work-*

ing to her full potential and could try harder, or DM12 is a bright students whose work and marks do not reflect this" (DM12); "*I still read very slowly compared to people I know*" (DB02); "*I feel that it takes me twice as long as my peers to comprehend the text*" (DB04); "*It would only take me longer to read and I feel that I wasn't able to do as much research compared to my peers*" (DB06).

Theme 3: Dyslexia Has an Impact on Reading Habits, and Reading Is Usually Seen as a Challenge

As discussed, reading represents a great challenge for individuals with dyslexia, and although they usually bypass difficulties with the use of effective strategies, dyslexia has an impact on the way they view reading and on their reading habits: e.g., "*This has ultimately resulting in me not reading very much at all despite high interest in books, actually reading them is a difficult task for me*" (DM01); "*I only read what I have to. Have only read one novel in its entirety in my entire life, and that was The Hobbit by JRR Tolkien*" (DM06); "*I have never enjoyed reading as it has always been challenging*" (DM11); "*I like the idea of reading novels for pleasure but I try to avoid it. - It takes a lot of time and I read only 4 pages before I get tired.*" (DB06).

In order to find further support for the assertion that individuals with dyslexia view reading as a challenge, we carried out a lexical analysis of the protocols, looking for the word *challenge* and any other related word that denoted some negative meaning in relation to reading. Although representative, we decided not to include the word *difficulty* in the analysis, since it was part of our questionnaire.

Results revealed 189 words that denoted a negative meaning. The numbers in parentheses below represent how many times the word appeared in the protocols, as follows: the particle *NOT* (e.g., as in *do/did/would/could not*, including contracted forms) (62); *hard/er* (23); *slow/ly/er* (18); words with the prefix *mis* (e.g. *mistake; misunderstanding; misreading*) (13); *struggle/d* (09); *challenge/ing* (09); *confuse/d/ing* (07); *bad* (06); *never* (06); *wrong* (05); *inability/ unable* (04); *fail* (03); *problem* (03); *skip/ping/ped* (03); *tricky* (03); hate/hatred (02); *impossible (02)*; *stumbling over* (02); *trouble* (02); *annoying* (01); *awful* (01); *backlog* (01); *frustrating* (01); *incorrectly* (01); i*ssues with* (01); and, *mixed up* (01).

Theme 4: Comorbidities May Be Part of the Life of an Individual With Dyslexia

Of our 26 participants, 11 reported comorbidity. Anxiety or depression was the most common (reported by six participants each), with four participants reporting having both anxiety and depression. Three reported having obsessive-compulsive disorder (OCD), and one reported having dysgraphia and dyscalculia. The three participants who reported having OCD also said they suffered from both generalized anxiety, and two reported suffering from depression. Only four participants reported taking some kind of psychoactive medication.

A closer inspection of the data disclosed findings worth noting. First, from the participants with dyslexia and comorbidities, only three were bilingual: one reported having had two episodes of depression, another mentioned OCD and generalized anxiety, and the third reported having dysgraphia and dyscalculia. Second, no bilinguals with dyslexia reported taking psychoactive medication. Although we see these findings in relation to DBs as worth reporting, we are aware that our sample of only six DB is too small to make strong claims and should be interpreted with care.

Last, individuals with dyslexia entering university are part of a privileged group that may have fewer comorbidities (Callens et al., 2012). Our results show that, from the 17 individuals with dyslexia who reported having or taking a university degree at the time of data collection, as reported before, seven mentioned some kind of comorbidity (one DB and six DM), and two mentioned taking psychoactive medication (two DM). From the remaining nine participants who did not report having or taking a university degree, six were between 18 and 20 years old (four DM and two DB) and reported having a high-school degree (one DB aged 18), NCEAL3 degree (one DB aged 20 and three DM – two aged 19 and one aged 20), and NZQAL4 degree (one DM aged 18). Of the other three participants, one reported having two certificates – in trade hair dressing and in swim teaching (DM aged 45), another mentioned a diploma in UX and design, and the third mentioned having left school at the age of 14 for an apprenticeship (DM aged 48).

Discussion

Our results highlight the struggles that adults with dyslexia continue to have – regardless of when diagnosed, whether they received literacy assistance, and whether they learned a second language. Most important, this study shows that individuals with dyslexia, both monolinguals and bilinguals and those with existing comorbidities, can use effective coping strategies and obtain academic and professional success.

Our findings in relation to the reading difficulties encountered by individuals with dyslexia are corroborated by earlier research showing that readers with dyslexia exhibit difficulties with reading words out loud (Lallier et al., 2018); reading slowly (Shaywitz & Shaywitz, 2005); with visuospatial orientation (Lipowska et al., 2011); with writing (Hebert et al., 2018; Sterling et al., 1998); with reading comprehension (Georgiou et al., 2022; Snowling et al., 2020; Wilson et al., 2015); and with math (Snowling et al., 2020; Wilson et al., 2015).

Although there is little empirical evidence to show that individuals with dyslexia have trouble understanding written directions and instructions, we suggest that these difficulties are related to the working memory component mentioned by Lipowska et al. (2011): the Visuo-Spatial Sketch Pad (VSSP; Baddeley, 2012). These authors found that children with dyslexia exhibited poor visuospatial functioning that could not be explained by any language difficulties.

In the present study, our participants cited other related problems that involved organization: not keeping track of the line being read; reversing letters; skipping lines; difficulty in doing symmetric tests; and seeing words slide across the page. We suggest that these problems may be traced to the same root, involving the VSSP component. The VSSP is involved in the construction of a mental model during reading, representing the meaning of the text visuo-spatially (Glenberg & Langston, 1992). Impairment in this component might explain the difficulty found by individuals with dyslexia in the aforementioned aspects, as they all depend on being able to visualize a sequence of events and finding out how they relate spatially to one another.

Our results are also corroborated by earlier research showing that readers with dyslexia exhibit problems in writing. Specifically, they have difficulties with spelling (Hebert et al., 2018; Sterling et al., 1998), with the organization and development of the ideas in the text, and with vocabulary and handwriting (Hebert et al., 2018). Two main reasons have been identified for why dyslexia and problems in writing are found together: first, both reading and writing rely on phonological information (decoding written words in reading and encoding thought into writing), a process that has been found to be a struggle for individuals with dyslexia (Hebert et al., 2018; Sterling et al., 1998); and second, reading is needed during the writing process, whether to gain knowledge about the subject before writing or to revise one's own text as a writer (Hebert et al., 2018).

Some of our participants (4 of the 26) reported not having difficulties with reading comprehension. In fact, the majority of those who reported having comprehension difficulties signaled it was a problem that happened *sometimes*, *occasionally*, *on particular days*, *when the text was read for the first time*, suggesting it is usually solved with strategies such as reading the text slowly or reading it more than once. These results are corroborated in the literature. For example, in a recent meta-analysis of the reading comprehension deficits of individuals with dyslexia, Georgiou et al. (2022) confirmed that those with dyslexia experience comprehension problems, but they also found that the effect sizes for these problems were smaller than those observed for word reading and spelling. Comprehension deficits may be related to poor decoding and oral language skills (Georgiou et al., 2022; Snowling et al., 2020).

Only 4of our 26 participants reported having difficulty with numbers, known as dyscalculia (Snowling et al., 2020). In fact, the literature shows that dyscalculia is experienced in about 6% of children (Wilson et al., 2015), which seems to be consistent with our results. In some instances, for up to about 10% of children, reading and numerical difficulties overlap. What is unclear is whether this overlap is due to core difficulties experienced in dyslexia or with higher-order processes associated with comprehension or procedural memory (Wilson et al., 2015), similar to what is described by some of our participants: e.g. *"I was good at math but if I could not read the question, I would not be able to show my ability"* (DM09) ; *"[...] would often get really confused with things like fractions and the x/y axis"* (DM03).

Both monolinguals and bilinguals with dyslexia in our study circumvented some of the difficulties they encountered by developing a set of strategies, both specific to reading and more globally. Strategies are generally seen as purposeful and deliberate actions taken by the learner to help achieve a goal (Afflerbach et al., 2008; Borga, 2007). Strategies in the specific context of dyslexia are typically called "coping strategies," seen as those behaviors and actions that come in response to the difficulties faced by individuals with dyslexia (Borga, 2007).

In the context of typical readers, the use of reading strategies can boost and speed up a process that would, otherwise, simply take longer, such as for English as a Foreign Language (EFL) learners, used to compensate for a lack of linguistic knowledge, but that could naturally happen at some point in their learning trajectory with continuous input. In this line of thinking, and in agreement with both Borga, the more global and/or specific strategies used by individuals with dyslexia are indeed coping strate-

gies and not only learning or reading strategies per se. They usually arise in the context of stressful situations, very often accompanied by failure to comply with what is offered to typical learners at schools, thus putting individuals with dyslexia at a risk of failure to read and learn.

Our findings also are consistent with earlier studies that have found that, because of determination and putting in extra work, an increasing number of students with learning difficulties succeed academically and graduate from institutions of higher learning (Bacon & Bennett, 2013). Challenges during their academic experiences in higher education have been reported with respect to note-taking, organizing essays, expressing thoughts in writing as well as peers', teachers', and academic staff members' attitudes and reactions towards disclosure of dyslexia (Mortimore & Crozier, 2006). Taylor-Talley (2018) found that college students were facing challenges that included accelerated pace, communication, time management, and concentration. In line with other literature (Mortimore & Crozier, 2006), our study further reports that students with dyslexia use a range of strategies to overcome those challenges and to improve educational outcomes, including the use of technical assistance, accessing support from dyslexia tutors, putting in additional time, effort and organization.

Our findings are also consistent with earlier studies on reading habits and attitudes towards reading in individuals with dyslexia and the important role that personal interest and motivation play. For instance, the attitudes of poor readers improve through additional reading training that uses reading materials the participants are interested in (Thames & Reeves, 1994). Similarly, individuals with dyslexia who struggle with persistent deficiencies in basic reading skills construct meaning in high-interest domains (Fink, 1995). Furthermore, it is important to note that attitudes towards reading and related reading habits start to develop in childhood, and individuals who receive literacy assistance appear to have more positive attitudes (Maguire, 2015).

The results on comorbidities with dyslexia corroborate previous research, which has also found the presence of anxiety and depression being the most common (Hendren et al., 2018; Margari et al., 2013; O'Byrne et al., 2019), OCD (Darweesh et al., 2020), and dysgraphia and dyscalculia (Wilson et al., 2015). It is possible that the presence of anxiety and depression are the result of difficulties in reading comprehension, but these were not specifically stated in our questionnaire as the focus of the questions probing whether the participant had any comorbidities in addition to their dyslexia diagnosis. Last, fewer than 50% in our sample were diagnosed with a co-existing difficulty, which is consistent with findings in the general dyslexia literature (Margari et al., 2013; Moll et al., 2020).

Limitations and Implications

Some limitations should be taken into account when interpreting the results of the present study. The first refers to our small sample size, which prevents us from making any strong claims or generalizations.

Second, the demographic questionnaire is not a formal, standardized tool for collecting personal information data. Also, we did not collect school report data or teacher report corroboration, nor did we correlate the information participants gave with any observational language measures. Such information would have enabled us to validate participants' information about reading, language experience, and feelings towards their trajectory as individuals with dyslexia.

Last, given that our sample was sourced from a university environment, it is likely that the severity of participants' dyslexia and/or comorbidity diagnosis did not impact their ability to succeed in a higher education setting or that their personal strategies allowed them to succeed. As such, we suspect that high socioeconomic status (SES) may have played an important role in their achievement.

Our results have implications for the educational system. The fact that some individuals with dyslexia have difficulty understanding the wording of a math problem, for example, has direct implications for the classroom as teachers and the school system must be able to assess the specific problem and provide the means so that the learner can receive the correct support. Also, our results suggest that high SES may have influenced the access to education these individuals had had since their childhood and the resulting help they had received with overcoming their reading problems. This points to a possible need for teachers and the school system to assume a more prominent role in the education of low-SES learners, including those with dyslexia. Indeed, research has shown that individuals with reading disabilities with higher economic and social status achieve higher reading scores than those with low SES (Siegel & Himel, 1998). Specifically, higher SES is related to better reading performance and to the quality of the educational environment, such as the school and home environment, including the quality of the linguistic input at home and the parents' reading ability (Peterson & Pennington, 2015).

Conclusions

The aim of the present study was to investigate the self-reported reading difficulties and compensatory strategies of monolinguals and bilinguals with dyslexia. Because of the bilingual advantages reported by other researchers, we hypothesized that there would be differences in the performance of the two groups, favoring bilinguals. Our results did not support this hypothesis, however: There were no clear differences between the two groups in terms of the themes that arose from the data. Important, however, learning a second language can affect the manifestation of dyslexia, as similarities and differences of orthographic features between two languages influence reading proficiency (Abu-Rabia & Sammour, 2013).

The results from our thematic analysis pointed to four recurrent themes in the protocols of both monolinguals and bilinguals: using effective coping strategies to overcome reading difficulties, working harder than their peers to enter university and graduate, the impact of dyslexia on their reading habits, the reading challenges they faced, and comorbidities with dyslexia. It is possible for some individuals with dyslexia to succeed academically and obtain a university degree or a certificate, which may allow them to possibly find job opportunities and have better chances to lead a successful life. Our participants with dyslexia were successful, despite facing challenges that were not experienced by their typical peers, some even having to deal with one or more comorbidities. As already noted, we suggest that achievement might be related to somewhat privileged SES status and the quality of education and home environment.

The present study highlights the everyday struggles that adults with dyslexia continue to have, regardless of when they were diagnosed, whether they received literacy assistance, and whether they learned a second language. Although we were not able to show whether there is a *bilingual* cognitive advantage to having dyslexia, this is an important avenue for future research, particularly for participants with comorbid difficulties.

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