School of Population Health

Faculty of Health Sciences

Understanding Mental Health Concerns among Children with Reading Difficulties

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Declaration

Originality

To the best of my knowledge this thesis contains no material previously published by any other person except where due acknowledgment has been made. Furthermore, this thesis contains no material that has been submitted for any other degree at any university.

Human Ethics

The research presented in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2018). Human research ethics approval from the Curtin University Human Research Ethics Committee (HREC) was obtained for the studies presented in Chapters 3 and Chapter 4 (HRE2021-0084) and Chapter 5 (HRE2020-0168). Approval to recruit through West Australian government schools was provided by the Department of Education Western Australia.

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Journal Articles

Published

1. **Wilmot**, A., Hasking, P., Leitão, S., Hill, E., & Boyes, M. E. (2023). Understanding mental health in developmental dyslexia: A scoping review. *International Journal of Environmental Research and Public Health*, 20 (2), 1653. https://doi.org/10.3390/ijerph20021653

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3. **Wilmot**, A., Pizzey, H., Leitão, S., Hasking, P., & Boyes, M. E.(2023)."I struggle at times to see her struggle": Mothers' perspectives on dyslexia-related school struggles and the inter-connected nature of mother and child wellbeing. *Dyslexia,* 29 (2), 136-150. https://doi.org/10.1002/dys.1733

Under Review

1. **Wilmot**, A., Hasking, P., Leitão, S., Hill, E., Boyes, M. (under review) Understanding mental health in developmental dyslexia through a neurodiversity lens: The mediating effect of school-connectedness on anxiety, depression, and conduct problems.

Conference Presentations

1. **Wilmot**, A., Hasking, P., Leitão, S., Hill, E., Boyes, M (2023, July). *Understanding internalising/externalising mental health concerns among children with dyslexia: A scoping review.* Conference presentation at the 2023 Annual Conference of the Society for the Scientific Study of Reading, Port Douglas, Australia.

2. **Wilmot**, A., Pizzey, H., Leitão, S., Hasking, P., Boyes, M (2023, May). *Child and parent perspectives on dyslexia-related school struggles, self-esteem, and mental health.* Oral Presentation at the 2023 Annual Conference of Speech Pathology Australia, Hobart, Australia.

3. **Wilmot**, A. (2022, September). *Dyslexia and mental health.* Mark Liveris Seminar, Curtin University Faculty of Health Sciences Research Day.

4. **Wilmot**, A. (2023, September). *Dyslexia and mental health: Understanding mental health in developmental dyslexia through a neurodiversity lens.* Mark Liveris Seminar, Curtin University Faculty of Health Sciences Research Day.

Table of Contents

Thesis Abstract

Dyslexia, a neurocognitive difference characterised by poor word-reading, is associated with elevated risk for internalising (e.g., anxiety) and externalising (e.g., conduct problems) mental health concerns. Improving understanding of mental health in developmental dyslexia, specifically, identifying underlying mechanisms, and risk/protective factors for mental health, was the focus of my PhD program of research. Research of this nature is needed to: (a) build theoretical accounts of mental health in developmental dyslexia; (b) identify children who may, or may not, be at risk for mental health concerns; and (c) elucidate targets for tailored mental health programs. To address the research aim, I conducted a scoping review of the literature (Study 1), interviewed those with lived experience – both children and caregivers (Study 2), explored the nature of child-parent relationships in the context of dyslexia and links to mental health (Study 3), and tested the association between dyslexia and mental health concerns via various domains of school-connectedness (Study 4). Each of these studies is described below.

Study 1 – Understanding mental health in developmental dyslexia: A scoping review.

Previous reviews have established the strength and direction of the association between dyslexia and internalising and externalising mental health concerns; but the reasons *why* these associations exist are largely unknown. The aim of Study 1 was to scope the extent and nature of studies exploring factors which may influence the association between dyslexia and both internalising and externalising mental health concerns. In so doing I aimed to identify gaps in the literature and directions for future research. Both quantitative and qualitative literature were included and no limit was set for date. Inclusion criteria included: (a) a focus on childhood (≤18 years) reading/learning difficulties, (b) internalising and/or externalising symptoms, and (c) a potentially modifiable third factor. For this review, 'modifiable' was defined as a skill/attitude/behaviour which could be an intervention target for school-aged children with dyslexia and/or their families and communities. Ninety-eight studies (dating from 1968) met the inclusion criteria. Studies were organised according to whether the third factor under investigation was an individual, family, or community-level factor. Whilst a range of third factors were identified, relatively few researchers tested associations between the third factor and mental health in the context of dyslexia. Furthermore, many past researchers have used broad measures of psychosocial functioning (e.g., total scores on the Strengths and Difficulties Questionnaire) rather than measures of specific mental health concerns (e.g., anxiety), have focused on childhood rather than adolescent experience, and gauged teacher/parent rather than children's own perspectives. Future researchers are

encouraged to address these limitations to improve understanding of underlying mechanisms and/or risk/protective factors for mental health. Such research is needed to help to identify children who are more (or less) at risk of mental health concerns and inform tailored mental health programs for children with dyslexia.

Study 2 – Growing up with dyslexia: Child and parent perspectives on school struggles, self-esteem, and mental health.

The aim of Study 2 was to learn more about the mental health of children with dyslexia by gauging the perspectives of those with lived experience, both children and their caregivers. I recruited 17 children (aged 9 -14 years) and their mothers. Interviews were transcribed verbatim and analysed using Braun and Clarke's reflexive thematic analysis approach within a critical realist/contextualism framework. I prioritised the voices of children and interpreted data through a neurodiversity lens. Three themes were developed to address the research aim. The first theme *Different in a good/bad way* explored: emotional responses to diagnosis; the value of framing dyslexia from a neurodiversity affirming framework (different not deficit); and the effect of school struggles on children's self-esteem. The second theme *Exhausted and overwhelmed* explored: children's school-based emotions (e.g., stress, embarrassment); emotion regulation strategies; and mothers' perceptions of internalising (e.g., anxiety) and externalising (e.g., lashing out) behaviour as a response to school struggles. The third theme, *It takes a community: Family school connections* explored notions of school as a poor 'fit' for children with dyslexia*,* and the importance of positive family-school relationships (school-connectedness) for both mother and child wellbeing. Children's self-esteem and mental health were related to their school struggles. My analysis also highlighted the importance of friendships, parent support, and school-connectedness for the wellbeing of children with dyslexia.

Study 3 – "I struggle at times to see her struggle": Mothers' perspectives on dyslexia-related school struggles and the inter-connected nature of mother and child wellbeing.

The aim of Study 3 was to explore the nature of child-parent relationships in the context of dyslexia and links to mental health (both parent and child mental health). This study used the same sample, data, and analytical processes as Study 2, however, in this study the mothers', rather than children's, voices were prioritised. I developed 5 themes from the data. Theme 1 *Years in the wilderness: Life before diagnosis* explored mothers' perspectives of the diagnostic process and responses to diagnoses. Theme 2 *"I struggle sometimes to see her struggle",* explored mothers' distress at witnessing their child's school-related struggles and worry about their child's present and future situation. Theme 3 *School struggles: Advocating*

for our children and managing distress explored mothers' advocacy role at school and responses to children's school-related distress. Theme 4 *It's a "fulltime job" and a "long slog"* explored the multiple roles mothers had when raising a child with dyslexia. Theme 5 *Care for the carer: Social support and coping strategies* discussed mothers' sense of being isolated and misunderstood, their coping strategies, and the importance of school-connectedness. This study highlighted the interconnected nature of mothers' and children's well-being. Perceptions of school connectedness, and a neurodiversity mindset characterised by acceptance, focusing on strengths, and having non-stigmatising attitudes to dyslexia may be protective of mother and child well-being. When mothers feel that they (and their children) are understood, respected, and treated fairly at school, whole families benefit.

Study 4 -Understanding mental health in developmental dyslexia through a neurodiversity lens: The mediating effect of school-connectedness on internalising and externalising symptoms.

Findings from Study 1 and Study 2 highlighted school-connectedness as a plausible mediator of the association between dyslexia and mental health concerns. The aim of Study 4 was to test this hypothesis. Two hundred and eighty-three primary school children (87 with dyslexia) and a corresponding caregiver (95.4 % mothers) completed a battery of well-validated connectedness and mental health measures. Two mediation models (one for child-report and one for caregiver-report) tested direct and indirect effects of dyslexia on anxiety, depression, and conduct problems via teacher, peer, friend, and school-connectedness. After controlling for children's gender and having another neurodevelopmental condition (e.g., ADHD) there were no direct effects of dyslexia on child or caregiver-reported internalising symptoms or child-reported conduct problems. However, dyslexia was associated with both child and caregiver reported anxiety, depression, and conduct problems via lower levels of school (but not teacher, friend, or peer) connectedness. Findings highlight school-connectedness as an important protective factor for the mental health (both internalising and externalising) of children with dyslexia. Future research testing associations between dyslexia, school-connectedness, and mental health over time is needed.

To the best of my knowledge, no previous research has investigated mental health in the context of developmental dyslexia through a neurodiversity lens. In doing so, my research has highlighted a need for researchers and clinicians to focus mental health intervention at the community and family level, in addition to supporting children's own socioemotional skills. In particular, children's school struggles, academic self-esteem, and school-connectedness were highlighted as potential intervention targets for future research in this area.

Author's Note

My researcher positionality

I commenced this PhD knowing very little about childhood reading difficulties. However, I had been working as a research assistant in the autism field and have family members with autism. When I first started reading autism research 18 years ago, the medical model, which pathologised autism, was prevalent. I did not recognise my loved ones in the descriptions provided and hence we did not pursue diagnosis. Furthermore, I was concerned about a stigmatising label (as I believed it to be at that time) being given to people I cared about.

Since that time, autistic people[1] have begun using social media and other forms of communication to tell a different story of autism; one which highlights strengths and challenges. This version of autism resonated with my friends and family members and some, but not all, decided to pursue diagnosis. Once I asked one of my children if they wished I hadn't suggested that they may be autistic, and they responded, "I'm glad you did, if I didn't know I was autistic then I would think there was something wrong with me". Clearly, the neurodiversity perspective was taking effect; my child did not consider that there was anything 'wrong' with being autistic at all. This is not to say that autism does not present challenges, it certainly does. It's like being left-handed in a world set up for right-handed people. Sometimes you learn to do things right-handed just to get by, but it's not the way your brain is wired, and it takes a lot more effort.

Early in my PhD I read Uta Frith's reflections about autism and dyslexia after 25 years of working as a researcher in both fields (Frith, 2013). In this reflection, she argues that both autism and dyslexia need to be considered lifelong conditions because they have neurocognitive underpinnings, that can be compensated for, but remain unchanged. A child with dyslexia can learn to read but are they still dyslexic? Yes, according to Frith they are. This understanding of dyslexia is in keeping with that of many of the families I interviewed as part of my PhD program of research. Many regarded dyslexia as much more than 'just' reading difficulties. They highlighted both the strengths of their children with dyslexia and the co-occurring difficulties, such as difficulties with oral language, and

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[1] When describing autistic people I use identity-first language (i.e., autistic person rather than person with autism) in this thesis as it has been confirmed to be the preference of most autistic people (Kenny et al., 2016). However, the conversation of preferred language has not yet been undertaken with the dyslexic community as far as I am aware. I have chosen to use person first language (i.e., person with dyslexia) in this article however I would always recommend asking an individual about their preferred language.

organisational/planning skills (i.e., executive functioning). Many described their dyslexia as meaning that they had a 'different' kind of brain which needed a 'different' approach to learning, consistent with a neurodiversity perspective. Dyslexia was the preferred term of the families I interviewed and is consistent with a neurodiversity perspective. For these reasons, I use the term dyslexia instead of 'reading difficulties' in my thesis, even though it is a controversial term among some researchers in the field.

The neurodiversity paradigm informed both my interpretation of data and conclusions drawn. It is impossible for me to separate who I am as a person and who I am as a researcher; and it's important to be transparent. I'm personally grateful to autism advocates who stood up to cry 'nothing about us without us.' I'm grateful to the researchers who listened. The neurodiversity paradigm made an enormous difference to my family, and, in my opinion, transformed autism research for the better. I hope that it can shape research in the dyslexia field in the same way.

A guide on how to read this thesis

This thesis is a hybrid of published articles (Studies 1-3), one article currently under review (Study 4), and additional commentary. I have made changes to referencing, formatting, spelling, punctuation, and grammar to the published articles to be consistent across the thesis. I have also provided some additional description where needed to enhance the readability of the thesis. Other than this, the published articles remain unchanged. The background and rationale of each article is similar which means there is some unavoidable repetition across chapters. To avoid further repetition, I have combined references for all the chapters at the end of my thesis. As Study 1 is a scoping review of the literature, I do not provide a separate narrative review at the beginning of the thesis, but rather an introduction to the field. I have used the pronoun "we", in the articles and some linking content in recognition of shared authorship. The pronoun "I" is used in sections reflecting my own ideas. Furthermore, direct quotes from participants are italicised and appear in quotation marks. Italicisation outside of quotation marks is used for emphasis. All tables and figures are labelled by their chapter number, followed by the order number of the figure or table. For example, for Chapter 2, tables and figures are numbered 2.1, 2.2 etc). I have provided a list of figures on page 15, a list of tables on page 16, and a list of appendices on page 17 of my thesis.

List of Figures

List of Tables

List of Appendices

Chapter 1:

Dyslexia, mental health, and the neurodiversity paradigm

In this chapter I provide an overview of the context for my PhD within the broader field of dyslexia research generally, and dyslexia and mental health research specifically. I then introduce the neurodiversity paradigm and situate my research within this framework.

Dyslexia – a historical perspective

Throughout this thesis I have used the definition of dyslexia provided by the West Australian Dyslexia-SPELD Foundation. This definition is consistent with diagnostic criteria and states that dyslexia is "characterised by difficulties with accurate and fluent word reading, poor spelling, and decoding abilities that do not progress as expected with the provision of well-intentioned and targeted intervention" (Dyslexia-SPELD-Foundation, 2022a). The Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5; (American Psychiatric Association (APA), 2013) has a category for dyslexia within the Specific Learning Disorders (SLD); a category that also includes dysgraphia (difficulties with writing) and dyscalculia (difficulties with mathematics). Specific Learning Disorders are listed under the umbrella of Neurodevelopmental Disorders alongside conditions including autism, language disorder, and Attention Deficit Hyperactivity Disorder (ADHD). These are grouped together in recognition of the fact that they are: (a) neurocognitive in origin, (b) present during childhood, and (c) considered to have functional impacts on children's development (APA, 2013).

Historically, dyslexia was thought to reflect a problem with visual processing and referred to as 'word-blindness'(Kirby, 2020). Now, dyslexia is generally regarded as a language-based disorder (see for example, Adlof & Hogan, 2018). Specifically, dyslexia is associated with a 'phonological deficit' meaning a deficit in the ability to represent, store, and retrieve speech sounds which makes it difficult to match sounds to letters when learning to read (Castles et al., 2010; Snowling et al., 2019; Snowling et al., 2020). Consistent with this account, oral language difficulties in early childhood are a frequent precursor to dyslexia (Snowling & Melby-Lervåg, 2016; Snowling et al., 2021) and difficulties in *both* the oral and written (reading, spelling, writing) domains of language often co-occur across the lifespan (see for example, Adlof & Hogan, 2018). Despite the strength of this explanation for dyslexia, phonological deficits cannot account for all instances of dyslexia nor the frequent co-morbidity between dyslexia and other neurodevelopmental conditions such as ADHD

(Pennington, 2006; Snowling et al., 2020). So, multiple deficits rather than a single (i.e., phonological) deficit are believed to contribute to a child meeting the threshold for dyslexia (Pennington, 2006; Snowling et al., 2020; Thompson et al., 2015) and gene-environment interactions to contribute to its aetiology (Hendren et al., 2018).

Dyslexia and mental health

Much research in the dyslexia field has focused on improving understanding of the cognitive underpinnings of dyslexia to inform evidence-based reading remediation (see for example the following reviews, Castles et al., 2010; Hulme & Snowling, 2013a). However, there is increasing interest in understanding mental health in the context of developmental dyslexia (Boyes et al., 2016, Hendren et al., 2018; Livingston et al., 2018). When interviewed, educators and parents express concern for the mental health of children with dyslexia (Claessen et al., 2020; Leitão et al., 2017; Riddick, 2010) and adults describe how childhood reading difficulties can cast a long shadow on their mental health (Nalavany et al., 2011). Consistent with these accounts, recent meta-analyses have established robust associations between poor reading and both externalising (e.g., 'behavioural problems' such as aggression) and internalising (e.g., 'emotional difficulties' such as anxiety) symptoms, using measures which assess generalised externalising and/or internalising symptoms as well as measures of specific mental health concerns such as anxiety (Donolato et al., 2021; Francis et al., 2019). Taken together, the findings of this research suggest that mental health concerns among children with dyslexia can extend beyond the classroom into their everyday life and may persist into adulthood.

Despite the strength of these findings, the reasons *why* associations between poor reading and internalising/externalising mental health concerns exist are still largely unknown (Boyes et al., 2016; Francis et al., 2019). A recent meta-analysis found that the severity of reading difficulty and/or the gender, age, and IQ of the child did not moderate associations between reading difficulty and externalising/internalising symptoms (Donolato and colleagues, 2021). In terms of externalising symptoms, there is some evidence that children's attentional difficulties or comorbid ADHD may account for the associations (Carroll et al., 2005; Horbach et al., 2020; Maughan & Carroll, 2006). However, internalising symptoms in developmental dyslexia appear to have environmental rather than genetic causes and are *preceded* by reading difficulties (Jordan & Dyer, 2017; McArthur et al., 2022; Whitehouse et al., 2009); this suggests that internalising symptoms may occur as a secondary consequence of reading difficulty and/or the school struggles that often co-occur with dyslexia. Taken together, these findings highlight the importance of investigating individual, family, and

community level risk/protective factors for mental health in the context of developmental dyslexia. Addressing children's reading difficulties may not be sufficient to support their mental health (Roberts et al., 2020). Furthermore, dyslexia is a lifelong condition (Frith, 2013; Maughan et al., 2020), so, mental health programs as an adjunct to reading remediation is indicated. Such an approach may optimise mental health during childhood and beyond.

Dyslexia, mental health, and Bronfenbrenner's socioecological model

My PhD program of research is grounded in the foundational work of members of my supervisory team. Informed by Bronfenbrenner's (1979) socioecological model, they explored individual, family and community-level risk/protective factors for mental health by: (a) interviewing educators (Claessen et al., 2020) (b) interviewing children with dyslexia and their parents (Leitão et al., 2017), and (c) analysing data from the case files of 454 children with a confirmed dyslexia diagnosis (Boyes et al., 2019). Bronfenbrenner's socioecological model (see Figure 1.1 below) acknowledges that interactions between a child and their environment (e.g., school, community, values, history) influence their development and wellbeing. Resources at one level of a child's context (e.g., supportive parents) may buffer against shortcomings at another level (e.g., a lack of mental health services).
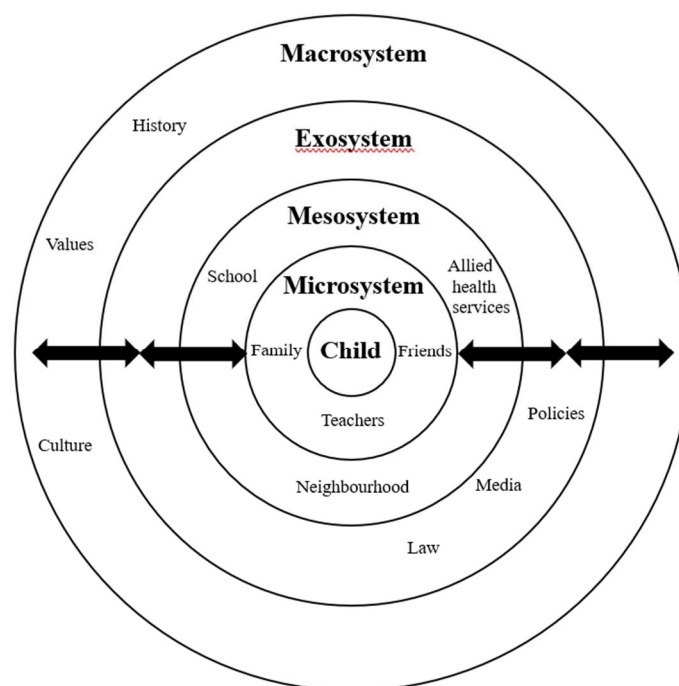
Figure 1.1: A version of Bronfenbrenner's (1979) socioecological model

Two of these studies highlighted that mental health in developmental dyslexia needs to be understood within children's sociocultural context (Claessen et al., 2020; Leitão et al., 2017). Specifically, that children with dyslexia grow up in a society which "privileges

perceived ability" (Leitão et al., 2017, p. 322) and in which their perceived difference may be associated with shame (Claessen et al., 2020). The case-file study found that social skills, peer problems, bullying victimisation, emotion regulation and self-esteem were salient correlates of externalising and internalising mental health concerns among children with dyslexia (Boyes et al., 2019). However, the findings of this study were limited because well-validated measures of the hypothesised risk/protective factors were not available (Boyes et al., 2019). Furthermore, only the study by Leitão and colleagues (2017) gauged children's own perspectives on dyslexia and mental health. This is a limitation given that internalising syptoms and some social difficulties (e.g., bullying) may be difficult for an outsider to accurately assess.

The neurodiversity paradigm

I brought a neurodiversity lens and interest in autism research to build on the foundational research of my supervisors, described above. Australian autistic sociologist Judy Singer is credited with coining the term 'neurodiversity' in 1998 with it first appearing in print in the same year in a newspaper article by American journalist Harvey Blume (Blume, 1998; Singer, 1998). Neurodiversity refers to a belief that differences in human neurodevelopment reflect natural human variation (akin to the term biodiversity as it relates to the non-human world) to be accepted, respected and/or celebrated rather than pathology to be 'cured' (see for example, Blume, 1998; Baron-Cohen, 2017; den Houting, 2019; Pellicano & den Houting, 2021; Singer, 1998). Thus, the neurodiversity paradigm is often situated in contrast to the medical model which conceptualises variations in neurodevelopment, such as autism or dyslexia, as disorders characterised by developmental delays or deficits (DSM-5; APA, 2013).

Some people conceptualise neurodiversity as a biological fact (i.e., that humans vary in their neurodevelopment); for others, neurodiversity is an ideology (Ne'eman & Pellicano, 2022). As an ideology, neurodiversity has been a vehicle for autistic/neurodivergent[2] self-advocacy aligned with the broader disability rights movement (Ne'eman & Pellicano, 2022). Specifically, the neurodiversity paradigm is consistent with the social model of disability; proponents of this model argue that people are not disabled by factors within themselves (i.e., the fact that someone needs to use a wheelchair; an individual/medical model) but rather they are disabled by a society that does not cater for their difference (e.g., a building that does not

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[2] I use the definition provided by Pellicano & Den Houting (2021) which defines neurodivergent as referring to "a person or people whose neurodevelopment falls outside of (or 'diverges' from) the range usually considered to constitute 'typical' development" (p. 6; Pellicano & Den Houting, 2021).

provide a wheelchair ramp; a social model; Oliver, 2013; Pellicano & den Houting, 2021; Riddick, 2001). The focus of neurodiversity advocacy, therefore, is on promoting awareness and acceptance of neurodiversity *and* creating supportive environments to promote health and wellbeing (see for example, den Houting, 2019). However, strengths-based approaches to support children with their challenges (e.g., language/reading difficulties) are consistent with a neurodiversity perspective (i.e., capacity building rather than deficit remediation; den Houting, 2019; Kapp et al., 2013; Rappolt-Schlichtmann et al., 2018).

From a neurodiversity perspective, the medical model of science is critiqued for being deficit-focused, ignoring lived experience perspectives, and, overly individualistic; focusing change at the individual-level without due consideration of the social and environmental factors that influence people's lives (Pellicano & den Houting, 2021). In this regard, the neurodiversity paradigm is consistent with Bronfenbrenner's socioecological model in which mental health is considered to reflect an interaction between the child and their environment. However, from a neurodiversity perspective, there is also an awareness that neurodivergent people are often expected to function in environments, such as schools and workplaces, which are poor fit for their strengths and challenges (Johnson., 2023; Mandy, 2022) and that this poor fit may be detrimental to their mental health (Mandy, 2022).

Adopting the neurodiversity paradigm/social model of disability in autism research has promoted new knowledge regarding mechanisms for mental health concerns. For example, there is now an awareness of the role that camouflaging/masking autistic traits (such as hand-flapping or forcing uncomfortable eye contact) to fit in to an unaccommodating 'neurotypical'[3]world may be a risk factor for burnout, depression, and anxiety among autistic adults (see for example, Higgins et al., 2021; Hull et al., 2021; Phung et al., 2021). I wondered if a neurodiversity perspective would facilitate greater understanding of the reasons *why* children with dyslexia are at elevated risk of mental health concerns.

Since I commenced my PhD I have become aware of increasing support for understanding dyslexia as neurodiversity (see for example, Johnson., 2023). In another example, the British Dyslexia Association (2023; as seen on their website) now takes a neurodiversity perspective to dyslexia. Adopting neurodiversity-affirming practice is described as a moral imperative by lived experience occupational therapists (Dallman et al., 2022) and an important "shift of mind-set" for speech language pathologists (Rappolt-

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[3] I use the definition provided by Pellicano & Den Houting (2021) which defines neurotypical as referring to "a person or people whose neurodevelopment falls within the range usually considered to constitute 'typical' development" (p. 6; Pellicano & Den Houting, 2021).

Schlichtmann et al., 2018, p. 864). If one conceptualises dyslexia as 'just' reading difficulties, then it may be difficult to see how the neurodiversity paradigm applies. However, for many with lived experience, dyslexia extends beyond difficulties with reading (Wilmot et al., 2023b) and is an accepted and integrated aspect of their identity (see for example, Johnson., 2023; Wilmot et al., 2023a). Taking a neurodiversity lens to developmental dyslexia implies that research and intervention should focus on: (a) recognising and building children's capacity by supporting their challenges *and* recognising their strengths, (b) understanding dyslexia as identity, and (c) identifying and modifying changes at the environmental level to support learning and mental health (see for example, Hogan, 2018; Johnson, 2023; Rappolt-Schlichtmann et al., 2018; Wilmot et al., 2023a). From a neurodiversity perspective, mental health concerns may occur if one or more of these factors are not in place.

My PhD research program: Mental health in developmental dyslexia from a neurodiversity perspective

Taking a neurodiversity lens to my PhD influenced the methods chosen (i.e., an emphasis on lived experience), the selection of factors that I chose to investigate (i.e., school-connectedness as a measure of child-school 'fit'), as well as my interpretations of results. Chapter 2 (Study 1) of this thesis contains a scoping review of literature exploring factors at the individual, family, and community-level which may influence mental health in the context of developmental dyslexia. This was the foundational study of my PhD program of research. This review has been published in the *International Journal of Environmental Research and Public Health.* Chapter 3 (Study 2) and Chapter 4 (Study 3) of my thesis are articles developed from interviews with 17 children with reading difficulties (16 with a confirmed dyslexia diagnosis) and their mothers. During the interviews I explored children's strengths and challenges and learned how some families were framing dyslexia from a neurodiversity perspective to support self-esteem. During the analysis, I developed themes regarding the inter-connections between children's and mothers' mental health, the nature of parent support in the context of dyslexia, and the importance of school-connectedness. These articles have been published in the journal *Dyslexia*. Through conversations with families (Study 2 and Study 3), and informed by a neurodiversity perspective, I developed a hypothesis regarding school-connectedness as a mechanism underlying links between dyslexia and internalising/externalising mental health concerns. This hypothesis was tested in Chapter 5 (Study 4) of my PhD. This article (Chapter 5) is currently under review at an international journal. Chapter 6 concludes the thesis and comprises a general discussion of key findings and both theoretical and clinical/educational implications. I also outline key

limitations of the research program and directions for future research, before finishing the thesis with concluding remarks.

Chapter 2

Understanding mental health in developmental dyslexia: A scoping review.

The following scoping review was the foundational study of my PhD research program. It has been published open access (citation below). The aim of the review was to scope the extent and nature of studies exploring factors which may influence the association between dyslexia and internalising/externalising mental health concerns. In so doing I aimed to identify gaps in the literature and directions for future research. As I take a neurodiversity lens to my research, I scoped studies that explored factors at the family (e.g., parent-child relationship) and community (e.g., school connectedness) level in addition to factors at the individual-level (e.g., coping strategies) of children's experience. I was also interested in investigating the balance of studies investigating the strengths and challenges of children with dyslexia. Taking such an approach builds on the work of researchers in my supervisory team who have studied mental health in developmental dyslexia from a socio-ecological model (Bronfenbrenner, 1979) see for example (Boyes et al., 2019; Leitão et al., 2017). Bronfenbrenner's model acknowledges the significance of a child's environment (e.g., family, school, wider community, and political processes) and their interactions within these environments to their development and wellbeing. The review included 98 studies and identified 26 modifiable third factor categories that may influence mental health in the context of developmental dyslexia. Supplementary materials for this study are included in Appendix A-E. A data extraction table (including references) for all 98 studies is included in Appendix E. Each study in Appendix E has a number which correlates with the numbers in Table 2.1 of this thesis. In the published article the study numbers in Table 2.1 were cross-referenced with the MDPI referencing system and are therefore different to those which appear in this thesis. This version of the table can still be accessed via the link to the article below.

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Attributions

Author	Contribution	Acknowledgement
Adrienne Wilmot	Developed the research question and methodology; prepared the proposal; managed the source selection process; conducted the analysis and interpretation of data; prepared the manuscript	
Penelope Hasking Suze Leitão Lizz Hill Mark Boyes	Assisted with development of the research question and methodology (e.g., inclusion/exclusion criteria); participated in the source selection process; assisted with the preparation of the proposal and manuscript	

Abstract

Children with dyslexia are at elevated risk of internalising and externalising mental health concerns. Our aim was to scope the extent and nature of the literature investigating factors which may influence this association. We systematically searched the peer-reviewed and grey literature with no restrictions on the date. We included both qualitative and quantitative studies. Inclusion criteria included: (a) a focus on childhood (≤18 years) reading/learning difficulties, (b) internalising and/or externalising symptoms, and (c) a potentially modifiable third factor (e.g., self-esteem). Ninety-eight studies met the inclusion criteria. We organised the studies according to individual, family, and community-level third factors. Whilst a range of third factors were identified, relatively few researchers tested associations between the third factor and mental health in the context of dyslexia. Furthermore, there was a focus on primary rather than secondary school experience and a reliance, in many cases, on teacher/parent perspectives on children's mental health. Future researchers are encouraged to explore links between socio-emotional skills, coping strategies, school connectedness, and mental health in the context of dyslexia. Research of this nature is important to assist with the identification of children who are more (or less) at risk of mental health concerns and to inform tailored mental health programs for children with dyslexia.

Keywords: dyslexia, reading difficulties, mental health, internalising, externalising

Introduction

Dyslexia is characterised by difficulties with accurate and fluent word reading and poor spelling and decoding abilities that do not progress as expected with the provision of well-intentioned and targeted intervention (DSF; Dyslexia SPELD Foundation, 2022a). Importantly, dyslexia is not related to more generalised cognitive difficulties or sensory deficits, rather, the difficulties are thought to stem from neuro-cognitive differences in the way speech sounds are processed (McArthur & Castles, 2017; Snowling et al., 2019). Consistent with this account, oral language difficulties in early childhood are a frequent precursor to dyslexia (Hulme & Snowling, 2013b) and difficulties in both the oral and written (reading, spelling, writing) domains of language often co-occur across the lifespan (Bishop & Snowling, 2004; Snowling & Melby-Lervåg, 2016; Tomblin et al., 2000). Furthermore, dyslexia is frequently associated with other learning and attentional difficulties that are believed to share genetic risk factors and/or underlying cognitive differences (Becker, A.L., et al., 2017; Snowling et al., 2020).

The Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5; American Psychiatric Association, 2013) has a category for dyslexia within the Specific Learning Disorders (SLD); a category which also includes dyspraxia (difficulties with writing) and dyscalculia (difficulties with mathematics). It is difficult to estimate prevalence rates for dyslexia as many children remain unidentified. Nevertheless, it is generally believed that 5-10% of children experience severe and persistent word reading difficulties consistent with dyslexia; a figure which equates to approximately 2-4 children in an average-sized classroom (Claessen et al., 2020; McArthur & Castles, 2017).

Academic and Psychosocial Correlates to Dyslexia

Dyslexia can negatively affect children's motivation to read (Morgan & Fuchs, 2007), vocabulary acquisition, and reading comprehension. These skills are important for higher level learning and more complex academic content as the school years progress. Qualitative accounts suggest that children with dyslexia are often aware of the extra effort they need to put into their studies to achieve at comparable levels to their peers (Gibson & Kendall, 2010; Leitão et al., 2017). Similarly, longitudinal evidence suggests that many, but not all, experience relatively poor educational and occupational outcomes (Maughan et al., 2020; Smart et al., 2017). Furthermore, those who live and work with children with dyslexia frequently report concern for children's mental health (Claessen et al., 2020; Leitão et al., 2017; Riddick, 2010). Indeed, there is considerable evidence to suggest that dyslexia is associated with a range of psychosocial difficulties in childhood including: reduced academic

self-concept (McArthur et al., 2020), poor reading self-efficacy (Carroll & Fox, 2017), and elevated levels of internalising (e.g., anxiety) and externalising (e.g., aggression) symptoms indicative of poor mental health (Francis et al., 2019; Maughan & Carroll, 2006; Mugnaini et al., 2009). Taken together, these findings suggest that the mental health concerns of children with dyslexia can extend beyond the classroom into their everyday lives and may persist into adulthood. Understanding *why* children with reading difficulties, such as dyslexia, are at elevated risk of mental health concerns is now a stated research imperative (Boyes et al., 2016; Francis et al., 2019).

The Current Review

The aim of the current review was to scope the extent and nature of the literature investigating factors which may influence the association between childhood dyslexia and internalising and externalising mental health concerns. In so doing, we aimed to identify gaps in the literature and use the findings of the review to inform decisions about directions for future research. Such research is needed to: (a) identify children who may be more (or less) at risk of mental health concerns, and (b) inform tailored mental health programs. Given this aim, a scoping rather than a systematic review was indicated. For the purpose of this review, mental health concerns are defined according to an internalising/externalising dichotomy (Achenbach, 1966), which is widely used in the child development literature and clinical settings. Internalising refers to expressions of emotional distress which are inwardly focused (e.g., withdrawal) whilst externalising refers to expressions of emotional distress which are outwardly focused (e.g., aggression).

A preliminary search for existing reviews and meta-analyses on this topic was conducted in April 2021 using the following databases: Prospero, Cochrane Database of Systematic Reviews, JBI Evidence Synthesis, Campbell Collaboration, and the Open Science Framework. We were unable to find any planned or existing reviews with the same focus as ours. Previous reviews have focused on investigating the strength and direction of the relationship between learning/reading difficulties and internalising symptoms (Francis et al., 2019; Mugnaini et al., 2009; Nelson & Harwood, 2011) or learning difficulties and both internalising/externalising symptoms (Donolato et al., 2021). Another review by Haft and colleagues (2016) offered an excellent preliminary discussion of protective factors for socio-emotional resilience in the context of developmental dyslexia but did not comprehensively search the literature of the time. Our review therefore offers an extension to the existing field.

We came to an a priori decision to present our findings using the three-tiered framework of: (a) individual, (b) family, and (c) community-level factors developed by Haft

and colleagues (2016) and applied previously in research on dyslexia and child mental health (Boyes et al., 2019). This framework acknowledges that children's mental health is influenced by a range of factors that relate to the child themselves (the individual), their family, and the communities in which they participate.

Materials and method

Our review was informed by the Joanna Briggs Institute (JBI) guidelines (Peters et al, 2020) and the PRISMA extension for scoping review checklist (Tricco et al., 2018) which build on Arksey and O'Malley's (2005) foundational work on scoping review methodology. A protocol for the review was registered on the Open Science Framework on 04.05.2021 and is available to view at https://osf.io/gz98x. Changes to the protocol that were applied during the review process are described in Appendix A.

Inclusion/Exclusion Criteria

Types of studies. Peer-reviewed primary research studies as well as theses/dissertations were considered for inclusion. When the same research was reported in a dissertation and journal article then the dissertation was excluded. No limits by date were set. Books, book chapters, study protocols, theoretical/opinion pieces, and previous reviews were excluded.

Population. Sources that included children (≤18 years) or adult perspectives (e.g., teachers, parents, or adult retrospective studies) on children's mental health were considered so long as the child participants spoke an alphabetic language and were not being tested in a language other than their primary language.

Concept 1: Reading difficulties. Sources were included if they investigated internalising and/or externalising symptoms among children with recognised learning difficulties and/or word reading difficulties consistent with dyslexia. In keeping with DSM-5 diagnostic criteria, when the learning difficulties could be better explained by medical (e.g., hearing loss), neurodevelopmental (e.g., autism, intellectual disability), or socio-cultural factors (e.g., child poverty, second language learners, lack of educational opportunity) sources were excluded (APA, 2013).

Concept 2: Mental health. Mental health concerns were defined as consisting of both/either internalising or externalising symptoms. Sources which used global measures of psychosocial functioning with sub-scales to measure internalising/externalising symptoms (e.g., Strengths and Difficulties Questionnaire (SDQ); Goodman, 1997), as well as those which measure a particular aspect of internalising/externalising symptoms (e.g., anxiety) were included. For qualitative research, self/parent/other description of emotional difficulties or mental health concerns were sufficient for inclusion.

Concept 3: Third factor. Sources were only included if they investigated a modifiable 'third factor' in association with mental health concerns among children with learning/reading difficulties. By modifiable we are referring to a skill/attitude/behaviour (e.g., emotion regulation) which could become an intervention target for mental health programs designed for school-aged children with reading difficulties and/or their families and communities. For this reason, sources which solely investigated factors which are intractable (e.g., a child's age); factors which cannot be modified once a child has reached primary school age (e.g., exposure to environmental toxins in-utero); or cognitive differences that may be difficult to modify (e.g., working memory, attention) were not included.

Context. Sources were not excluded based on geographical factors, the educational context of the children (e.g., mainstream, or specialised school), or whether children were receiving educational support or socio-emotional or reading intervention.

Search Strategy

An initial set of search terms were developed by the research team based on their current understanding of the literature. A 3-step search strategy was then followed as recommended by the JBI (Peters et al., 2020, p. 418). At the first stage, the first author conducted a preliminary search of two databases (Scopus and ProQuest) on 10.06.2021. Based on the subject headings and keywords from relevant sources found in this preliminary search, an additional 4 keywords were added to the search terms (Appendix B).

The first author then conducted the second stage of the search on 11.07.2021 with an update on 17.05.2022. This included a search by subject heading and keyword of the OVID platform databases: Embase, PsychInfo, and OVID Medline, and a search by keyword on Scopus, ProQuest and CINHAL. Limits were set for English language and to peer-reviewed journals (where possible). The first author then conducted a search for dissertations/theses using the same keywords via the ProQuest Dissertation and Thesis database. See Appendix C for an example of a complete search of one database, PsychInfo. For the third and final stage of the selection process, the first author reviewed the reference lists of key sources and relevant reviews. An additional 8 sources were located at this stage.

Source Selection

A total of 10,810 sources (10,155 articles and 655 theses) were downloaded into Endnote (Endnote team, 2013) and duplicates removed by the Endnote de-duplication process and by hand. This resulted in a total of 7,389 sources (6,840 articles and 549 theses) being considered by title or title/abstract from the database search (a further 8 sources were added at a later stage from the third stage of the search). At this stage, a source selection tool (see

Appendix D) was developed and piloted by each member of the review team on a random selection of 25 sources. No one reviewer achieved less than 88% agreement with the first author and 4 members of the review team of 6 achieved 100% agreement with the first author. After this pilot, no changes to the subject headings or keywords of the search were considered necessary. However, the source selection tool was adjusted through team discussion to add further explanation and examples to aid the selection process. Throughout the source selection process, we further refined the inclusion/exclusion criteria as outlined in Appendix A.

Following this, a random sample of approximately 20% of sources was independently reviewed by two members of the review team (the first author and one other) by title and/or title/abstract. An inter-rater agreement of 88.6% was achieved. This was considered a satisfactory level of adherence to the selection criteria by the first author who then proceeded to select sources for consideration from the remaining 80% of total sources. Disagreement between reviewers was resolved by consensus by two members of the review team.

A similar process was followed for the next stage of the selection process; selection for inclusion/exclusion based on full text review. Approximately 20% of sources were independently screened by two members of the review team (the first author and one other; inter-rater agreement of 82%) and the remainder was reviewed by the first author alone. Disagreements between authors, and/or any uncertainty by the first author, were resolved by group consensus. A record of the number of sources included/excluded at each stage of the source selection process and the reasons for exclusion are included below in Figure 2.1.

Data Extraction

A data extraction form for this review was adapted from models presented by the JBI manual and other authors (Arksey & O'Malley, 2005; Peters et al., 2020) and developed with input from 3 members of the research team. The first author extracted the relevant data from each source and the fourth author (EH) checked the data extraction of 20% of sources. Based on EH's review, one source was excluded and the participant details of another were corrected.
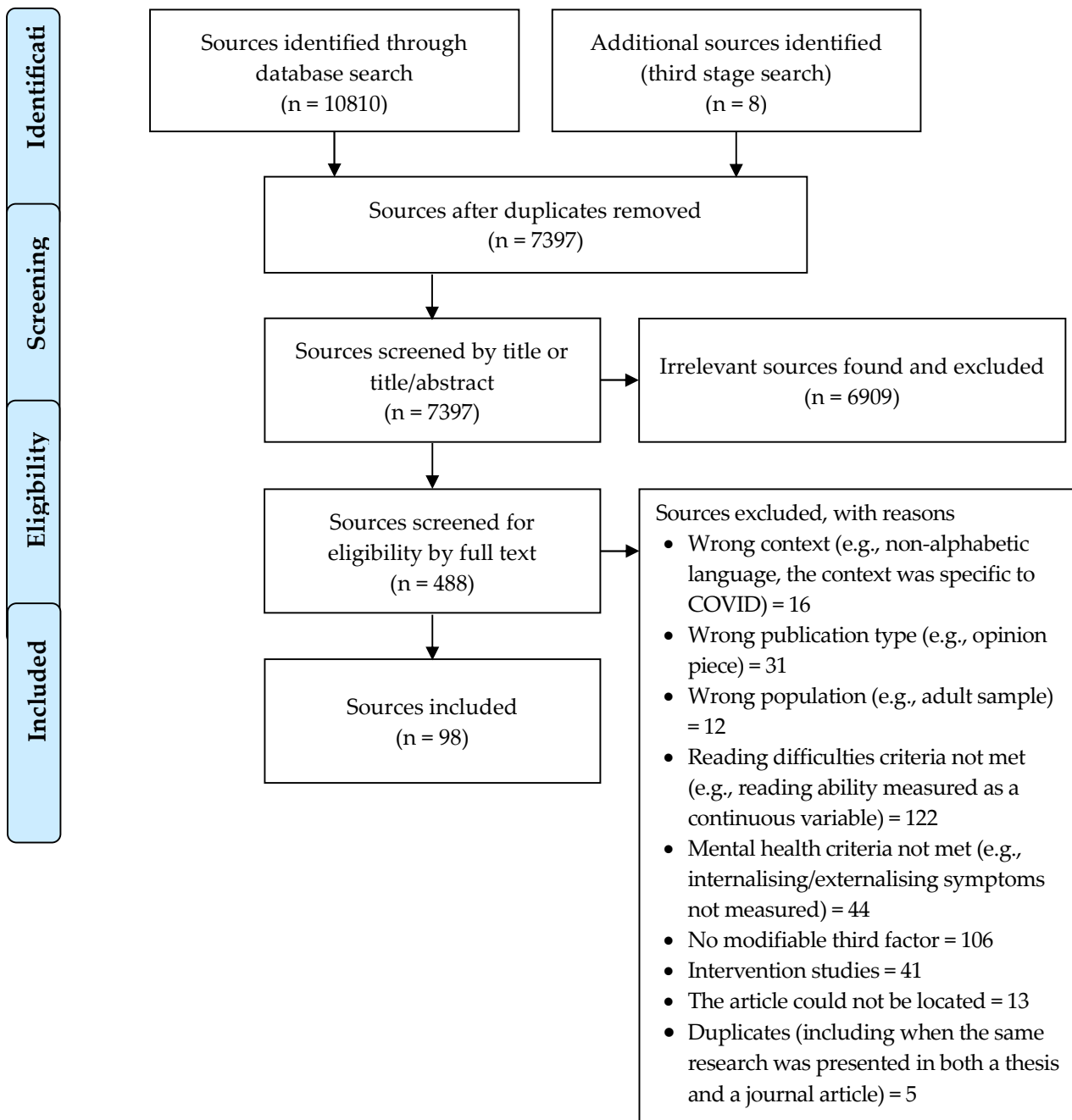
Figure 2.1: PRISMA flow diagram

Results

A total of 98 studies (12 theses and 86 peer-reviewed journal articles) met the inclusion criteria. Geographically, the scope of the studies was widespread. A total of 20 countries were represented; the largest numbers of studies originated from the USA (32), Italy (11), United Kingdom (10), and Israel (7). One study was a cross-cultural analysis of children's mental

health and coping strategies and included participants from Germany and Indonesia (Novita et al., 2019). In terms of design, nine studies were qualitative, 10 incorporated a mixed methods approach, and the remainder were quantitative by design, incorporating either a longitudinal (21 studies) or cross-sectional (58 studies) approach. One of the longitudinal studies was a secondary analysis of four longitudinal studies from English speaking countries (McArthur et al., 2022) .

Sampling Characteristics

Approximately one quarter of the included studies (27 studies; 27.5%) were not dyslexia specific, that is the researchers conducted their investigations using samples of children/adolescents with learning difficulties without specifying sub-type (reading, writing, mathematics difficulties) or specified that the children all had a diagnosis of SLD mixed-type (difficulties in at least two domains of reading, writing, and/or mathematics; see for example, Operto et al., 2021). Researchers of the remaining 71 studies focused on developmental dyslexia or word reading difficulties consistent with a dyslexia diagnosis. A wide range of methods were used to determine group status, ranging from self-identification of reading difficulties (see for example, Speers, 2019), to extensive diagnostic and validation measures, (see for example, Giovagnoli et al., 2020). Furthermore, the severity of dyslexia (when reported) ranged from mild (Casey et al., 1992) to severe (Dahle et al., 2011).

Sample sizes ranged from one (a case study; DeBrew, 2017) to a study incorporating findings from four databases totalling 23,799 children (McArthur et al., 2022). In terms of the age and the stage of development of participants, the researchers of 46 studies focused exclusively on primary school-aged children (≤12 years; 46 studies); 17 on adolescents (≥12 years); and 27 included samples of young people whose ages ranged across these developmental periods (childhood–adolescence). Of the remainder, there were four longitudinal studies in which children were tracked from their primary to secondary school years (Horbach et al., 2020; Maughan et al., 2003; Smart et al., 2019; Willcutt et al., 2007), three studies in which adults were interviewed about their childhood experiences with dyslexia, (see for example, Hughes & Dawson, 1995); and one study in which educators of children with dyslexia aged 5-18 years were interviewed (Claessen et al., 2020). In many of the longitudinal studies the researchers stopped assessing children in the primary school years (see for example, Aitken et al., 2020; Jordan & Dyer, 2017; Kempe et al., 2011; Lin et al., 2013; Mahdavi, 2017; McArthur et al., 2022; Morgan, 2012; Morgan et al., 2008; Parhiala et al., 2015; Russell et al., 2015; Sainio et al., 2019; Turunen et al., 2019).

Study Aims and Mental Health

There was great variety with regard to the aims of the included studies. For example, some researchers primarily aimed to investigate the relative contribution of SLD or attentional difficulties (e.g., co-morbid ADHD) in explaining internalising/externalising symptoms (see for example, Abarrate, 1993). Many researchers had the primary aim of investigating the direction of effects between learning/reading difficulties and a range of psychosocial (e.g., self-esteem, social skills) variables (see for example, Dahle & Knivsberg, 2014; Jordan & Dyer, 2017; McArthur et al., 2022; Morgan, 2012; Morgan et al., 2008; Parhiala et al., 2015; Snowling et al., 2007). In other studies, mental health was not included as an outcome variable. Rather, the relative influence of learning difficulties and/or behaviour/mental health on children's social skills (Zach et al., 2016) or academic outcomes was investigated (e.g., grades, reading comprehension, secondary school completion; see for example, Blicher et al., 2017; Newbury et al., 2020; Sainio et al., 2019; Smart et al., 2019). However, in our estimation, the aim of 39 (40%) of the included studies aligned to that of this review; that is, the researchers aimed to better understand mental health in the context of childhood learning/reading difficulties. Not all researchers found dyslexia-related group differences in mental health concerns (see for example, Lindeblad et al., 2016). However, when differences were found, the balance of evidence suggests that reading difficulties precede internalising symptoms (Horbach et al., 2020; Jordan & Dyer, 2017; Lin et al., 2013; McArthur et al., 2022; Morgan et al., 2008; Russell et al., 2015), whereas the direction of effects between dyslexia and externalising symptoms was less certain. Specifically, there is evidence that externalising symptoms are associated with attentional difficulties which may be present before school entrance but can worsen in response to school demands (Carroll et al., 2005; Horbach et al., 2020; Willcutt et al., 2013).

In the qualitative studies (and one mixed method study), mental health was investigated among children with reading difficulties broadly. Among the studies incorporating a quantitative approach, the researchers of 25 studies focused on internalising symptoms only and those of one study focused on externalising symptoms only (Abarrate, 1993). Most researchers in this review (62; 63.3%) investigated both internalising and externalising symptoms. Many conducted their investigations of internalising/externalising symptoms with well-validated measures of global psychosocial functioning such as the Strengths and Difficulties Questionnaire (SDQ; 10 studies) and the Child Behaviour Checklist (CBCL; various versions, see for example, Achenbach, 1991; 27 studies). Of the total sample of the included studies (qualitative and quantitative), the researchers of 39 studies combined

perspectives (e.g., child and/or teacher and/or parent and/or both parents) on children's mental health. However, in nearly half of the included studies (45; 45.9%, excluding the adult retrospective studies where adults reflected on their own childhood experiences) children's perspectives on their mental health were not considered. Furthermore, a wide variety of child-reported measures of anxiety (11 measures) and depression (10 measures) were included in this review.

Third Factors

The research team formed 26 third factors categories (see Table 2.1 below) on the basis of common tools or measures and definitions provided in the publication. Each category was allocated to individual, family, and community-level factors. Many studies investigated factors on more than one of these levels. Where constructs are included in parathesis, they were deemed to be related to the primary third factor. Studies have been placed in a column depending on whether they primarily dealt with the third factor using qualitative, quantitative, or both approaches. When a quantitative approach was taken, we have provided an indication of whether a statistical association between the third factor and the mental health concern in the context of learning difficulties was found, not found, or was not tested. The table presented in Appendix E of this thesis presents the summary of findings from all 98 studies included in this review including information regarding the direction of association between the variables. Appendix E can be used to cross-reference study numbers in Table 2.1.

Table 2.1: "Third factors" and associations with internalising/externalising mental health (MH) concerns among children with reading/learning difficulties

Third factor	Qualitative	Association between third factor and MH Found *	No association between third factor and MH Found.	Third factor and MH measured. Association not tested.	Total
Individual-level (70 studies; 71.4%)					
Self-esteem (including self-perception, self-efficacy, self-worth) [†]	54, 25, 44, 78, 79, 83	14, 31, 42, 62, 63, 86, 87, 88		3, 11, 12, 18, 27, 29, 50, 56, 59, 68, 71, 74, 81, 84, 92, 98	30
Stress, coping and resilience (including locus of control and avoidance)	52, 78, 79, 83, 90	31, 40, 63, 94	85	3, 4, 5, 13, 30, 69, 72, 92,	18
Social skills (including language/communication skills and pro-sociality)	52	14, 51, 52, 97	87	13, 28, 34, 35, 46, 55, 57, 58, 65, 67, 73, 75, 76, 81	20
Emotion regulation (including emotional intelligence and emotional competence)	78, 52	14, 24, 49, 52		13	7
Academic performance	27, 41	39, 71, 74, 88		57, 77, 95, 96, 97	11
Attitude and approach to learning (including preoccupation with reading difficulties, learned helplessness towards schoolwork, focusing on strengths)	44, 79, 90	10, 82		29, 55, 56, 57, 58, 65, 77, 80	13
Functional impairment				32, 96	2
Response to diagnosis and disclosure situations (e.g., shame)	21, 37, 41, 54, 83				5
Self-awareness and self-advocacy skills (including understanding dyslexia and taking a strengths-focus)	52	86			2
Age of recognition of reading difficulties	44, 83	85, 89			4
Family-level (39 studies: 39.8%)					
Parental mental health and self-esteem	52	4, 7, 12, 48, 51, 52	10, 58	13, 60, 81	11
Parenting stress, coping, and parenting self-efficacy/confidence		12, 48	7, 61	17, 60, 70, 81	8
Parent emotion awareness and regulation			43	13	2

Third factor	Qualitative	Association between third factor and MH Found *	No association between third factor and MH Found.	Third factor and MH measured. Association not tested.	Total
Parenting values/practices (e.g., school involvement, "understanding dyslexia")	52	12, 19, 51, 52, 58, 86	61, 72	67, 81	10
Social support for parents (including parent advocacy for support)		7, 19			2
Parent-child relationship	52	5, 6, 14,16, 33, 51, 52, 86, 94	31, 61, 67	80, 92	14
Parent support for the child	25, 54, 78, 79, 83	63	31	11, 59	9
Family functioning	52	87	51, 52, 64	17, 57, 67	7
Parent preoccupation with child's reading difficulties		10			1
Community-level (54 studies; 55.1%)					
Teacher-child relationship (e.g., teacher (mis) understanding)	25, 53, 54, 90	6, 14, 20, 33		80	9
Teacher/school support (e.g., appropriate accommodation /adjustment)	54, 15, 83	63		11, 59	6
Friendship/peer support	27, 52	6, 63	52	11, 59, 92	7
Bullying	27, 54, 111, 41, 78, 79	8, 14, 45, 62, 91			11
School-connectedness (including liking school and school involvement)	27	9, 49	31	56, 96	6
Stigma/discrimination	21, 53, 54				3
Social problems (including loneliness)	78, 79	14, 31, 62, 86	2	1, 4, 5, 13, 22, 23, 26, 29, 34, 36, 38, 46, 47, 50, 64, 66, 75, 81, 93, 95, 96, 97	29

*check supplementary table in Appendix E for study numbers and for direction of association

[†]this category includes many domains of self-esteem (or related constructs), such as social self-esteem, scholastic self-esteem etc. Check supplementary table for specific domain of self-esteem explored in the study

Discussion

The aim of the current review was to scope the extent and the nature of the literature investigating factors which may influence the association between childhood dyslexia and internalising and externalising mental health concerns. In so doing, we aimed to identify gaps in the literature and use the findings of the review to inform decisions about directions for future research. Such research is needed to: (a) identify children who may be more (or less) at risk of mental health concerns, and (b) inform tailored mental health programs. To this end, our review identified a total of 98 sources (86 peer-reviewed journal articles and 12 theses) for inclusion dating from 1968. Twenty different countries were represented highlighting a global concern for the mental health of children who struggle to read. Our review includes: 70 studies in which individual-level factors (e.g., self-esteem) were explored; 39 in which family-level factors (e.g., the parent-child relationship) were explored; and 54 in which community-level factors (e.g., the teacher-child relationship) were explored. Most researchers investigated both internalising and externalising symptoms but those of 25 studies focused exclusively on internalising symptoms. One explanation is that internalising symptoms, specifically anxiety, have been highlighted as a particular mental health concern among children with dyslexia (see for example, Francis et al., 2019; Mugnaini et al., 2009).

Social Experiences

The social skills (20 studies) and the social problems (29 studies) of children with word reading/learning difficulties were amongst the most studied 'third factors' in this review. However, social difficulties were most often studied as correlates of learning difficulties (see for example, Goldston et al., 2007; Jordan & Dyer, 2017; Russell et al., 2015), poor academic performance (Zach et al., 2016), or attentional difficulties (Abarrate, 1993; Heying, 1987) that may co-occur, rather than as possible risk/protective factors for mental health. Furthermore, there was a focus on investigating children's challenges (e.g., peer difficulties) from the parent and/or the teacher perspectives rather than their strengths. Children's subjective feelings of loneliness were also under-studied, a finding consistent with Kwan and colleagues' (2020) recent review. Nevertheless, our review highlighted consistent links between bullying involvement and mental health concerns (Baumeister et al., 2008; Boyes et al., 2019; Iyanda, 2022; Turunen et al., 2019) and the protective function of friendship (see for example, Al-Yagon, 2016; Eissa, 2010), in the context of childhood dyslexia. Differences between child, parent, and teacher reports of social difficulties were reported by some researchers (see for example, Dahle & Knivsberg, 2014; Dahle et al., 2011), highlighting the importance of examining the context of social difficulties (e.g., school or home) in addition to

gauging children's own perspectives on their social strengths and challenges in future research.

Self-Esteem

Other individual-level third factors which have been widely studied in this field are self-esteem (and related constructs, e.g., self-concept/self-efficacy; 30 studies) and stress, coping, and resilience (18 studies). A secondary analysis of four different longitudinal studies by McArthur and colleagues (2022) found a link between early reading difficulties and later anxiety, depression, and poor reading self-concept (beliefs about oneself as a reader), suggesting that poor reading self-concept may be a risk factor for anxiety and depression. Consistent with this, Terras and colleagues (2009) found an association between low scholastic self-esteem (beliefs about oneself as a learner) and parent/child reported internalising symptoms, and Giovagnoli and colleagues (2020) found that adolescents with dyslexia who reported low levels of self-efficacy (belief in one's ability) with regard to school tasks experienced more somatic (headaches, stomach-aches) symptoms. However, there were some mixed results across the field regarding both the domain of mental health (anxiety, depression, externalising) and the domain of self-esteem/self-efficacy (e.g., scholastic self-esteem, social self-esteem) involved. Furthermore, most studies which examined the associations between self-esteem and internalising/externalising symptoms were cross-sectional by design meaning that the direction of effects could not be determined. Disentangling the strength and direction of these associations, and factors that support children's self-esteem in the context of dyslexia, would allow for the provision of timely and targeted support for children at risk of mental health concerns.

Coping and Resilience

Although over a decade old, Singer's (2005, 2007) foundational work suggests that the strategies that children with dyslexia use to cope with school-related difficulties (such as teasing and poor grades) are instrumental in supporting their self-esteem (or not). For example, the children she interviewed used self-talk to either support or hinder their self-esteem. Consistent with this, Hossein and colleagues (2022) found that children with reading disorder who had more 'grit' (i.e., perseverance) and 'resilience' were less likely to experience anxiety (reported by teachers) and depression (reported by parents). Similarly, Giovagnoli and colleagues (2020) found that internalising symptoms among adolescents with dyslexia were associated with a tendency to react to school-related problems with hypervigilance, defined as an "excessive sense of alertness" (p. 461). However, two other groups of researchers in this review did not find any group differences in coping related to

learning/reading difficulties although higher levels of internalising symptoms were observed (Gallegos et al., 2012; Novita et al., 2019). As such, we believe that an investigation of coping strategies, especially with regard to the school context, in relation to children's mental health warrants further exploration.

Emotion Regulation and Academic Factors

Emotion regulation (the ability to understand and manage one's emotions) is one aspect of coping which appears to be relatively under-studied in this field. Several studies in this review included an examination of factors related to emotion regulation, such as emotional intelligence (see for example, D'Amico & Guastaferro, 2017; Lawrence et al., 2019), focused on one aspect of emotion regulation, namely rumination (Bonifacci et al., 2020), or measured emotion regulation with a single item on a parent survey (Boyes et al., 2019). As a result, we believe that emotion regulation in the context of dyslexia has not been comprehensively explored. This represents a gap in the literature given that emotion regulation is strongly associated with mental health across the lifespan (Hu et al., 2014; Nyquist & Luebbe, 2020; Schäfer et al., 2016) and may be hindered among children who experience language/literacy difficulties in early childhood and beyond (Gendron et al., 2012; Hobson et al., 2019; Rieffe & Wiefferink, 2017). Certainly, there is evidence from experimental research that children with dyslexia, relative to controls, have more difficulty with recognising emotions in others (from facial and vocal cues; Goulème et al., 2017; Operto et al., 2020). This may suggest difficulty with understanding their own emotions, a basic building block to emotion regulation (Rieffe et al., 2008). Furthermore, many children with reading difficulties report experiencing heightened negative emotions (e.g., frustration, anger, sadness) in the school context (Leitão et al., 2017; Morgan, 2012) suggesting that effective emotion regulation may be a particularly salient intervention target for their mental health. Longitudinal studies using well-validated (child and parent/teacher versions) measures of specific socio-emotional competencies (e.g., emotion regulation, spoken language skills) are needed to test these associations over time and to build upon the existing work described in this review. Relatedly, children's attitude to their learning and whether they succeed in their studies despite their learning challenges has been linked to their mental health (see for example, Hossain et al., 2021; Lindeblad et al., 2016; Sainio et al., 2019; Sorrenti et al., 2019) and warrants replication.

Family Factors

In terms of family factors, the association between children's mental health and parental psychological variables (e.g., parental stress, anxiety, self-esteem, coping, emotion

regulation), the quality of the child-parent relationship, family functioning/support, and parenting values/practices is well researched. A strength of this field is the widespread use of well-validated measures such as the Parenting Stress Index (PSI; Abidin, 1995) and its short form enabling a comparison of the findings across the field. Importantly, the PSI-SF has been validated for use with parents of children with a wide variety of mental, emotional, and behavioural difficulties (Holly et al., 2019). However, much of the research in this section of the review has employed samples of children with a wide range of learning and attentional difficulties without specifying the sub-type (see for example, Al-Yagon, 2014). This is a limitation given that parents of children with dyslexia may have unique strengths and challenges (see for example, Antshel & Joseph, 2006; Bonifacci et al., 2016). Furthermore, the perspectives of fathers and siblings were often absent and there are mixed results which require further exploration. Nevertheless, future researchers are encouraged to investigate the value of whole-family support within mental health promotion programs for children with dyslexia and other learning difficulties.

School and Community Factors

Certainly, the importance of having parents who understand dyslexia and provide both emotional and academic support was highlighted by many studies in our review (see for example, Al-Yagon, 2016; Leitão et al., 2017; Terras et al., 2009). However, when interviewed, people with lived experience of dyslexia (especially parents/teachers and older adolescents/young adults) also raised school/community-level concerns such as: teachers' misunderstanding of dyslexia; a lack of accommodation and support for reading-related challenges; and experiences of stigma, shame, and discrimination in learning environments (see for example, Claessen et al., 2020; DeBrew, 2017; Hughes & Dawson, 1995; Learned, 2016; Leitão et al., 2017). Findings such as these suggest that children with dyslexia and other learning difficulties may be vulnerable to low levels of school connectedness, a concept that describes perceptions of being understood, supported, and treated fairly at school (by peers and by teachers alike; Libbey, 2004; Millings et al., 2012). Consistent with this, two sets of researchers in this review found evidence to suggest that school connectedness may be a particularly salient protective factor for the socio-emotional wellbeing of children with learning difficulties (Benassi et al., 2022; Kopelman-Rubin et al., 2020). Similarly, Chiappedi and Baschenis (2016) found that children with SLD who believed that their teacher understood and supported their learning disability reported significantly lower levels of anxiety. Future researchers are encouraged to replicate the aims of these studies using well-validated measures of school connectedness and dyslexia-specific samples. There is evidence

from our review that children with dyslexia experience a different trajectory of socio-emotional difficulties during the school years than those with other special educational needs (see for example, Jordan & Dyer, 2017), and therefore need to be differentiated in future research.

Methodological Considerations

A strength of the field is the widespread use of well-validated measures of children's psychosocial functioning such as the Strengths and Difficulties Questionnaire (SDQ) and the Child Behaviour Checklist (CBCL). This aids cross-cultural comparisons and the generalisability of each study's findings. However, many studies included in this review examined group differences (e.g., children with and without reading difficulties) with regard to the third factor rather than testing associations between the third factor and mental health concerns. This limits our understanding of risk and protective factors for mental health. Furthermore, in many cases, researchers relied on parent/teacher, rather than child, perspectives on internalising symptoms (see for example, Aitken et al., 2020; Benassi et al., 2022). Internalising symptoms may be difficult for an outsider to accurately assess; therefore, future research which gauges children's own perspectives is encouraged. Furthermore, to advance understanding of risk/protective factors for specific (e.g., depression) mental health concerns then the use of well-validated measures which align to DSM criteria (such as the Revised Children's Anxiety and Depression Scale (RCADS; Chorpita et al., 2000) and include parent/child versions, rather than (or in addition to) broad-band measures of psychosocial functioning such as the SDQ, are needed.

Additionally, our review highlighted a bias in the field towards investigating the psychosocial wellbeing of children rather than adolescents. Indeed, several researchers of longitudinal studies included in this review stopped tracking children's socio-emotional functioning by the time they reached the upper primary school years (see for example, Jordan & Dyer, 2017; Morgan, 2012; Russell et al., 2015). This presents a significant gap in the literature. Adolescence is a risk period for the onset of several mental health concerns (Lawrence et al., 2016) which may exacerbate for children with dyslexia due to concerns about the changes in the secondary school environment such as the increased difficulty of reading and workload (see for example, Giovagnoli et al., 2020). To complement the field, future researchers are encouraged to track children with and without dyslexia as they transition from primary to secondary school and beyond. Current research suggests that this school transition may be a risk period for both school connectedness and mental health

concerns among children broadly (Lester et al., 2013; Nielsen et al., 2017) and may have specific relevance for children with reading difficulties (Horbach et al., 2020).

Limitations and Future Research

The current review is limited by our exclusion of studies in which reading ability was measured as a continuous variable. We are aware of studies of this kind which would have addressed our research aim (see for example, Boyes et al., 2017). The decision to exclude these studies was influenced by the feasibility of the review process and the readability of a review with 100+ sources. Additionally, a quality assessment of studies in this field is warranted given the range of methodological limitations which has been briefly discussed. Nevertheless, we identified a variety of individual, family, and community-level factors which may influence mental health in the context of developmental dyslexia, located gaps in the literature, and offered suggestions for future research. Future research which examines associations between aspects of children's socio-emotional competencies (e.g., emotion regulation), domains of self-esteem, coping strategies, school connectedness, and sub-types of mental health (e.g., depression) in the context of childhood dyslexia is encouraged. This will improve understanding about risk and protective factors for the mental health of children with dyslexia. In terms of methodological factors, our review highlighted a need for more longitudinal work (especially over the transition to secondary school and beyond), which includes dyslexia-specific samples alongside typically developing comparison groups and includes child as well as parent/teacher perspectives wherever possible.

Conclusions

The current review highlighted a broad range of individual, family, and community-level factors which may influence mental health in the context of developmental dyslexia but relatively few studies which tested associations between third factors and mental health. We identified several gaps in the literature regarding both the content (e.g., school connectedness) and methods (e.g., child perspectives on mental health) of current research and proposed recommendations for future research. Such research is needed to help to identify children who are more (or less) at risk of mental health concerns and to inform tailored mental health promotion programs for children with dyslexia.

Chapter 3

Growing up with dyslexia: Child and parent perspectives on school struggles, self-esteem, and mental health.

The results of the scoping review highlighted a range of factors at the individual, family and community-level which may influence mental health in the context of developmental dyslexia. However, much research in the field is influenced by the medical model of dyslexia. For example, amongst the third factors there is an emphasis on deficits and a problem framework (e.g., 'peer problems') rather than strengths (e.g., friendships). Also, consistent with the medical model, I found a bias towards investigating individual-level (71.4% of studies) rather than family-level (39.8%) or community-level (55.1% of studies) factors. Furthermore, I found that much past research (45.9% of included studies) assessed parent and/or teacher (rather than child) perspectives on children's socioemotional wellbeing. This is a limitation given that internalising symptoms and some social difficulties (e.g., bullying victimisation) may be difficult for an outside observer to accurately assess. The aim of Study 2 of my PhD was to explore *both* child and caregiver perspectives on the socio-emotional experience of growing up with dyslexia. A qualitative approach was taken using semi-structured interviews and Braun and Clarke's (2006, 2013, 2022) reflexive thematic analysis approach was employed to analyse the data. Questions were open-ended so that participants could direct the focus of the interview within the boundaries of the research topic (see Appendix I and J for a copy of the interview protocols). Although I advertised for any caregiver to be involved in this research, only mothers volunteered. During analysis for this study, I prioritised the voices of children; caregiver perspectives were added to flesh out or compliment the child data when indicated. This study has been published open access (citation below). Supplementary materials for Study 2 are in Appendix F-O of this thesis. The child research summary is in an audiovisual format and I have provided a link to this as an unlisted YouTube video.

Wilmot, A., Pizzey, H., Leitão, S., Hasking, P., & Boyes, M. (2023). Growing up with dyslexia: Child and parent perspectives on school struggles, self-esteem, and mental health. *Dyslexia, 29 (1)*, 40-54. https://doi.org/10.1002/dys.1729

Attributions

Author	Contribution	Acknowledgement
Adrienne Wilmot	Development of research question and methodology, data management and analysis, interpretation of results, and manuscript preparation	
Hannah Pizzey	Assisted with data collection, interpretation of results and manuscript preparation	
Suze Leitão	Assisted with the development of the research question, methodology, interpretation of results, and manuscript preparation	
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Abstract

Children with dyslexia, compared with typically reading peers, are at increased risk of internalising (e.g., anxiety) and externalising (e.g., aggression) mental health concerns; why this is the case is largely unknown. Our aim was to explore the socio-emotional experience of growing up with dyslexia from both child and parent perspectives. In so doing, we aimed to gain a better understanding of self-esteem and mental health in the context of dyslexia. One-to-one semi-structured interviews with 17 children with reading difficulties (aged 9-14 years; 16 with a diagnosis of dyslexia) and their mothers (interviewed separately) were analysed using Braun and Clarke's reflexive thematic analysis approach with a neurodiversity lens. We developed three themes to address the research aim: (1) Different in a good/bad way; (2) Exhausted and overwhelmed; and (3) It takes a community: Family school connections. Children discussed having "worries" and experiencing school-related stress and embarrassment. Mothers perceived children's internalising and externalising behaviour (meltdowns), school refusal, and homework resistance as emotional responses to children's school struggles due to poor "person-environment fit." Our analysis highlights the particular importance of parent support, friendship, and school-connectedness for the wellbeing of children with dyslexia.

Practitioner points:

- The language of neurodiversity and drawing on a strengths-based approach during diagnosis and beyond is a useful framework.
- Regular emotion regulation breaks will support children with dyslexia during the school day.
- Schools and teachers can facilitate peer support in the classrooms and promote family–school connection.
- An individualised approach to supporting children is beneficial but needs to consider children's concerns about peer acceptance and the potential for embarrassment.

Introduction

Up to 10% of children experience severe and persistent reading difficulties despite adequate cognitive ability and educational opportunity; a figure that equates to approximately two to four children in an average-sized classroom (Brimo et al., 2021; Castles, McLean, & McArthur, 2010; Claessen et al., 2020). When reading difficulties persist without an alternative explanation, a child can be diagnosed with a specific learning disorder with impairment in reading, otherwise known as developmental dyslexia (APA, 2013). Childhood reading difficulties, such as dyslexia, can negatively affect reading motivation (Morgan & Fuchs, 2007), academic self-concept (beliefs about one's academic abilities; McArthur et al., 2020), and long term educational and occupational outcomes (Maughan et al., 2020; Smart et al., 2017). However, the difficulties for children who struggle to read go beyond the academic and occupational domains. When interviewed, teachers and parents express concern for the mental health of children with reading difficulties (Claessen et al., 2020; Leitão et al., 2017). Consistent evidence comes from cumulative cross-sectional and longitudinal studies, which find that children with reading difficulties, compared to typically reading peers, are at elevated risk for mental health concerns, both internalising (e.g., emotional difficulties such as anxiety) and externalising symptomology (e.g., behavioural problems such as aggression; Donolato et al., 2021; Francis et al., 2019; Russell et al., 2015). Understanding why childhood reading difficulties are associated with poor mental health, especially anxiety, is a stated research imperative (Boyes et al., 2016; Francis et al., 2019).

Previous researchers posit that emotional difficulties (e.g., anxiety) arise as a secondary consequence of reading difficulties (Jordan & Dyer, 2017; Morgan, 2012). Low self-concept (or related constructs such as low self-esteem) is suggested to be the mechanism; negative feedback (e.g., receiving bad grades) may contribute to children developing a poor self-concept or poor self-esteem, known risk factors for mental health concerns among children broadly (Boyes et al., 2018; McArthur et al., 2020; Terras et al., 2009). Consistent with this account, a theme across the literature is the protective power of positive feedback from parents and teachers who understand dyslexia and provide emotional support (see e.g., Haft et al., 2016; Singer, 2007). Relatedly, there is evidence that receiving a formal diagnosis of dyslexia can be protective of self-esteem, possibly because it facilitates self-understanding and/or social support (Glazzard, 2010; Leitão et al., 2017).

Whilst there is a wealth of literature examining self-esteem (and related constructs such as self-concept) among children with reading difficulties (Gibby-Leversuch et al., 2019; Livingston et al., 2018; McArthur et al., 2020), few studies in this field have investigated

these constructs in association with internalising/ externalising symptoms. Qualitative accounts suggest that self-esteem is salient in terms of the mental health of children with dyslexia (see e.g., Leitão et al., 2017; Riddick, 2010), but results from cross-sectional studies are equivocal (see e.g., Boyes et al., 2018; Giovagnoli et al., 2020; Terras et al., 2009) suggesting the need for a deeper and more nuanced analysis to better understand self-esteem in the context of dyslexia.

In terms of children's own resources, researchers find evidence which collectively suggests that their ability to cope adaptively is protective of self-esteem (Doikou-Avlidou, 2015; Singer, 2005, 2007) and may be associated with less depression (Alexander-Passe, 2006). Additionally, there is burgeoning evidence to suggest that the way children manage emotions (recognise, understand, and regulate) may have particular relevance for the self-esteem and mental health of children with reading difficulties (Boyes et al., 2019; Kopelman-Rubin et al., 2020; Nathan & Rucklidge, 2011; Singer, 2005). However, many of these findings are based on the perspectives of parents and teachers (see e.g., Boyes et al., 2019; Nathan & Rucklidge, 2011). This is problematic given the difficulty in interpreting emotional experience and internalising symptoms (e.g., anxiety) from an outsider perspective. Our aim, therefore, was to explore the socio-emotional experience of growing up with dyslexia from both child and parent perspectives. In so doing, we aimed to gain a better understanding of self-esteem and mental health in the context of dyslexia.

Methodology

We analysed the data using Braun and Clarke's reflexive thematic analysis approach (Braun & Clarke, 2006, 2013, 2022) within a critical realism/contextualism framework (Braun & Clarke, 2022). We selected reflexive thematic analysis because it encourages researchers to engage with their data in depth. We felt that depth was what was required to complement previous explorative work which provided a broad brush-stroke analysis of risk and protective factors for children's mental health concerns (see for example, Boyes et al., 2019; Leitão et al., 2017). However, rather than a close investigation of mother–child dyadic relationships, an exploration of patterned responses across the data set best suited our aim. For this reason, reflexive thematic analysis rather than a case study approach was preferred. Children and mothers were interviewed separately, and dyads were not linked in the analysis or report. Critical realism/contextualism informed our analysis, guiding our acknowledgement of the reality of participants' experiences situated within their socio-cultural contexts; their perspectives (Braun & Clarke, 2022).

Researcher positionality

The first author situates her research within the neurodiversity paradigm. Put simply, neurodiversity advocates challenge the medical model of "neurodevelopmental disorders" (such as autism) which conceptualises and labels them as disorders characterised by developmental 'delays' or 'deficits' (DSM-5; APA, 2013). Instead, proponents of neurodiversity suggest that neurodevelopmental 'differences' represent natural human variation, akin to the term biodiversity as it relates to the non-human world (Baron-Cohen, 2017), to be accepted/celebrated and not pathology to be fixed or cured (see e.g., Blume, 1998; Baron-Cohen, 2017; den Houting, 2019; Pellicano & den Houting, 2021; Singer, 1998)

Importantly, the neurodiversity paradigm is consistent with a strengths-based approach and the social model of disability; the latter argues that people are not disabled by factors within themselves (e.g., the fact that someone needs to use a wheelchair) but rather by a society that does not cater for their difference (e.g., a building that does not provide a wheelchair ramp; Oliver, 2013; Pellicano & den Houting, 2021). Taking this perspective implies that research that investigates changes to improve the mental health of children with dyslexia needs to look beyond within-child factors to consider "person-environment fit" (Mandy, 2019, p. 1880).

Materials

We developed two semi-structured interview protocols, one for children and one for parents. We chose a semi-structured format to enable a flexible and individualised approach. One of the members of our team is a highly experienced paediatric speech-language therapist who provided guidance regarding the content and style of the child protocol. Both protocols were piloted with one mother and child (acquaintances of the first author) before the study was advertised. The pilot went well and so the protocol remained unchanged and the data from the pilot was retained in the overall data set. The interview protocols explored child and parent perspectives on emotional experiences (at school and home), coping, support, and included a question to gauge mother (and child) feelings about the transition from primary to secondary school. In addition to the interviews, parents completed a survey which provided background (e.g., demographic) information about their family.

Participants

In total, 17 children (aged 9-14 years, school grades 3-9, 7 girls and 10 boys) and 17 mothers (1 per child) participated in this study. The study was open to any parent but only mothers volunteered. All but one of the children had a dyslexia diagnosis. This child had grown up outside of Australia and was diagnosed with phonological processing difficulties

consistent with a dyslexia diagnosis. The mother identified ongoing reading difficulties and the child was receiving school support for reading. In addition to dyslexia, our sample consisted of nine children with at least one other diagnosis: 5 with attention deficit hyperactivity disorder/attention deficit disorder; three with dysgraphia (writing difficulties); two with dyscalculia (mathematics difficulties); and one with autism spectrum disorder. Other diagnoses according to mothers were, auditory processing (one child), and processing/working memory difficulties (one child). All children were in mainstream schools, with the majority (12 children) in the final years of primary school. All children, according to their mothers, had received support for their reading difficulties, either at school and/or via external agencies (e.g., private speech-language therapists). Frequency of school support, according to mothers, ranged from "infrequent" to "daily." Three children were living in one-parent homes and the rest lived with both parents. Most children also lived with siblings, some of whom also had dyslexia and/or other learning or attentional difficulties. All but one participant was currently living in Perth, Western Australia.

Procedure

The study was approved by Curtin University's Human Research Ethics Committee in early 2021 (HRE2021-0084). After receiving approval, participants were recruited through private speech-language pathologists, a specialist tutor, social media, and word of mouth. All interviews were conducted between May–December 2021. Inclusion criteria were that the child had a confirmed reading difficulties diagnosis and was aged between 10 and 13 years. We later adjusted the age range to 9–14 years to accommodate interested participants. Informed consent was required from both children and a parent to participate.

All parents were provided with study information sheets (child and parent versions) when they first expressed interest, which detailed the aims and nature of the study. Parents were encouraged to read over the child version with their child before agreeing to take part. This information was reiterated to participants in person before signed consent was obtained. Participants could choose to be interviewed at Curtin University or in their own home. A total of 15 interviews were conducted face-to-face in one of these settings and two interviews (one inter-state interview and one which occurred during a Coronavirus disease (COVID-19) lockdown, were conducted online. All parent and child interviews were conducted simultaneously after written consent was obtained. The first author interviewed all parents (~45 min) whilst the second author interviewed all children (~20 min). All participants received a $15 gift voucher to thank them for their participation. Parents were offered a list of support services at the conclusion of the interview. After data analysis, a research summary

(child and parent versions, see Appendix N and Appendix O) was sent to participants and their feedback was invited.

During the 6 months of interviewing the first and second authors maintained reflexive journals and discussed the interview process at regular intervals. This promoted reflexivity and familiarisation with the data (Phase 1 of Braun & Clarke's, 2006, 2013, 2022 approach). Further familiarisation with the data occurred through the transcription process. All interviews were transcribed verbatim by the first author; which involved listening and re-listening to the audio files, a process which promoted deep engagement with the data. To ensure quality, the written transcripts were checked against the audio recordings by the second author, before being returned to the first author for finalising. To maintain participant confidentiality, all names were replaced with a pseudonym and information which could cumulatively identify an individual was replaced with generic descriptors in the manner described by Braun and Clarke (2013) and/or the pseudonym removed. An a-priori decision was made to integrate the child and parent data sets for coding and analysis. The first author coded the data inductively at both a semantic (surface meaning) and latent (underlying meanings) level (Phase 2) and developed an initial set of themes (Phase 3). Input from the whole research team developed the final analysis and report (Phase 4–6).

Analysis

Our analysis developed three themes to address the research aim. In each theme children's socio-emotional experiences were linked to mental health concerns if indicated. The first theme, "Different in a good/bad way" explores self-esteem, stigma, and shame related to "difference" as well as the protective function of parent support and the language of neurodiversity. Theme 2, "Exhausted and overwhelmed," explores children's school-based emotions, emotion regulation, and mother's perceptions of meltdowns, school refusal, and homework resistance as signs of exhaustion and overwhelm. Theme 3: "It takes a community: Family–school connections," explores perceptions of school as a poor "person-environment fit" (Mandy, 2019, p. 1880) for children with dyslexia, school connectedness, and peer relationships.

Data extracts are included to illustrate each theme. When selecting data extracts we prioritised the child voice. Parent data extracts were used to complement, contrast, or flesh out the child perspective when needed. Editing of the data consisted of adding punctuation and removing some utterances (e.g., um) to improve readability. Further editing, such as including the interviewer comments, removing irrelevant details, and/or joining data extracts from the same participant but from different time-points are indicated by [] in the report.

Theme 1: "Different" in a "good/bad" way

Our analysis supports the view that the neurodiversity paradigm may be having a positive influence on the lives of children growing up with dyslexia in contemporary Australian society. Specifically, the language of neurodiversity (difference not deficit) was being used by mothers to promote a positive attitude to the diagnosis. Children echoed this when they discussed their dyslexia during the interviews. Many described their dyslexia as meaning that they had a "different" way of thinking or learning, or that, their brain just works in a "different" way; not necessarily worse or better, just different. For instance, Lara explained how she responded to her diagnosis: *"I don't really mind, I thought it's kinda cool I guess, something different, I don't really mind much [….] I didn't like think of it as a bad, horrible thing."* In another example, Maisie enthusiastically discussed herself in comparison to a friend, remarking on differences, *"I'm different from her because she's good at this and I'm good at that,"* but not in a self-deprecating way. Previous research has found that receiving a dyslexia diagnosis can be positive for children because it may promote self-understanding and social support (see e.g., Leitão et al., 2017). Our analysis extends this, by suggesting that receiving a diagnosis can also promote pride, a positive dyslexic identity, and non-stigmatising language (difference not deficit) to self-advocate and explain dyslexia to peers. For instance, Michelle described how her daughter's diagnosis empowered her to discuss her difference with others in a positive (not shameful) way: *"once she got her diagnosis she's quite proud in telling people that she's got dyslexia yeah she's not shy or embarrassed about it or anything so I think it's good, makes her more confident I think."*

Interestingly, although most children felt positive about their dyslexia diagnosis (described above) and open about disclosing their dyslexia to others, there was a sense that some children preferred to do this on their own terms and/or to people they *"trust"* (Tilly). This distinction between people who "get it" and those that do not, was put eloquently by Tom: *"Most of my friends are understanding, cos I have told them about it, and they are cool with it and they know and they understand so if I am reading in front of them most of my friends get it [….] but when it's people that you are not so close with and you don't know the students, they look at you and sometimes they giggle and it's quite embarrassing."*

Furthermore, throughout our interviews, children expressed ambivalence regarding their "difference." At times they expressed "difference" in a positive way, as above, and at other times, children described their dyslexia as making them feel "different" in a bad way. Often in these instances, the "difference" was expressed as being deleterious to self-esteem (expressed as feeling bad about themselves or feeling "dumb" or "stupid") and self-efficacy

(expressed as giving up and/or the futility of their efforts) and was prompted by comparing themselves negatively to peers in the school context. For instance:

Jana: "*It* [talking about her dyslexia] *makes me feel different in like multiple ways, so say that I was like doing like a writing competition or something and everyone did really good, and I did terrible, it makes me feel bad about myself.*"

Leo: "*There's a big difference in what I do at school than all the other kids, it's like me wanting to be like really good at something and then like everyone else in the class is like really good at it except for me, and it's just like well what's the point of me trying that if I can't do it.*"

Maisie: "*It just feels weird, it just feels weird and sad because I don't know what's happening in school [later in the conversation] it's bad because all the other kids know what's happening or like they can do it properly, but I can't do it because I have dyslexia yeah and it's just really annoying.*"

Many of the children, like Tom above, described being at one time or another, embarrassed by aspects of their dyslexia (such as poor reading), and many expressed not wanting to "look different," be "pin-pointed" or made to "stand out." It is possible that the children were motivated to hide their difficulties for fear of being teased, as posited by Singer (2005). Alternatively, it may be that children have internalised stigma about being "different" in a bad way; not it seems towards the diagnostic label but rather stigma related to needing support in a culture that values independence and 'privileges perceived ability' (Leitão et al., 2017, p. 331). This interpretation is supported by our data. For example, for some children asking teachers for help or using learning accommodations which mark them out as "different" was described as "embarrassing." For instance:

Issy: "*If like I had to read something quite fast and a lot of like words that I don't know in it that gets really stressful and I don't really know what to do and I usually like ah probably get embarrassed if I ask someone to help* [later in the conversation] *I don't really like teachers making it obvious that I need to take a test out of class and it's really annoying [....] and then also like I got this C-pen thing and it, and it always like gives me too much attention, like, I don't really like having that much attention on me.*"

Our analysis also suggests that fear of having their difficulties exposed to peers can create anticipatory anxiety. For instance, Tom described worrying in the classroom at the prospect of reading aloud in front of peers and having little power to do anything about it:

"Each student would stand up and read and then it would go on to the next person for a paragraph each and like as soon as it's coming around to me I'm just like "oh, no", like

everything is going on in my mind and I'm like "oh no this isn't going to be good", but I just have to get on and do it because there isn't anything else to do."

Similarly, Tess expressed her view that her son's school refusal and lowering self-worth may be linked to fear of classroom humiliation of this kind:

"He had a terrible teacher that really just was awful to him [Int: oh, that's tough for you] *yeah, she made him do the alphabet in front of all the classroom, she made him do maths games in front of everyone, I mean she was just awful, and that really affected him and us and then he didn't want to go to school and I think his self-worth really just sort of dropped."*

A particular priority for mothers was to maintain their children's self-esteem against perceived threats inherent in teaching practices which enable children (and peers) to make negative peer evaluations, such as being made to read aloud in front of peers. A range of parenting strategies was described to promote self-esteem, such as: using role-models of successful adults with dyslexia to promote their child's hope in the future; actively engaging their child in a range of extra-curricular activities in which they experienced success; and challenging children's negative self-talk. For example, Judy explained how she addressed her daughter's negative self-talk by focusing "the problem" on environmental (teaching methods) rather than within-child factors:

"So, we'd always said to her the problem is not with you the problem is with us learning how to teach you [….] your brain works in a different way, so whenever she would come out with those negative comments, that was our sort of response, no, no, it's not that you're dumb."

Theme 2: Exhausted and overwhelmed

With few exceptions, the children we interviewed described school as a struggle. Children were keen to point out that dyslexia affected them across the curriculum, even in mathematics. However, in contrast to previous studies, which highlight children's academic struggles in terms of recurrent academic failure/bad grades and the concomitant association with poor self-esteem (see for example, Singer, 2007), our analysis presents "school struggle" in terms of children being overwhelmed by the workload, stressed by the pace of the learning, confused about what's going on, and frustrated and annoyed by the impact that their reading difficulties had on their ability to do their work. For instance, Brodie described how he felt at school:

"When everyone else is done I'm still reading so like I gotta catch up, catch up, and by the time they've finished all the text I'm still reading and they've got it all and they're all on the mat and I didn't get to finish all of them so I had to go down to the mat and do something else [and then later after being asked how that feels] *it feels a little bit stressed cos like after that*

we have to do writing about what we've read so when they pass the sheets around I have to do that and so I barely know what to do and like what to write about."

Furthermore, in contrast to stereotypes, our analysis suggests that some children with dyslexia do perform well at school in terms of grades, yet they still struggle. For example, Tom, expressed his struggle in terms of time–pressure and how long he can read before getting tired:

"I try to find the key points in the text rather than having to read the whole thing so sometimes I do miss something important because I haven't read through the whole thing and that's really annoying and then I can get the answers wrong and because I can't comprehend the whole thing I need to find certain things before I get too tired or, because it's quite tiring having to read for me."

When speaking to mothers the most common word used to describe how their child's dyslexia affected them was "frustration" whereas children more often referred to "embarrassment," "stress," and "annoyance" and feeling confused in the classroom. Most children we spoke to were excited about moving to secondary school, especially when they were moving with friends. However, they expressed concern when their thoughts turned to the expected increase in workload and/or difficulty. For instance:

Simon: *"I know that all the spelling, reading and things like that are just going to jump up another level at me so it's the one, mostly the only, thing that I'm worried about for like going into 7* [referring to year 7 – the first year of secondary school in most Australian schools]."

Given our interest in emotion regulation and links to mental health we asked children what they do at school when they feel negative emotions (e.g., stressed). Generally, children said they "just get on with it" or words to that effect, with some reporting how they use positive self-talk to motivate themselves: *"I make myself feel better by saying "you can do it"* (Julie).ʹ Arlo provided an insider perspective on how his school struggles affected him:

"You can get stressed a lot of the time and then usually get angry if like after school cos you've had like a hard day [....] when I get home I'm stressed, it gets like if I'm doing an assignment I get really angry and it gets really difficult [....] like if it's like really [emphasis] *difficult* [Int: yeah] *I sometimes cry and get really emotional."*

Some mothers explained that their child needs to retreat to their room for a while or 'switch off' from school/homework to recover. Many mothers discussed how they support their child to calm down/relax after school by for example, taking them for a swim, running them a bath, or calming them through reassuring words. Children also described a range of

ways they deal with their school stress when they get home such as: drawing, music, sport, and outdoor activities. For instance, one child discussed how sport helps him release stress: *"When you are focused on something else, like when you've got the ball at your feet and you are moving, and you're thinking about like what to do with the ball rather than like what you did at school yesterday and I think that can like relax you and when you get home you're fresh and your mind's in a different state again."*

From mothers' perspectives, however, many children hold their stress, anxiety, and frustration in during the school-day and release it in the 'safety' of home (Mary) through what several described as a 'meltdown' consisting of both externalising (e.g., lashing out) and internalising (e.g., crying, irritability, school refusal) behaviour.

Mary: *"He comes home quite agitated and stressed and overwhelmed when there's too much, when there's more than a couple of things that he has to remember, do, assignment periods, test periods, those kind of things, and that spills out to home, because of course, that's where he takes out his emotional overwhelming and stress and the safe place to* [chuckle] *to kinda vent."*

Christy remarked how her son's teachers described him as anxious at school, but at home, due to what she perceived to be school-related *"cognitive overload"* she said, *"he's constantly like pushing his* [siblings] *buttons, like fully meltdowns."* Similarly, Karen perceived her son's "temper" to be an expression of anxiety: *"we're still working on his temper, I suppose, he just gets a little bit, ah, I think it's the anxiety and it comes through in anger."*

Like Christy, many mothers perceived their children's meltdowns and homework resistance to be triggered by mental exhaustion (*"cognitive overload"* [Christy]; *"cooked"* [Grace]) due to the extra effort needed to get through a school day when you have dyslexia and the extra workload children with dyslexia often have in comparison to peers (e.g., tutoring homework). For instance:

Michelle: *"I think it's hard for them because they get homework with school and then her tutoring homework I think sometimes she gets frustrated cos she's got extra work to do, so it's already like their struggling and they find school hard and then they have to do extra work* [....] *it's really, really difficult for them so it's not enjoyable so it's strenuous and hard and you can see them at the end of the day and their brains have been working over-time and then you have to make them do extra work."*

Theme 3: It takes a community: Family–school connections

Mathew [child participant]: "*One of the famous quotes I've heard is if you judge a fish on its ability to climb a tree it will think it's whole life that it's bad and it's failed in life but if you judge a fish on how well it can swim it will think it's whole life on how it can be good.*" It seems likely that Mathew has heard this quote from a parent or teacher who used it to support his self-esteem. It suggests that he perceives school to be an environment that does not allow him to show his strengths; that at school he is like a fish trying to climb a tree. Many mothers perceived school to be an environment that highlighted their child's difficulties and minimised their strengths, and some linked this poor "person-environment fit" (Mandy, 2019, p. 1880) to their child's mental health concerns. For instance:

Karen: "*The anxiety that comes about for kids like [child's name] they just sit there, and they know that the expectation is that you can read it, but you can't, and then nobody's giving you the opportunity to excel in different ways, it's still very focused on, you know your As and Bs.*"

Many mothers related their struggle for school to recognise and accommodate their child's learning differences and concern for children whose families did not have the resources (time, money, skills) to advocate and support them. Relatedly, some mothers speculated that their child's mental health may worsen if they were not putting in extra effort to support and advocate for their child at school. For instance:

Mary: [referring to the homework support she provides her son] "*I often wonder what would happen if I didn't, if I just let him, left him to his own devices [….] I think he would be struggling, I think we'd see it, I think we'd see him acting out in other ways now if we weren't supporting him.*"

One mother, Kate, referred to school support as "paramount" but also noted that her family were fortunate in this regard:

"*The school have been amazing, absolutely amazing, and if we could almost get that level of support for every kid, that would just be fantastic, because what I've learned from other parents is there is not that level of support for every kid.*"

Our research suggests that perceptions of a positive family–school relationship were an important protective factor for the mental health of children and their mothers. Having teachers (and principals) that were caring, responsive to parents' suggestions, and interested to learn more about how best to support a child with dyslexia were highly valued. For many, these attitudes and personality factors seemed to be more important than how much teachers already knew about dyslexia. For instance:

Brodie*: "I've got the principal, she helps me, like when she comes to the class, she like checks on me to see how I'm going in class and at school [....] she's helping a lot with me* [Int: and so how do you feel about that?] *I feel really appreciated about that."*

In terms of peer relationships, our analysis suggests fewer incidents of overt and severe bullying relative to past research (see for example, Singer, 2005). Across our interviews, peers were more likely to be described as friends rather than foe by both children and their mothers. Nevertheless, several children described incidents of being laughed at and/or teased for their dyslexia-related challenges (e.g., poor reading, difficulty following instructions) and there was a sense that parents and teachers were not always aware of these occurrences. Other mothers were well-aware of their child's peer difficulties. For instance, Trudy described her child as experiencing a lot of school-related anxiety*: "A lot of anxiety with school lots of anxiety [....] you can tell if something's bothering him cos he starts getting really like clingy, upset, and doesn't want to go to school and gets really disgruntled easily."* Later in the conversation, she discussed links between his struggles and peer difficulties: *"I think the friendship thing, he does struggle a bit, and I think that affects him a bit, just cos, you know, kids are kids, they just can be cruel."*

Our analysis suggests that friendships were particularly important for the well-being of children with dyslexia. Many children (and parents) credited friends as providing an enormous amount of emotional and practical support at school, and when this occurred, parents seemed to worry less about their children. For instance:

Kate: [describing her daughter] *"She's got this gorgeous friendship group [....] lovely, lovely little friends, it is wonderful [....] so if she sees friends struggling she says 'oh the answer to that is blah blah blah because of x, y, z' and then she's got favours in the bag so that when she needs help, she does not feel bad saying 'I don't get that, how do I do that?', so, they kind of help each other, they work together."*

This kind of child-instigated reciprocal support did not seem to be "embarrassing" to children. Possibly because it is less stigmatising for children with dyslexia than seeking teacher support, highlights that all children have strengths and challenges, and reflects children's empowerment to choose support from those they trust. This may explain why moving to secondary school with friends seemed to counter child and parent concerns about the transition and contribute to children's excitement about the new learning environment.

Concluding comments

Our aim was to explore the socio-emotional experience of growing up with dyslexia from both child and parent perspectives. In so doing, we aimed to gain a better understanding

of self-esteem and mental health in the context of dyslexia. We took a neurodiversity lens to our analysis and prioritised the voices of children.

Consistent with previous research (Leitão et al., 2017; Riddick, 2010; Singer, 2005, 2007), our analysis suggests that children with dyslexia face perceived threats to their self-esteem within the school environment and many feel stressed, confused, annoyed, and embarrassed by their learning challenges. Our analysis is also consistent with previous findings regarding the crucial role of parents in supporting their child's self-esteem (see for example, Leitão et al., 2017; Singer, 2007; Terras et al., 2009) and emotion regulation (Singer, 2005). We extend these previous findings by highlighting nuances (what's helpful or not helpful) regarding children's relationships with parents, friends, and teachers. Further, this study highlighted the particular importance of perceptions of parent-school partnership, school-connectedness, and friendship for the well-being of children with dyslexia. It is intuitive that school-connectedness, a concept that describes perceptions of being treated fairly, supported, and included at school (Libbey, 2004; Millings et al., 2012) may be hindered among groups whose learning needs are somewhat different from the norm. Yet, this factor is relatively under-explored in the dyslexia field. Future researchers are encouraged to investigate friendship, school-connectedness (parent and child perceptions), and parent support in links between dyslexia/reading difficulties and mental health (anxiety and depression).

Previous researchers have found that receiving a dyslexia diagnosis can be positive for children's self-esteem possibly because it promotes self-understanding (Leitão et al., 2017). Our analysis extends this, by suggesting that receiving the diagnosis (couched in the language of neurodiversity) can promote pride, a positive dyslexic 'identity', and empower children to self-advocate. This suggests that the neurodiversity paradigm which promotes acceptance of neurological differences such as autism and dyslexia (Pellicano & den Houting, 2021) may be having a positive influence on children's well-being. It also sign-posts a possible lessening of social stigma regarding learning difficulties such as dyslexia. Nevertheless, in our study children expressed ambivalence towards their "difference." Specifically, many expressed a desire to hide their difficulties out of shame (expressed as "embarrassment"). Furthermore, our analysis suggests that children's fear of having their difficulties exposed may prompt anticipatory anxiety and/or school refusal. These themes are under-explored in the dyslexia field and warrant further investigation.

In terms of mental health, children discussed having "worries" and experiencing school-related stress whereas many mothers disclosed that their children have (or had)

experienced anxiety related to their school struggles. In some cases, the child's anxiety had been identified by school but in most cases, it was noticed by parents through behaviours such as clinginess, short temper, and school refusal. This is consistent with the results of reviews of quantitative studies which find that children with reading difficulties, relative to typical readers, are at elevated risk for anxiety (see for example, Francis et al., 2019; Maughan & Carroll, 2006). It is also consistent with previous qualitative work describing school refusal among children with dyslexia (Riddick, 2010). Our analysis, however, offers a plausible explanation for the parent-reported externalising behaviour prevalent in much past research (see for example, Russell et al., 2015). Specifically, that externalising behaviour may be an expression of anxiety, exhaustion, or the build-up of stress and frustration that has occurred through the school day.

The possibility of stress and/or exhaustion as a mechanism for children's mental health concerns is relatively unexplored in the dyslexia literature. However, these findings are consistent with recent research in the autism field suggesting a link between elevated levels of anxiety (and depression) among autistic adults because of the stress and exhaustion of trying to 'mask' their differences and 'fit in' to an unaccommodating neurotypical world (see for example, Higgins et al., 2021; Hull et al., 2021; Phung et al., 2021; Raymaker et al., 2020). Certainly, many mothers (and some children) in our study expressed a perception of school as a mismatch for their children; that they, as Mathew put it, are fish being asked to climb trees. There were several accounts of children having reached and/or over-extended their energy resources, particularly when it came to "meltdowns," homework resistance, and Tom's description of being under pressure to finish work because reading is "tiring" for him.

In terms of emotion management, the children we interviewed described a range of out-of-school strategies to deal with school stress and difficult emotions. Furthermore, many had mothers who were supporting them with their emotions once they got home. Nevertheless, our analysis is consistent with Singer's finding that children with dyslexia may be "concealing" their emotions at school (Singer, 2005, p. 411). However, our analysis extends this to suggest that children were concealing their emotions at school and then releasing (through meltdowns) or regulating emotions that build through the school day once they got home. The prospect of children suppressing their emotions to get through the school day is concerning. There is robust evidence that the habitual use of this emotion regulation strategy (emotion suppression) is linked to anxiety and depression across the lifespan (Hu et al., 2014; Schäfer et al., 2016), peer relationship difficulties in adolescence (Chervonsky & Hunt, 2018, 2019), and may impair memory (which may in turn hinder a child's cognitive resources for

learning; Gross, 2002). Future researchers are encouraged to investigate emotion suppression and stress/exhaustion as possible mechanisms for mental health concerns among school-aged children with dyslexia.

A limitation of our study was that most children we interviewed were aged 10–12 and in the latter years of primary school. Our analysis suggests that adolescents may have different concerns to younger children (e.g., more concern about impression management and hiding their reading difficulties from peers) which requires further analysis. Additionally, the findings of our study are limited by the fact that many of the children interviewed had comorbid disorders which may contribute to the socio-emotional difficulties described. Furthermore, the verbal format of the interview protocol may have excluded children who have difficulty expressing their thoughts and feelings through words. Future researchers are encouraged to offer a variety of formats (e.g., drawing) to elicit children's responses. Nevertheless, taking a neurodiversity perspective and harnessing both child and mothers' perspectives provided an opportunity to frame children's school struggles as a case of poor "person-environment fit" and suggest supports for mental health that focus on changing children's environment rather than within-child factors (Mandy, 2019, p. 1880). Specifically, our analysis suggests that teaching practices which: promote peer support in classrooms (such as by seating friends together); regular emotion regulation breaks during the school day; opportunities for all children to showcase their strengths; and individualised approaches to academic support which respect children's concerns about exposure and other needs (such as reduced homework) are supporting children's mental health.

In conclusion, our analysis highlighted children's ambivalence toward their "difference" and their experience of dyslexia-related school struggles as well as mothers' concerns regarding the self-esteem and mental health of their children. Children who have fewer supports (parent, friend, and school) in place may be at particular risk of experiencing poor self-esteem and mental health. Importantly, our study highlighted links between mental health concerns and: stigma, shame, and self-esteem (Theme 1) and emotion regulation, stress, and exhaustion (Theme 2) to be investigated by future researchers. Our study also contains practical recommendations for parents, teachers and health professionals who work with children with dyslexia.

Chapter 4

"I struggle at times to see her struggle": Mothers' perspectives on dyslexia-related school struggles and the inter-connected nature of mother and child well-being.

The scoping review (Study 1) highlighted a significant body of literature that has explored links between parent (e.g., parenting stress) and child psychological variables in the context of learning challenges. However, there are mixed results regarding the nature of parenting stress and few dyslexia-specific studies. Study 3 of my PhD program addressed this gap in the literature. Specifically, I explored the nature of links between child and parent psychological variables in the context of dyslexia. Furthermore, I explored the nature of parental support for children's mental health. I learned how many families have adopted a neurodiversity mindset to support their children's self-esteem and frame their children's school struggles as a problem of "poor person-environment fit". Only mothers volunteered so future research exploring father and sibling perspectives would extend the results of this study. The sample, data, and methodological processes were the same as for Study 2. This study has been published open access (citation below) as a companion piece to Study 2.

Wilmot, A., Pizzey, H., Leitão, S., Hasking, P., & Boyes, M. (2023) "I struggle at times to see her struggle": Mothers' perspectives on dyslexia-related school struggles and the inter-connected nature of mother and child well-being" *Dyslexia, 29 (2):136-150.* https://doi.org/10.1002/dys.1733

Attributions

Author	Contribution	Acknowledgement
Adrienne Wilmot	Development of research question and methodology, data collection, management and analysis; interpretation of the results and manuscript preparation	
Hannah Pizzey	Assisted with data collection, interpretation of the results and manuscript preparation	
Suze Leitão	Assisted with development of research question, methodology, interpretation of the results and manuscript preparation	
Penelope Hasking		
Mark Boyes		

Abstract

Introduction: Parents of children with dyslexia may be at elevated risk for parenting stress and mental health concerns. Our aim was to explore the emotional experience of growing up with dyslexia in Australia from parents' perspectives. In so doing, we also developed an understanding of parents' own mental health and support needs informed by their lived experience. **Methodology:** Seventeen interviews with mothers of children (9–14 years; 16 with a diagnosis of dyslexia) were analysed using Braun and Clarke's reflexive thematic analysis approach. **Analysis:** Five themes were developed to address our aim: Theme 1: Years in the wilderness: Life before diagnosis; 2: "I struggle at times to see her struggle"; 3. School struggles: Advocating for our children and managing distress; 4. "It's a full-time job" and a "long slog"; 5: Care for the carer: Social support and coping strategies. **Conclusions:** Our analysis suggests that mothers of children with dyslexia may be at elevated risk for mental health concerns. Specifically, chronic worry and stress, secondary distress, challenges to parenting self-efficacy, and lack of support and understanding (feeling isolated) were highlighted as plausible risk factors. Mothers described coping strategies at the community level (e.g., school connectedness) and at the individual level (e.g., 'acceptance') as protective.

Practitioner points:

- The language of neurodiversity and a strengths-based approach is a useful framework and reflects parents' own perspectives.
- The emotional support needs of parents are important to consider in addition to those of the children.
- Schools and teachers can promote family–school connection.

Introduction

Dyslexia is "characterised by difficulties with accurate and fluent word reading, poor spelling and decoding abilities that do not progress as expected with the provision of well-intentioned and targeted intervention" (Dyslexia SPELD Foundation, 2022a). The dominant aetiological account of dyslexia is that it is associated with difficulties with the ability to represent, store or retrieve speech sounds, which can present challenges when learning to associate those sounds with their corresponding letters (Castles et al., 2010). These difficulties are based on neurocognitive differences that are highly heritable (Brimo et al., 2021), persistent across the lifespan (Maughan et al., 2020), and frequently associated with language processing (Snowling & Melby-Lervåg, 2016), as well as executive functioning (Lonergan et al., 2019) and sensory processing differences/difficulties consistent with other forms of neurodevelopmental difference (Brimo et al., 2021). The Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5) has a category for dyslexia within the Specific Learning Disorders (SLDs), which also includes dysgraphia (difficulties with writing) and dyscalculia (difficulties with mathematics), all of which appear under the umbrella of Neurodevelopmental Disorders (APA, 2013).

If diagnosed, Australian children with dyslexia can receive educational accommodations such as extra time to complete tests (Dyslexia SPELD Foundation, 2022b). However, many children with dyslexia remain unidentified. It may be that they employ compensatory cognitive mechanisms to read, reading at what teachers/parents consider to be age-appropriate levels albeit with more cognitive effort invisible to an outside observer (Livingston & Happé, 2017). Furthermore, families in Australia face barriers to diagnosis, such as financial cost, and needing to demonstrate diagnostic exclusionary criteria such as whether their child has received adequate educational opportunity to learn to read. For these and other reasons, it is difficult to accurately assess prevalence rates for dyslexia. Nevertheless, it is estimated that up to 10% of children experience severe and persistent word-reading difficulties consistent with dyslexia (Brimo et al., 2021; Hulme & Snowling, 2013b).

Australian researchers using longitudinal designs and large population-based samples find that early reading difficulties are a unique risk factor for long-term educational and occupational outcomes, such as secondary school completion (Smart et al., 2017), consistent with findings from other parts of the world (see for example, Maughan et al., 2020). Researchers also find that children with reading difficulties, including dyslexia, are at elevated risk for mental health concerns, both internalising (e.g., anxiety) and externalising

(e.g., aggression) symptoms (Francis et al., 2019; Russell et al., 2015). These concerns appear (at least in terms of anxiety) to have environmental rather than genetic causes (Whitehouse et al., 2009), and an onset in the early years of schooling (Jordan & Dyer, 2017).

Indeed, children with dyslexia often struggle at school and many report feeling stressed, sad, and frustrated (Leitão et al., 2017; Morgan, 2012). School-related stressors have been linked to poor self-esteem, anxiety, and school refusal among children with reading difficulties (Claessen et al., 2020; Riddick, 2010). In terms of parenting, cumulative evidence suggests that parents of children with dyslexia may be at elevated risk of experiencing parenting stress and distress (isolation and unhappiness in the parenting role; Antshel & Joseph, 2006; Bonifacci et al., 2013; Carotenuto et al., 2017; Delaney, 2017; Matteucci et al., 2019; Woodcock, 2020). However, there are mixed results in this field, especially in terms of the nature and source of parenting stress (i.e., child and/or parent factors) and risk for mental health concerns such as anxiety (see, for example, Bonifacci et al., 2019; Bonifacci et al., 2013; Matteucci et al., 2019). Mixed results such as these highlight the likelihood of risk and protective factors influencing parents' well-being in the context of dyslexia.

Rationale and aim for the current study

Given the identified links between parents' mental health and children's well-being broadly (Reupert & Maybery, 2016), and the particular importance that parental support appears to have for the self-esteem and mental health of children with dyslexia specifically (Singer, 2007; Terras et al., 2009), further research exploring the emotional experience of parenting children with dyslexia is needed. With few notable exceptions (Delaney, 2017; Earey, 2013; Woodcock, 2020), qualitative research in this field has focused on the well-being of children rather than parents (see for example, Leitão et al., 2017). Furthermore, interventions to support the mental health of children with dyslexia (see for example, Boyes et al., 2020) have focused on within-child rather than whole family factors and may therefore need to be complemented with parenting support/intervention. Our aim was to explore the emotional experience of growing up with dyslexia in Australia from parents' perspectives. In so doing, we also developed an understanding of parents' own mental health and support needs informed by their lived experience.

Methodology

Braun and Clarke's (2006, 2013, 2022) reflexive thematic analysis approach guided our analysis. Employing this approach, researchers develop themes from patterned responses across the dataset. We selected this approach as it is theoretically flexible, well-suited to exploring people's lived experiences, and promotes an in-depth and interpretative analysis of

data allowing semantic and latent (underlying meanings) coding (Braun & Clarke, 2019, 2022). We anticipated that parents may speak indirectly rather than directly about their mental health. Therefore, an approach that encourages latent-level coding and an interpretive analysis would be needed to address our research aim. Our analysis was situated within a critical realism/contextualism framework, which acknowledges the reality of mothers' experiences as perspectives, framed by their own sociocultural context (Braun & Clarke, 2022).

Researcher Positionality

Our research team includes people with lived experience of neurodiversity and clinical experience working with families of children with a range of neuro-developmental differences. The first author situates her research within the neurodiversity paradigm that conceptualizes neurodevelopmental 'disorders' such as dyslexia and autism as brain-based 'differences' to be accepted rather than disorders to be cured or fixed (Baron-Cohen, 2017; den Houting, 2019; Singer, 1998). Taking this perspective would suggest that children with dyslexia have a right to be given opportunities to learn in ways that match their strengths (environmental changes) in addition to being provided with evidence-based reading intervention to improve their reading if desired (within-child changes). Although used in scientific and popular literature in the autism field (for a review see, Pellicano & den Houting, 2021), to the best of our knowledge, our research (see also, Wilmot et al., 2023a) is the first to take a neurodiversity lens to a study of the mental health and well-being of parents and children with dyslexia.

Materials

Interviews were guided by a semi-structured interview protocol consisting of open-ended questions (see Appendix I and Appendix J for copies of the interview protocol). This approach empowered participants to shape the focus and direction of their interview whilst staying within the parameters of the research topic. In addition to the interview, parents completed a survey that provided background (e.g., child diagnosis) information. We also interviewed the children in a separate interview (see the companion article, Wilmot et al., 2023a).

Interview questions focused on child and parent well-being (i.e., emotional experience, coping, support) and included a question about mothers' (and child) feelings about the transition from primary to secondary school. The protocol was piloted on one mother of a child with dyslexia, an acquaintance of the first author, before recruitment for the study

commenced. The pilot went well and so the protocol remained unchanged and the data from the pilot interview were retained.

Participants

The study was open to all parents or carers of children with recognised reading difficulties aged 10-13 years. Only mothers volunteered. We chose this age range as we were interested in exploring the experiences of families during the transition from primary to secondary school. In Western Australia, the last year of primary school is generally year 6, when children are approximately 11 years old. We later extended the age range to 9-14 years to accommodate interested families.

Seventeen mothers of children (aged 9-14 years, 7 girls and 10 boys) with a reading difficulties diagnosis participated. Nine children had at least one other diagnosis (see Table 4.1 below). All children were attending mainstream schools and the majority (15 children) were in primary school. Three mothers lived in single-parent households. Most families had between 2 and 4 children and some siblings also had learning and/or attentional difficulties. Of the 17 participating families, 16 lived in Perth, West Australia and 1 in Sydney, New South Wales.

Procedure

The study was approved by Curtin Human Research Ethics Committee (HRE2021-0084) in early 2021. Interviews were conducted between May and December 2021. Participants were recruited through speech pathologists, a tutoring service, social media, and word of mouth. Interviews took approximately 45 min and were audio-recorded. Two interviews occurred online due to distance or Coronavirus safety requirements. The remainder took place face to face at Curtin University or in participants' own homes, depending on participant preference. Participants were fully informed about the aims and nature of the study before providing written consent. All participants received a $15 gift voucher to thank them for their participation.

Reflexivity during the 8-month interview process was promoted through reflexive journaling and regular discussions between the first and second authors. Familiarisation with the data (Phase 1 of Braun and Clarke's (2022) 6-phase approach) began during transcription and coding. All interviews were transcribed by the first author, checked against audio files by the second author, and returned to the first author for finalising. A pseudonym was used to de-identify the transcripts. Furthermore, details that could cumulatively identify a participant were replaced with a generic descriptor or the pseudonym removed.

Table 4.1: Child diagnostic details

Background Variable	Number of Children	Frequency
Reading difficulties diagnosis		
Dyslexia	16	94.1%
Other: "phonological processing difficulties"	1	5.9%
When was dyslexia diagnosed (school year)?		
No dyslexia diagnosis	1	5.9%
Year 2	5	29.4%
Year 3	5	29.4%
Year 4	1	5.9%
Year 5	2	11.8%
Year 6	3	17.6%
Additional diagnosis		
No additional diagnosis	8	47.1%
ADHD/ADD	5	29.4%
ASD	1	5.9%
Additional SLD (dysgraphia and/or dyscalculia)	4	23.5%
Auditory processing difficulties	1	5.9%
Processing and working memory difficulties	1	5.9%

Note: ADHD: Attention Deficit Hyperactivity Disorder; ADD: Attention Deficit Disorder; ASD: Autism Spectrum Disorder; SLD: Specific Learning Disorder

Our analysis was explorative, so coding was inductive and occurred at both a semantic (surface meaning) and latent (underlying meaning) level (Phase 2). The first author led this process, reading and re-reading the transcripts, applying code labels, and developing an initial set of themes (Phase 3). Input from the whole research team was sought during a recursive process of reviewing, refining, defining, naming themes (Phases 4 and 5) and report-writing (Phase 6). We provided mothers with a research summary and an invitation to provide feedback before finalising the report.

Analysis

Our analysis developed five themes to address the research aim. **Theme 1: Years in the wilderness: Life before diagnosis** explores mothers' doubts and stress (and later regret) during the years before their child's diagnosis when gut feelings about something being "different" about their child were often assuaged by teachers in addition to responses to diagnosis. Theme 2: **"I struggle at times to see her struggle"** explores mothers' worries (about their child's future and present situation) and secondary distress (e.g., "heartbreak") in relation to their child's school-related struggles. **Theme 3: School struggles: Advocating for our children and managing distress** explores mothers' advocacy role and stress/distress in

response to their child's school struggles (e.g., homework conflicts). **Theme 4: "It's a fulltime job" and a "long slog"** explores workload issues and family dynamics in the context of providing support. **Theme 5: Care for the carer: Social support and coping strategies** explores mothers' perspectives on social support, coping, and views about dyslexia as misunderstood.

Each theme was illustrated with data extracts. Editing of the data consisted of adding punctuation and removing some utterances (e.g., um) to improve readability. Further editing such as the removal of irrelevant details, or providing context, interviewer comments, or combining data from the same participant from different time points is indicated by [].

Theme 1: Years in the wilderness: Life before diagnosis

Several parents described the long journey to receiving a dyslexia diagnosis (Martha: *"it took a couple of years it was a bit of a process"*). Mothers discussed barriers to diagnosis, such as cost, long waiting lists, and teachers/others who assured them that all was well, or told them just to wait, despite their gut feeling that something was different about their child. This pre-diagnosis stage appeared to be a period of stress and self-doubt for many mothers. For instance:

Tess: [describing the years before diagnosis] *"It seems to be like never ending stress or concern about "have we got it right" "what is it?" you know [....] it's gone down the road of testing and more things and then they have realised at last he's dyslexic."*

Relatedly, several parents expressed regret that they had not pursued an earlier diagnosis for their child and, in retrospect, a sense of misplaced trust and/or anger and frustration at early childhood teachers who had disbelieved them or put them off course. For instance, Mary described a difficult journey to her son's (Year 6) dyslexia diagnosis:

"I wish I'd trusted my instincts a bit earlier and got him diagnosed a bit earlier, not that I think it would have had a different outcome, but I think he might have understood some of his frustrations in school earlier than year 6 because I was thinking about it in 3 and 4 and talking to the teachers and they were saying, "yeah he's fine he's fine" and being ignorant at that point I kind of believed them [then later talking about getting the diagnosis] *I did it myself, I went and got some information from the* [service provider] *and I went and got a literacy profile done with them and then went to see a psych and yeah got it all done but the teachers were still saying, "yeah, there's nothing wrong with him."*

There was a sense that parents needed to persevere to get their child diagnosed. Generally speaking, receiving the diagnosis helped mothers to understand and support their child better and was frequently described as a relief. Nevertheless, even after diagnosis, some

expressed periods of doubt and worry about whether they were making the right choices for their child. Several discussed how difficult it is to find information about how best to support children with dyslexia and how they have mostly done this information gathering alone and unsupported. Relatedly, most expressed how even after diagnosis they still face ignorance and misunderstanding from others about what dyslexia entails. For example, Grace expressed frustration that she needed to educate her child's teachers about dyslexia, which she did not perceive to be her "*job*."

Theme 2: "I struggle at times to see her struggle"

Rose: "*If I could just wave my magic wand that* [referring to her daughter's dyslexia] *would be what I'd fix, cos it's the world, if you can't read you can't do anything, you cannot apply for a job, you can't, you know it's hard, it's hard.*"

The mothers we spoke to varied in the extent to which they perceived society to exclude people with learning challenges such as dyslexia. Some, like Rose above, expressed a belief that there are many restrictions ("*if you can't read you can't do anything*") whereas others expressed more optimism about inclusivity in the world beyond school. Nevertheless, most, but not all, acknowledged a degree of permanence about their child's dyslexia. For Cherie, this meant preparing her son for an adult life in a society that is not always accommodating. When asked about how her son's reading difficulties affected her and her son emotionally, she responded:

"*I do feel like sorry for him sometimes that he has to go through these struggles and things like that so that's an emotional thing for us that I do feel, we try our best but he also needs to do his own thing cos he's got to deal with this for the rest of his life even when we get older, he's going to have to find that resilience to keep going.*"

Whilst many mothers expressed concern for their child's future, as above, many also worried about more immediate concerns such as the impact of everyday classroom experiences on their child's self-esteem and mental health. For instance, Cassie remarked: "*It absolutely keeps me up at night, worried most of all about his self-confidence.*" Similarly, Grace, who has more than one child with dyslexia, expressed worry for the future and present situation:

"*I think worry, worry for them in the future. Even simple things like you think about, you think about them getting their license, are they going to be able to read the tests enough to [....] and also, I worry about I guess at school [....] he came home from school the other day and so upset because he heard the child before him read and then he had to read so he can*

see the gap and then you can see the gap and then obviously we get an IEP [Individual Education Plan] *and we can see the gap and so just worry."*

Moving to high school was a worry for mothers. Many expressed concerns regarding the impact that the larger environment (seven teachers rather than one) may have on their ability to advocate for their child at school. For instance, Molly, whose daughter had more than one diagnosed learning difficulty (including dyslexia) said:

"I struggle at times to see her struggle and so I worry about, you know, how she will progress and how school will be for her particularly that she's had, primary school has just been one teacher, one classroom, I can talk to the classroom teacher about interventions and accommodations, you know, multiple times go back to them and get support from them, or not, but there's only one person to deal with."

Some worried about whether their child would be adequately supported, and many expressed concerns about an increase in their child's workload/homework and the impact that will have on the whole family. For instance:

Cassie: *"I am terrified for him and I'm terrified for us because so much of the, so much of the disorganisation or the work that does not get done at school or whatever it may be, comes home and gets dumped on the family table and at the moment I have no idea how big that mountain might be. I do not know what I'm up against, but I know that I'm not going into it* [talking about the move from primary to secondary school] *feeling especially confident."*

In addition to worry, our analysis suggests that mothers experienced secondary distress. As Molly put it, *"I struggle sometimes to see her struggle"* or as Cheryl, below, described it, *"it's hard for him, it's hard for us."* In other words, this suggests that the struggles their children face are not theirs alone but the whole family's struggle. Secondary distress was often expressed as sadness and/or heartbreak, and there was often a sense that this distress prompted parental protectiveness. For instance:

Cheryl: *"It's hard, it's hard for him, it's hard for us, it's also a bit disheartening, because of, well you can see the frustration in [name of child] especially when he's trying to read and how it has caused him to have downfalls in other areas of his education [....] I feel for him because he, he wants to be like everyone else but he just struggles [....] it breaks my heart being so young and having these struggles [....] it just makes me more involved to not let him ever feel like that because even as an adult there's nothing worse and children should not be suffering like that but they do."*

Theme 3: School struggles: Advocating for our children and managing distress

Like Cheryl, several mothers expressed feeling "heartbroken", protective of their child, and/or frustrated and angry if their child is not being treated justly (e.g., being made to stay in at lunchtime to finish work). For instance, in response to her son's (and her own) distress, Grace expressed anger towards her son's school: "*I was really quite angry and really quite, you know, cos we were dealing with distress when he came home, he was upset when he came, he couldn't do it* [referring to unadjusted school-work her son had been given]*.*"

Our analysis suggests that mothers perceived school, with its focus on reading and writing, to be an environment that highlighted their child's difficulties and minimised their strengths. Some, like Rose, had reached the conclusion that systemic issues with the school system (e.g., lack of teacher training) contributed to their children's struggles:

"*It's very frustrating for me because, you know, most teachers do not get it and they do not have the education to educate children who aren't the cookie cutter and it's very, very difficult, it's, I'd say that it's probably been the hardest part of parenting for me* [at another point in the interview] *the Australian curriculum it just does not cater to children who might not be average.*"

Consistent with previous research (see for example, Delaney, 2017; Leitão et al., 2017; Woodcock, 2020), many mothers in our study felt they had to fight, and continue to fight, to have their child's needs recognised and/or met at school; taking on the role of "*pushy parent*" (Christy) even when they did not really feel comfortable doing so. For instance:

Christy: "*I've actually got to be my child's advocate. I have to be that parent now that goes "well what are you doing for my child?" "Why is he doing this subject when he can't do that? he should be doing something else" Yeah, and that's a change, that's a hard shift for me, to be that mother* [laughs]."

There was a sense that mothers needed to maintain their watch regarding the way their children were being treated at school so that things did not get forgotten: *"if you don't advocate for your child, advocate meaning being constantly on their back about whatever and I'm not even very good at it, you get nothing, nothing (Rose)".* Several mothers provided examples of negative events occurring when they did not keep up their watch at school, such as missing out on group interventions that may have assisted their child's learning.

Mothers expressed varying degrees of success with their advocacy. For example, Cassie reported feeling like she had to fight to be heard:

"*It's challenging to go up against a school when, as a parent, I know that something is not right and I'm not going to be able to fix it without their partnership, but they may or may not*

see it the way I see it or be interested or able to help [later in the conversation] *school is driving the process and I am not allowed to be a partner in that, I'm not welcome, I'm generally uninformed, I have to really fight to be heard with things.*"

Similarly, at her son's school, another mother expressed how she did not feel listened to: "*I used to call the meeting, like when we'd do like his IEP* [Individual Education Plan] *meetings at school, his "I need a drink afterwards" meetings cos I'd just feel like I was banging my head against the wall a lot of the time.*"

In contrast, some mothers reported having excellent relationships with their children's school based on frequent and open communication and their concerns/recommendations listened to and acted upon. From our analysis, this sense of school connectedness (feeling included, supported, and respected at school; Libbey, 2004) was an important protective factor for both mothers' and children's well-being (see also, Wilmot et al., 2023a). For example, Karen had moved her son to a new school that focused on "*not just academic*" but also "*emotional well-being.*" She expressed how she could relax her watch a little, trusting her child's new school, because she felt listened to and valued, which lessened her worry: "*I've just relaxed, still get worried but he'll get there, he'll get, we'll all get there* […] *the school, their communications are a lot better than where we were previously and the reassurance as well cos I did also say, "I hope I'm not coming across as annoying by asking 50 million questions all the time" but he said "oh no that's what our job is, if you're happy then the kids are happy.*"

When things are not going well at school, when the pace of the learning is too fast, when the workload is building, and when children have been embarrassed or not treated fairly, mothers discussed how their children release their emotions at home. Managing meltdowns, school refusal, and homework resistance was described by many as a particularly challenging aspect of their parenting, but not one which is the child's "*fault*" (Pru) but rather was perceived as their child's emotional response to school as a poor "person–environment fit" (Mandy, 2019, p. 1880). For instance, Tess explained how her son's school frustrations spilled out into the home environment and how they manage it as a family:

"*Mostly his behaviour is one of the things that we have found really difficult as a family to deal with, he's very angry, and then when he went to school he was sort of OK to go to school so that was good but then it started with "I hate school" [....] "I don't wanna go to school"* [later in the interview] *We just try and explain to him that it's ok to feel frustrated but you cannot be mean to other people because he was really like lashing out at his* [siblings] *and like us and just really screaming and yelling and just quite badly behaved and we just explain*

like we understand that school is hard for you and it's frustrating but you can't be mean to other people."

Many mothers discussed homework conflicts as a particular cause of stress within families: For instance, Pru, whose child has ADHD in addition to dyslexia, described homework as a "*real challenge for the whole house*", which "*puts a lot of pressure on us all.*" Relatedly, Mary expressed her belief that schools ought to re-think homework for children who have learning difficulties - a change at an environment level (adjusting homework demands) rather than expecting children with dyslexia (and their mothers) to just cope. Homework conflicts, when they occur, can also contribute to mothers' distress. For instance: Cheryl: "*Just the arguments that it would cause because he doesn't want to do it* [referring to after school reading homework] *it sort of flows into the mood of the rest of the night [....] I don't like to shout and I don't like to be like that and nor does his dad but it ends up being like that and it's, it's sad because we don't want it to be like that, and cos that can, that can just ruin the whole evening, so yeah, that's pretty much how it gets to so, with just the arguments of trying to read and I guess for me I just feel disheartened and a bit sad that it is so, it is such a struggle."*

Theme 4: It is a "full-time job" and a "long slog"

Cassie [talking about her journey with her son's reading difficulties]: "*There has been no silver bullet [....] there has not been a specific teaching style or a specific action plan or a specific anything that kind of cracks the nut. It's just a kind of a long slog."*

During our conversations, many mothers discussed feeling under pressure, in terms of time, energy, and financially, to support their child. For instance, Christy remarked: *"it's just finding the time, finding the time to fit his homework in, and courses and stuff, and the expense, the expense of it all, and there's no financial help."* One mother described how she is often up late at night to support her child with homework and organisation. Another told us how she had reduced the number of her paid workdays so she had time to manage her child's appointments and supports. One mother who had several children with learning challenges described the cumulative workload and financial consequences (e.g., needing to save money to get other children diagnosed) and another expressed that supporting them all was a "*full-time job.*" Parents who had other children without learning difficulties had other concerns, such as managing sibling dynamics. For instance:

Cassie: "*It's always in the back of my mind and when he needs extra help and extra tutoring and extra driving around, I have to mentally kind of figure out how to keep the equilibrium*

[laughs] *and keep the other kids also engaged and feeling like they are being paid attention to."*

Most families reported having accessed out-of-school support for their child's reading difficulties, in particular, tutoring and speech-language therapy. Whilst this was valued by parents, it came at a cost (time and money). Many mothers expressed disappointment and frustration that schools are not funded to provide support for children with dyslexia, leaving them to manage the shortfall. For example, Trudy referred to this as her "*main gripe*" about raising a child with dyslexia.

We found mothers' perspectives of their child's support at school to be highly variable. For example, one mother reported that her child received daily support with a reading specialist whilst another that support at school was infrequent. Generally, when there is less support at school, parents' workload, in terms of providing academic and organisational support to their children increased, as did the potential for homework conflicts and parental stress and distress. Relatedly, mothers expressed concern for families who were not as well-resourced (time, money, and skills) as them. For instance, Michelle, who had received a relatively early dyslexia diagnosis for her child (Year 2) offered her perspective on the value of timely identification and parental involvement to support children's mental health:

"I think unless you go out and kind of do your own research and advocate for your kid they can get left behind. So, I think it's quite important for parents if they have got a gut feeling or if their kid is struggling then to get down to the what is actually going on cos the longer you leave it their confidence will not be great and then going into high school if they are still struggling and they can't read, that's probably when the mental health and the difficulties get more extreme [….]. Lots of parents I speak to don't know where to start to get help or where to look."

Theme 5: Care for the carer: Social support and coping strategies

Feeling isolated and unsupported, both before and after their child's diagnosis, was a common thread to the conversations we had with mothers. Many mothers expressed that they had limited or no support in their parenting role outside of the family, except perhaps from other parents of children with learning difficulties who "*understand*". For instance:

Cassie [when asked about her own support]: "*That list is very short, possibly non-existent, maybe the mum of this buddy of his* [who also has reading difficulties] *at school is a nice person to sort of chat with and vent too, and we are able to be mutually supportive of one another, but otherwise, I can't, I can't say that, that I know where to go for support or*

encouragement [later in the conversation] *I think if you do not have a child who is living through this, it's very hard to understand."*

Like Cassie, several mothers linked isolation to their perception of dyslexia as poorly understood by people without lived experience. For instance, Christy expressed her opinion that dyslexia is typically regarded as simply an issue with learning and that the socio-emotional aspect is neither considered nor supported. Similarly, Tess described raising a child with dyslexia as "*all encompassing*", more than just reading: "*that's what people don't really, like friends and people like that, they're he's dyslexic and so he can't really read very well or write very well and I'm like well it's everything that goes with that."* Karen, on the other hand, described feeling isolated due to perceptions of dyslexia- related stigma and living in a society that celebrates ability:

"*It is quite isolating I think, from a parent, like, from my own support network, because I know it's out there but parents just don't shout it from the rooftops I suppose, that my kids are struggling at school, it's not something that we talk about when we are waiting for school pick up and things like that, so it's more about all the achievements, that the kids are achieving that we talk about, we don't talk about the struggles really, so that's isolating."* Some mothers described certain health professionals and/or teachers as reassuring and supportive of both them and their child, highlighting that parents as well as children benefit from emotional support.

In addition to social support, mothers discussed a range of cognitive and/or behavioural strategies that helped them cope. For instance, Karen described addressing her "heartbreak" by focusing on her son's strengths rather than ruminating on his challenges:

"*He has said to me "mum how much more can I keep trying and not get anywhere?" and I was like, that was like my "oh this is heartbreaking" and then that's when I thought, you know what, let us not just focus on academic let us try other things and then the* [name of sport] *and he sees his hard work pay off in a shorter time.*"

Judy took hope from her perception of a lessening of social stigma related to learning difficulties and her focus on mental health rather than grades: "*I'm big on the emotional support [....] I'd rather her be happy and fail than be getting As but then be miserable."* Whereas Kate felt optimistic about her daughter's future because of her work ethic and focused on that as well as celebrating how far she has come with her learning:

"*I've said to her "you'll do well with whatever you choose to do this is not going to hold you back, this is just something you'll just have to work at" and fortunately she is that sort of personality that she just works her little socks off, she really does."*

Several mothers discussed the importance of acceptance, both in terms of acknowledging dyslexia as a positive aspect of their child's identity (akin to the definition of "autism acceptance"; Cage et al., 2017) and in terms of "letting go" by adjusting parental expectations. For instance:

Mary: "*The other thing as a parent, I've had to learn to let things go, and it's OK [...] if he just gets through and he passes, actually, that's fine, that's a good thing, because he's still doing what he's trying to do, he still wants to do it but you just have to accept that trying is enough.*"

Whereas Michelle identified how staying positive herself and having a non-stigmatising attitude to dyslexia was crucial for her own and her daughter's mental health:

"*I think not being embarrassed about it [....] that keeps your kid's mental health good as well, cos if you think it's a bad thing and stress about it she will pick that up and be stressed herself yeah, so just try to look on the bright side* [laughs] *I think* [Int: yeah] *yeah, and just keep her positive and willing to try.*"

Concluding Comments

Our aim was to explore the emotional experience of growing up with dyslexia in Australia from parents' perspectives. In so doing, we also developed an understanding of parents' own mental health and support needs informed by their lived experience. Our analysis took a neurodiversity perspective and was guided by Braun and Clarke's reflexive thematic analysis approach (2006, 2013, 2022). This article is a companion piece to another, which focused on children's mental health in the context of dyslexia and included both child and parent perspectives (Wilmot et al., 2023a).

Consistent with findings from research in the broader field of neurodevelopmental differences (see for example, Karande et al., 2009; Kütük et al., 2021; Matteucci et al., 2019) but in contrast to the findings of Bonifacci et al. (2013), our analysis suggests that mothers of children with dyslexia may be at elevated risk for mental health concerns both before and after diagnosis. Specifically, chronic worry and stress, secondary distress, challenges to parenting self-efficacy, and lack of support and understanding (feeling isolated) were highlighted and warrant further investigation in relation to their association with parental mental health.

In terms of maternal stress (and distress), our analysis is largely consistent with previous research (see for example, Carotenuto et al., 2017), but provides nuance regarding the nature and source of parenting stress in the context of dyslexia. Specifically, our analysis suggests that mother's stress and distress were related to witnessing (and managing) their

children's school-related distress (e.g., meltdowns) and compensating (e.g., homework support), or advocating, for any perceived shortfall in their children's education. Importantly, "difficult" child behaviour was perceived as a response to school as poor "person–environment fit" (e.g., inappropriate curriculum/lack of support; Mandy, 2019, p. 1880) and not the child's "*fault*". In keeping with findings from Leitão et al. (2017) in our study, mothers' workloads in terms of being tutor, advocate, and mother, whilst also managing potentially challenging family dynamics, was highlighted as a factor of concern. Transition to high school seemed to be a particularly worrying time for mothers. Many described how their (and their child's) concerns were assuaged by school transition programs; however, there was a sense that a staged transition with an earlier start would benefit families. Future researchers are therefore encouraged to investigate mental health in the context of dyslexia over the transition to secondary school using longitudinal design.

As would be expected based on known levels of co-occurring conditions in developmental dyslexia (see for example, Brimo et al., 2021), many of the children in our research had additional diagnoses, which may account for the socio-emotional difficulties described. Additionally, the age at which children were diagnosed, and the way this facilitated self-understanding and support (or not) was touched upon in our analysis but warrants further exploration. Future research, which specifically interviews parents regarding the road to diagnosis, age of diagnosis, the language used to frame diagnosis, and the impact of this on child and parent well-being, would extend our analysis and that of other researchers (see, for example, Brunswick & Bargary, 2022; Leitão et al., 2017).

In terms of protective factors, our analysis suggests that coping strategies at the community level (e.g., parents' perceptions of school connectedness and support from other parents of children with dyslexia), and at the individual level (e.g., having a neurodiversity mindset characterised by acceptance, focusing on strengths, and non-stigmatising attitudes to dyslexia) may be especially important. School connectedness has been linked to children's mental health during the transition from primary to secondary school (Lester et al., 2013), but appears to be under-explored in the dyslexia field. Similarly under-studied, in comparison to the autism field, is the association between acceptance of one's (or one's child's) neurodiversity and the well-being/mental health of neurodiverse individuals and their families (Cage et al., 2017; Crane et al., 2019; Weiss et al., 2012). Future researchers are encouraged to investigate these factors in association with mental health in the context of dyslexia.

The results of our study are limited in that all participants, except one, resided in one Australian city. Furthermore, the interviews took place during the Coronavirus pandemic in

which Australian families experienced periods of home-schooling/online learning, which is another consideration. Given that isolation was identified as a risk factor for parental well-being, future researchers are encouraged to explore parenting experiences among those living in rural locations and/or those isolated for other reasons (e.g., minority groups) in addition to seeking the views of fathers and siblings. Nevertheless, our analysis has implications for the importance of funding public awareness campaigns (and teacher training) about dyslexia, developing peer support programs for parents of children with dyslexia, and the importance of whole family (parent in addition to child) mental health programs, which support parents' advocacy and promote school connectedness.

In summary, our analysis highlighted the interconnected nature of mothers' and children's well-being. Specifically, mothers' stress and distress related to witnessing their child's school struggles, advocating and compensating for shortfalls in their child's education. Perceptions of school connectedness, and a neurodiversity mindset characterised by acceptance, focusing on strengths, and having non-stigmatising attitudes to dyslexia were highlighted as protective of mother and child well-being. These themes suggest that child mental health programs should consider a parenting component and support parent advocacy and school connectedness. When mothers feel that they (and their children) are understood, respected, and treated fairly at school, whole families benefit.

Chapter 5

Understanding mental health in developmental dyslexia through a neurodiversity lens: The mediating effect of school-connectedness on anxiety, depression, and conduct problems.

Informed by prior research (Study 1) and the conversations I had with children and mothers (Study 2 and Study 3), I developed a hypothesis that poor school-connectedness may explain internalising and externalising mental health concerns among children with dyslexia. From a neurodiversity perspective, poor school-connectedness (at the whole school level) may indicate a system level failure to provide appropriate support for the strengths and challenges of children with dyslexia. The primary aim of Study 4 was to test this hypothesis. To address the limitations of prior research (outlined in Study 1) I gauged the perspectives of both children and their caregivers, and employed measures of specific mental health concerns, namely, anxiety, depression, and conduct problems rather than a generalised measure of psychosocial functioning. Furthermore, I employed a measure of school-connectedness with sub-scales to tap different domains (e.g., teacher-connectedness, peer connectedness, whole school connectedness) of children's school experience, and included a sub-scale to measure children's connectedness to friends. There has been limited past research on children's friendships in the context of developmental dyslexia (Study 1). However, there is burgeoning evidence from my own and others' research that children's friendships may be a particularly salient protective factor for children with dyslexia and other learning challenges (Al-Yagon, 2016; Eissa, 2010; Wilmot et al., 2023a). The following article is currently under review with an international journal. Supplementary materials for this article are provided in Appendix P-V of this thesis.

Wilmot, A., Hasking, P., Leitão, S., Hill, E., Boyes, M. (under review) Understanding mental health in developmental dyslexia through a neurodiversity lens: The mediating effect of school-connectedness on anxiety, depression, and conduct problems.

Attributions

Author	Contribution	Acknowledgement
Adrienne Wilmot	Development of research question and methodology; data collection, management, and analysis; interpretation of findings and manuscript preparation	
Suze Leitão	Assisted with development of research question, methodology, interpretation of findings, and manuscript preparation	
Penelope Hasking		
Elizabeth Hill		
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Abstract

Background: Dyslexia, a neurocognitive difference characterised by poor word-reading, is associated with elevated risk for internalising (e.g., anxiety) and externalising (e.g., aggression) mental health concerns. Identifying mechanisms underlying these associations is a current research imperative. Informed by a neurodiversity perspective, we predicted that poor school-connectedness would mediate links between dyslexia and both internalising and externalising symptoms. **Methods**: Two hundred and eighty-three primary school children (87 with dyslexia) and a corresponding caregiver (95.4 % mothers) completed a battery of well-validated connectedness and mental health measures. Two mediation models (one for child-report and one for caregiver-report) tested direct and indirect effects of dyslexia on mental health concerns (anxiety, depression, and conduct problems) via several domains of school-connectedness. **Results**: As expected, gender and neurodevelopmental conditions other than dyslexia were associated with mental health concerns. After controlling for these variables, there were no direct effects of dyslexia on child or caregiver-reported internalising symptoms or child-reported conduct problems. Dyslexia was associated with both child and caregiver reported anxiety, depression, and conduct problems via low levels of school (but not teacher, friend, or peer) connectedness. **Conclusion:** Children with dyslexia are at elevated risk for poor school connectedness even when school-based relationships are sound. Poor school-connectedness rather than dyslexia, per se, explained children's internalising/externalising mental health concerns. Findings suggest the need for whole school initiatives to support the strengths and challenges of children with dyslexia. This may promote children's school-connectedness and, in turn, their mental health.

Keywords: Neurodiversity, dyslexia, school-connectedness, internalising, externalising, mental health

Introduction

Reading difficulties characterised by poor phonetic decoding, spelling, and reading fluency affect up to 10% of children (Brimo et al., 2021; Castles et al., 2010); a figure that equates to approximately 2-4 children in an average sized classroom. When reading difficulties persist without an alternative explanation a child can be diagnosed with a Specific Learning Disorder (SLD) with impairment in reading, otherwise known as developmental dyslexia (APA; American Psychiatric Association, 2013). Dyslexia is known to be: highly heritable, neurocognitive in origin, persistent across the lifespan, and, frequently co-occurring with other neurodevelopmental conditions (or traits thereof; Brimo et al., 2021; Castles et al., 2010; Frith, 2013; Maughan et al., 2020). Furthermore, dyslexia is associated with a range of psychosocial difficulties, including elevated internalising (e.g., anxiety, depression) and externalising (e.g., conduct problems) mental health concerns, which may (in terms of internalising symptoms) persist into adulthood (Donolato et al., 2021; Francis et al., 2019; Maughan & Carroll, 2006; Nalavany et al., 2011), and worsen educational outcomes such as secondary school completion (Smart et al., 2017). Whilst the evidence for associations between dyslexia and mental health concerns is robust; the reasons *why* are largely unknown (Boyes et al., 2016; Francis et al., 2019). Research of this kind is needed to: (a) support teachers, parents, and others identify children who are more, or less, at risk for mental health concerns; and (b) provide evidence-based targets for mental health programs to support children with dyslexia[4] (Boyes et al., 2016).

Dyslexia through a neurodiversity lens

Dyslexia research is predominantly situated within a 'medical model' which conceptualises neurodevelopmental conditions as 'disorders' characterised by developmental 'delays' or 'deficits' (APA, 2013). Some researchers posit that a medical model of dyslexia may narrow the focus of research and constrain best practices and argue for practitioners and researchers to consider a neurodiversity perspective as an alternative (Rappolt-Schlichtmann et al., 2018). Neurodiversity advocates reject the pathologising of brain-based differences such as dyslexia and autism. Instead, they argue that neurocognitive differences reflect natural human variation (akin to the term biodiversity as it relates to the natural world), to be accepted and respected rather than pathology to be cured (see for example, Blume, 1998;

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[4] Whilst identity-first language has been confirmed as the preference of most autistic people (Kenny et al., 2016) and is consistent with a neurodiversity perspective, the conversation of preferred language has not yet been undertaken with the dyslexic community as far as we are aware. We use person first language (i.e., person with dyslexia) in this article, consistent with the International Dyslexia Association. We would always recommend asking an individual about their preferred language.

Baron-Cohen, 2017; den Houting, 2019; Pellicano & den Houting, 2021; Singer, 1998). If one conceptualises dyslexia as 'just' reading difficulties, then it may be difficult to see how the neurodiversity paradigm applies. However, for many with lived experience, dyslexia extends beyond difficulties with reading (Wilmot et al., 2023b) and is an accepted and integrated aspect of their identity (see for example, Johnson., 2023; Wilmot et al., 2023a).

Taking a neurodiversity approach to dyslexia does not imply that children should not be provided with the opportunity to develop their reading skills (Rappolt-Schlichtmann et al., 2018) nor that research should not continue into the cognitive underpinnings of dyslexia to inform evidence-based reading intervention. Rather, research and intervention should *also* focus on: a) recognising and building children's capacity (e.g., strengths), b) understanding dyslexia as identity, and c) modifying children's environment to support learning and mental health (see for example, Hogan, 2018; Johnson, 2023; Rappolt-Schlichtmann et al., 2018; Wilmot et al., 2023a). From a medical perspective, 'within child' factors are investigated as the cause of mental health concerns (Mandy, 2022). Conversely, from a neurodiversity perspective, mental health concerns can occur when there is a poor 'fit' (Mandy, 2022) between the neurodivergent[5] child and their environment, a notion which can be explored by investigating links between dyslexia, school connectedness, and mental health.

School-connectedness

School connectedness, sometimes referred to as school belonging, is variously defined, but in this study, refers to the quality of a child's attachment to their learning and the people (e.g., teachers, peers) within their school environment (García-Moya et al., 2019; Karcher, 2011; Raniti et al., 2022). School-connectedness has historically been investigated in the context of school drop-out and academic outcomes (see for example, Bond et al., 2007) but there is increasing evidence of its importance to child and adolescent mental health. Importantly, poor school-connectedness predicts the onset of anxiety and depression (Gunnarsdóttir et al., 2021; Raniti et al., 2022; Shochet et al., 2006), meaning that it can be an early warning sign to identify children at risk. Furthermore, school-connectedness is malleable; promising results have been reported from interventions which target school-connectedness amongst autistic students and their peers (Hodges et al., 2022; Shochet et al., 2022) which may also improve mental health (Shochet et al., 2022). School-connectedness is

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[5] We use the definition provided by Pellicano & Den Houting (2021) which defines neurodivergent as referring to "a person or people whose neurodevelopment falls outside of (or 'diverges' from) the range usually considered to constitute 'typical' development" (p. 6; Pellicano & Den Houting, 2021).

usually studied as a multifactor construct, and, often by a measure which taps a child's sense of being valued and supported at school rather than their attachment to school (García-Moya et al., 2019). Nevertheless, researchers who study particular domains of school-connectedness such as perceived support from teachers and classmates (Wit et al., 2011), teacher discrimination (Jiang & Dong, 2020), classroom environment (Shochet & Smith, 2014) and, whole school ethos (Dimitrellou & Hurry, 2019) find consistent results in regards to children's mental health. The consistency of these findings underscores the importance of children's school experience to their mental health.

Dyslexia, school-connectedness, and mental health

To the best of our knowledge no previous study has investigated links between school-connectedness and mental health in the context of developmental dyslexia. This is surprising given cumulative evidence from longitudinal studies that mental health concerns among childen with dyslexia typically start when children start school and may worsen during the primary school years (see for example, Jordan & Dyer, 2017; McArthur et al., 2022; Morgan, 2012; Morgan et al., 2008). Furthermore, aspects of poor school-connectedness such as peer relationship difficulties (Boyes et al., 2019; Singer, 2005) and concepts related to school-connectedness, such as poor reading/academic self-concept (beliefs about oneself as a reader/learner; McArthur, 2022; Terras et al., 2009) are (a) associated with mental health concerns in developmental dyslexia, and (b) posited to be causal mechanisms linking poor reading to anxiety (McArthur, 2022) When interviewed, some children with dyslexia, and their parents, report feeling misunderstood by teachers and/or discriminated in their learning environments (Learned, 2016; Leitão et al., 2017; Wilmot et al., 2023a). These findings suggest poor awareness or application of inclusivity policies at school may undermine school-connectedness. Consistent with this notion, there is evidence that children with learning difficulties and other neurodevelopmental differences such as autism are at elevated risk of experiencing poor school-connectedness both in Australia and elsewhere in the world (see for example, Benassi et al., 2022; Dimitrellou & Hurry, 2019; Hebron, 2018).

Drawing from recent interviews with children and their mothers (Wilmot et al., 2023a, 2023b) and research into school-connectedness among children with learning difficulties broadly (using definitions that include dyslexia; Benassi et al., 2022; Chiappedi & Baschenis, 2016; Dimitrellou & Hurry, 2019; Kopelman-Rubin et al., 2020), we posited that children with dyslexia may be at elevated risk of experiencing poor school-connectedness (peer, teacher and school as a whole), which in turn, may negatively effect their mental health (both internalising and externalising symptoms). Prior research investigating children's friendships

in the context of dyslexia is limited so our investigation of friend-connectedness and links to mental health was explorative.

The current study

Previous studies of school-connectedness have been limited by measures which conflate different domains of school-connectedness (i.e., connection with teachers or peers) within their total scores (García-Moya et al., 2019). Similarly, much past research in the dyslexia field investigates *global* psychosocial functioning rather than *specific* mental health concerns such as anxiety (Wilmot et al., 2023). In order to design evidence-based intervention it is important to identify the *particular* domain of school-connectedness associated with the *particular* domain of mental health. Futhermore, research which differentiates the relative importance of various domains of school-connectedness helps to determine priorities for mental health programs. We posited that *both* child and caregiver perspectives were needed to provide insight into internalising symptoms and some aspects of peer relations (e.g., bullying) which may be difficult for an outsider to accurately assess and/or may vary by context (e.g., school/home; Wilmot et al., 2023ab). Given these factors, the aim of the current study was to investigate school-connectedness as a mechanism underlying links between dyslexia and specific mental health concerns, namely, anxiety, depression, and conduct problems using a tool that differentiated different domains of children's connectedness to school (teacher, school-based peers, and school as a whole). Based on previous literature, and informed by a neurodiversity perspective, we expected both direct and indirect links (via low levels of teacher, peer, and whole school connectedness) between dyslexia and anxiety, depression, and conduct problems from the perspectives of children and their caregivers. Our exploration of friend-connectedness was explorative, so no a-priori predictions were made.

Materials and methods

This research was approved by Curtin University Human Research Ethics Committee (HRE2020-0168) and recruitment via schools was approved by the Education Department of Western Australia. Data was obtained from a larger study on the mental health of children with and without reading difficulties. Informed by a socioecological model (Bronfenbrenner, 1979), this larger study included a battery of measures to assess individual, family, and community-level risk and protective factors for mental health. Inclusion criteria were that children must be in Year 6 (approximately 11 years old; the final year of primary school in Australia) and a caregiver willing to participate. No other inclusion/exclusion criteria were applied. Families of children with dyslexia were primarily recruited via the Dyslexia SPELD

Foundation, a leading West Australian provider of assessment and support services for children with learning difficulties. Families of children without dyslexia were primarily recruited through social media, schools, and word of mouth. Advertisement through schools occurred at the school principal's discretion.

Participants

In total 283 children (*M*age = 139.26 months (11 years 6 months); 87 (30.7% of total sample) with dyslexia and a corresponding parent/caregiver (95.4% mothers) participated in this study. According to Fritz and MacKinnon (2007) with a sample of 283 we were powered to find the proposed indirect effects. One hundred and forty-nine children (52.7%) identified as female; 133 children (47%) identified as male; and 1 child (0.4%) responded "other". Sixty-seven (23.7%) parents reported that their child had at least one neurodevelopmental difference (e.g., ADHD) other than (37; 18.9% of sub-sample) or in addition to (30; 34.5% of sub-sample) dyslexia. This level of co-occurrence between dyslexia and other neurodevelopmental conditions is to be expected (see for example, Brimo et al., 2021). One hundred and ninety-seven schools were represented in the sample. Most participants (91.5%) attended schools in the Perth metropolitan area.

Measures

Dyslexia. At the point of recruitment caregivers reported whether their child had a confirmed diagnosis of dyslexia, or not. In Australia, diagnosis is undertaken according to the Diagnostic and Statistical Manual for Mental Disorders (DSM-5) which stipulates that children must be: (a) school-aged, (b) achieving substantially below same-aged peers on standardised literacy tests despite having had at least 6 months of targeted and explicit literacy intervention, and (c) not have another condition or adversity that can better explain the reading difficulties (APA; 2013). Furthermore, as part of the assessment all children completed the Test of Word Reading Efficiency-Second edition (TOWRE-2; Torgesen et al., 2012). The TOWRE-2 consists of two sub-tests, the test of Sight Word Reading Efficiency (SWE) which measures children's ability to read and pronounce printed words and the test of Phonemic Decoding Efficiency (PDE) which measures children's ability to sound out irregular printed words. For both tests, children are asked to read aloud as many words as possible in 45 seconds and are scored based on the number of words correctly read. Raw scores are standardised according to age-based norms to produce a Total Word Reading Efficiency score per child. Sub-test and Total scores between 90 -110 are regarded as average. The TOWRE-2 is widely used for clinical and research purposes as a diagnostic screener for

dyslexia. Importantly, the TOWRE-2 has been validated for online assessment in samples of Australian school children (Hodges et al., 2019).

Child anxiety and depression were measured by both child and caregiver report with the 15-item anxiety sub-scale and the 10-item depression sub-scale of the 25-item Revised Child Anxiety and Depression Scale (RCADS-Short version and RCADS-25-Parent Version; Ebesutani et al., 2017; Ebesutani et al., 2012). Respondents are asked to rate how often each statement applies to themselves or their child (e.g. item from child anxiety sub-scale *"I worry about things"*) using a 4-point Likert scale (0 = never, 1= sometimes, 2 = often, and 3 = always) with higher scores indicating higher levels of anxiety or depression. The various versions of the RCAD have demonstrated sound psychometric properties in community and clinical samples of children and adolescents (see for example, Becker, S.P., et al., 2017; Lisøy et al., 2022; Piqueras et al., 2017). In our sample, reliability of the sub-scales ranged from α = .82 (depression-parent report) to α = .85 (anxiety-child report).

Child externalising symptoms were measured by both child and caregiver report with the 5-item (e.g., *"I am often accused of lying or cheating"*) conduct problems sub-scale of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). Respondents are asked to respond based on how things have been "over the last six months" on a 3-point Likert scale, "not true", "somewhat true", and "certainly true". Higher total scores represent higher levels of conduct problems. The SDQ is a widely used measure of children's psychosocial wellbeing which has been applied in prior research with samples of children with language difficulties (see for example, Kilpatrick et al., 2019) and reading difficulties (see for example, Boyes et al., 2017). The self-report version of the SDQ is validated for children aged 11-17 years (Goodman, 1997). Reliability in our sample was α = .61 for child report and α = .73 for caregiver report.

Teacher, school-based peers, friend, and school-connectedness were measured by the relevant sub-scales of the child and caregiver versions of the Hemingway Measure of Adolescent Connectedness (HMAC; Adolescent version 5.5; Karcher, 2011). The HMAC purports to assess a child's ability to satisfy their need for connection with both people (e.g., teachers) and places (e.g., school). All sub-scales of the HMAC have items which tap children's involvement and caring within that relationship/context. Both versions contain sub-scales to measure connectedness to: teachers (e.g., item *"I care what my teachers think of me"*); school-based peers (e.g., item *"I like working with my classmates"*; hereafter referred to as 'peers'); and, school as a whole (e.g. item *"I feel good about myself when I am at school"*). The child, but not caregiver, version of the HMAC has a sub-scale to measure

connectedness to friends (e.g., item *"I have friends I'm really close to and trust completely"*) but does not refer to friendships specifically in the school context. Respondents answer how true each item is of them/their child on a 5-point Likert scale, from 1 = not at all true to 5 = very true. Higher sub-scale scores indicate higher levels of connectedness in that domain/context. The HMAC has demonstrated sound psychometric properties in cross-cultural populations of adolescents (Karcher & Sass, 2010; Sass et al., 2011); and is one of the few tools that measures the various aspects of school-connectedness independently (García-Moya et al., 2019). Reliability for the sub-scales in this sample ranged from $\alpha = .76$ (peers-child report) to $\alpha = .87$ (peers-caregiver report).

Procedure

Data were collected between May 2021 and January 2023 by a team of trained research assistants including the first and fourth author. All assessments during 2021 took place in-person but from 2022 onwards, participants could opt for an in-person or online assessment to provide more options for participation and to adhere to coronavirus guidelines. There were no school shutdowns during our data collection period, however, children were required to remain home when they were infectious. Written caregiver and child consent was required before commencing the assessment. The child assessment took approximately one hour (and included administering the TOWRE) and the caregiver assessment took approximately 20-40 minutes. Research assistants remained with the children to read the survey (if needed), answer questions and/or monitor for signs of distress. Children were told they could take a break or stop the assessment if desired. Furthermore, as per the ethical approval guidelines, when clinical levels of emotional difficulties were reported by either caregiver or child then a registered psychologist on the team contacted the caregiver to discuss avenues for support. Child participants received a $15 gift voucher to thank them for their participation.

Analysis strategy

All preliminary analyses were conducted via SPSS v. 28 (IBM Corp., 2021). After a missing values analysis was conducted, descriptive statistics and bivariate correlations between variables of interest were calculated (see Table 5.1). This was followed by two tests (one for child report and one for caregiver report) of direct and indirect effects using JASP v. 0.17.1.0 (JASP team, 2023). In each test, child anxiety, child depression, and child conduct problems were entered simultaneously as outcome variables, dyslexia (*0* = no dyslexia, *1* = dyslexia) was entered as the predictor variable, gender and other neurodevelopmental conditions were entered as co-variates, and the relevant connectedness variables were added simultaneously as mediators. Friend-connectedness was only added to the child test as

caregivers did not report on children's friendships. A bootstrapping procedure (5000 resamples) produced coefficients and bias-corrected confidence intervals for all direct and indirect effects. JASP computes confidence intervals using the bias-corrected percentile method suggested by Biesanz (2010). Significance of direct and indirect effects was indicated if bias-corrected 95% confidence intervals did not overlap 0.

Results

Preliminary Analysis

Little's MCAR test indicated that data was not missing completely at random (X^2 (5413) = 5876.47, $p < .001$). However, given the low level of missing data across variables (≤ 1.4 % on any item), missing values were imputed using expectation maximisation (Tabachnick & Fidell, 2013). Descriptive statistics and correlations between variables of interest are reported below in Table 5.1. Correlations were generally in the expected direction.

In contrast to expectations, dyslexia did not correlate with any of the child-reported mental health outcomes. However, there was a significant correlation between dyslexia and symptoms of depression according to caregivers. Dyslexia was also negatively correlated with school, teacher, and peer (but not friend) connectedness according to children, and school (but not teacher or peer) connectedness according to caregivers. Furthermore, there were negative correlations between many of the connectedness and mental health concerns among children with and without dyslexia. No correlations were strong enough to suggest multi-collinearity. However, gender as well as having any other neurodevelopmental condition (e.g., ADHD) correlated with mental health outcomes, as expected, and were therefore controlled in the tests of direct and indirect effects. In our sample, boys reported significantly higher levels of conduct problems ($M = 2.35$, $SD = 1.81$) than girls ($M = 1.60$, $SD = 1.54$, $p < .001$) whereas girls had significantly higher levels of anxiety by both child and caregiver report ($M = 12.30$, $SD = 7.49$; $M = 8.10$, $SD = 5.52$, respectively) than boys ($M = 10.06$, $SD = 5.71$ $p = .005$; $M = 6.02$, $SD = 4.02$, $p < .001$ respectively).

Table 5.1 Descriptive statistics disaggregated by group (dyslexia and no-dyslexia) and correlations by child (C) and caregiver (CG) report on variables of interest

	Variable	Mean (SD) Dyslexia	Mean (SD) No-dyslexia	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Dyslexia [a]	-	-	-	0.30‡	0.07	-.06‡	0.28‡	0.13*	0.13*	0.02	0.10	0.11	0.11	0.38‡	0.01	-0.08	0.10	0.16†	-0.01
2	Other neurodevelopmental conditions [a]	-	-		-	0.12*	-.29‡	0.20‡	0.13*	0.13*	-0.06	0.11	0.18†	0.19‡	0.31‡	-0.10	0.12*	0.19‡	0.30‡	0.17†
3	Gender [a]					-	-.08	0.21‡	0.23‡	-0.06	0.17†	0.17†	-0.05	0.21‡	0.26‡	0.23‡	0.01	0.21‡	-0.02	0.07
4	Word reading (TOWRE)	81.27 (11.53)	102.81 (13.53)				-	.37‡	.15†	.17†	.10	-.20‡	-.19‡	-.18†	.47‡	.11	.14*	-.18†	-.16†	-.01
5	School connectedness (C)	19.78 (4.00)	22.37 (4.09)‡					-	0.61‡	0.55‡	0.32‡	0.40‡	0.52‡	0.50‡	0.62‡	0.37‡	0.27‡	0.23‡	0.33‡	0.28‡
6	Teacher connectedness (C)	22.41 (4.49)	23.62 (4.21)*						-	0.42‡	0.31‡	-0.11	0.26‡	0.45‡	0.33‡	0.39‡	0.15*	-0.07	0.14*	0.23‡
7	Peer connectedness (C)	20.86 (4.57)	22.03 (4.12)*							-	0.52‡	0.36‡	0.44‡	0.38‡	0.28‡	0.09	0.44‡	0.23‡	0.31‡	0.23‡
8	Friend connectedness (C)	24.30 (4.18)	24.14 (4.78)								-	0.13*	0.18†	0.22‡	0.15*	0.09	0.24‡	-0.11	0.14*	0.13*
9	Anxiety (C)	12.28 (7.49)	10.76 (6.41)									-	0.73‡	0.34‡	0.25‡	0.13*	0.29‡	0.43‡	0.30‡	0.18†
10	Depression (C)	8.51 (4.83)	7.39 (4.48)										-	0.47‡	0.32‡	0.21‡	0.32‡	0.33‡	0.43‡	0.27‡
11	Conduct problems (C)	2.23 (1.83)	1.82 (1.64)											-	0.39‡	0.36‡	0.23‡	0.17†	0.26‡	0.43‡
12	School connectedness (CG)	19.70 (4.20)	23.41 (4.27)‡				.47								-	0.51‡	0.49‡	0.32‡	0.49‡	0.38‡
13	Teacher connectedness (CG)	25.33 (3.78)	25.25 (3.84)				.11									-	0.30‡	-0.05	0.17†	0.29‡
14	Peer connectedness (CG)	19.17 (3.86)	19.83 (3.54)				.14										-	0.49‡	0.53‡	0.42‡
15	Anxiety (CG)	7.85 (5.76)	6.79 (4.55)				-.18†											-	0.33‡	0.31‡
16	Depression (CG)	6.15 (3.98)	4.77 (3.97)†				-.19												-	0.50‡
17	Conduct problems (CG)	1.66 (1.77)	1.67 (1.85)				-.01													-

*Note. (C) = child report (CG) = caregiver report; *p ≤ .05; †p ≤ .01; ‡p ≤ .001; [a] = point-biserial correlations; independent samples t-tests used to assess the significance of mean group differences*

Word reading

In our sample, the mean TOWRE score for children with dyslexia ($n = 87$, $M = 81.27$, $SD = 11.53$) was below the average range (90 -110), and significantly lower than that of children without dyslexia ($M = 102.81$, $SD = 13.53$, $p < .001$, $d = 12.9$).

Test of direct and indirect effects: child report

After controlling for gender and children having a neurodevelopmental condition other than dyslexia, there were no significant direct effects of dyslexia on anxiety, depression or conduct problems reported by children. Further, there were no significant indirect effects of dyslexia on anxiety, depression, or conduct problems operating via teacher, peer, or friend connectedness. However, there were significant indirect effects of dyslexia on all mental health outcomes operating via school-connectedness (see Figure 5.1 below): anxiety ($\beta = 0.11$, 95% CI = [0.06, 0.19], $p < .001$), depression ($\beta = 0.12$, 95% CI [0.06, 0.20], $p < .001$), and conduct problems ($\beta = 0.07$, 95% CI [0.03, 0.13], $p = .004$).

Test of direct and indirect effects: caregiver report

After controlling for gender and children having other neurodevelopmental conditions, there were no significant direct effects of dyslexia on anxiety or depression nor were there any significant indirect effects operating via teacher or peer connectedness on anxiety, depression or conduct problems. However, dyslexia had a significant direct negative effect on conduct problems ($\beta = -0.14$, 95% CI [-0.28, -0.01], $p = .018$) by caregiver report and a significant indirect effect via school-connectedness (see Figure 5.2 below) on anxiety ($\beta = 0.07$, 95% CI [0.03, 0.13], $p = .004$), depression ($\beta = 0.11$, 95% CI [0.06, 0.18], $p < .001$), and conduct problems ($\beta = 0.06$, 95% CI [0.01, 0.14], $p = .014$).

We ran the mediation analyses with reading as the predictor variable. The pattern of effects between reading and anxiety, depression, and conduct problems was broadly similar (se Figure 5.3 and Figure 5.4 in Appendix W).
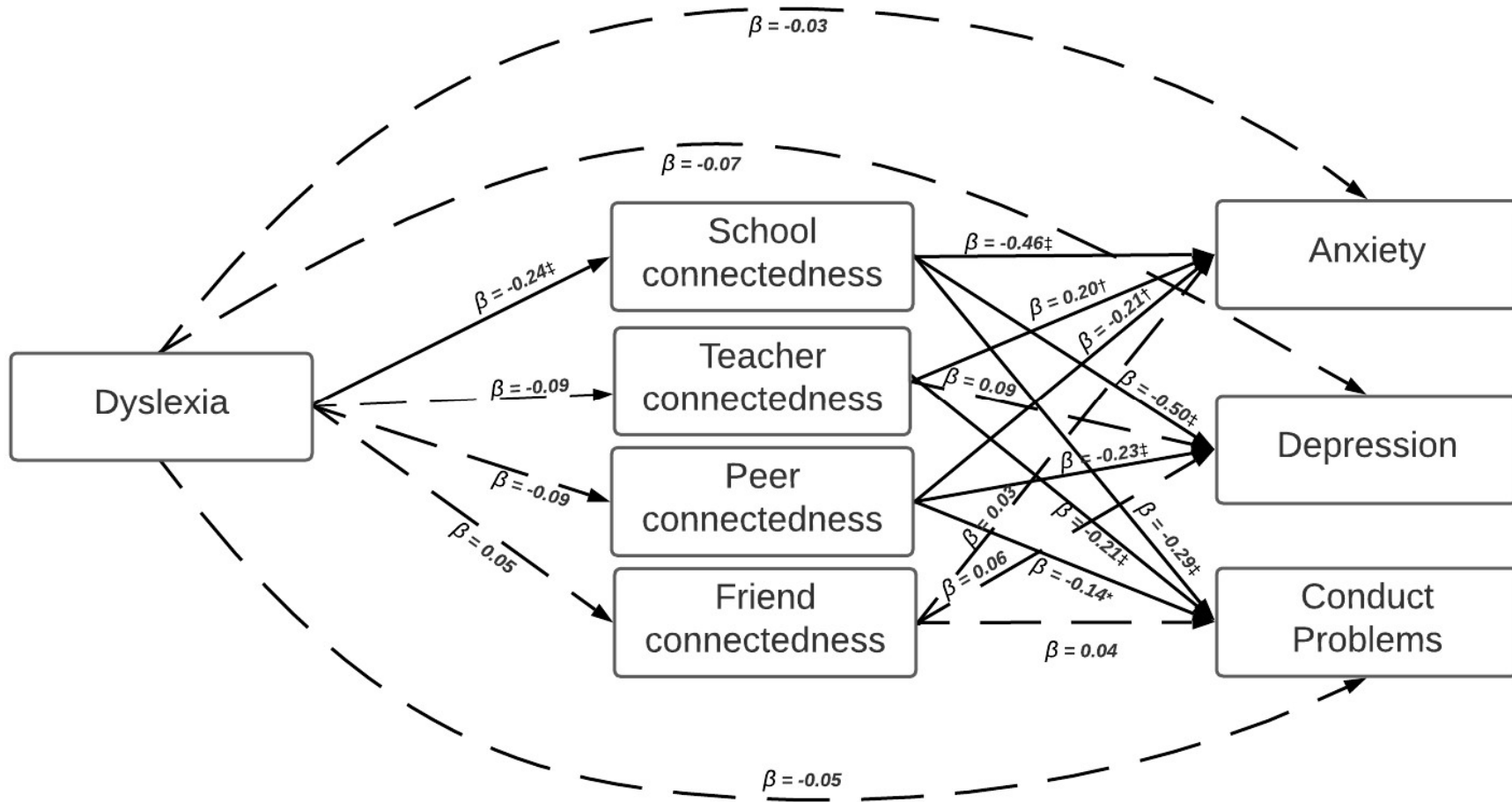
Figure 5.1 Direct and indirect effects by child report

Note: *p ≤ .05; †p ≤ .01; ‡p ≤ .001; dotted line = non-significant effect; solid line = significant effect; effect sizes = $\beta = 0.1 - 0.29$, small; $\beta = 0.3 - 0.49$, medium; $\beta \geq 0.5$, large
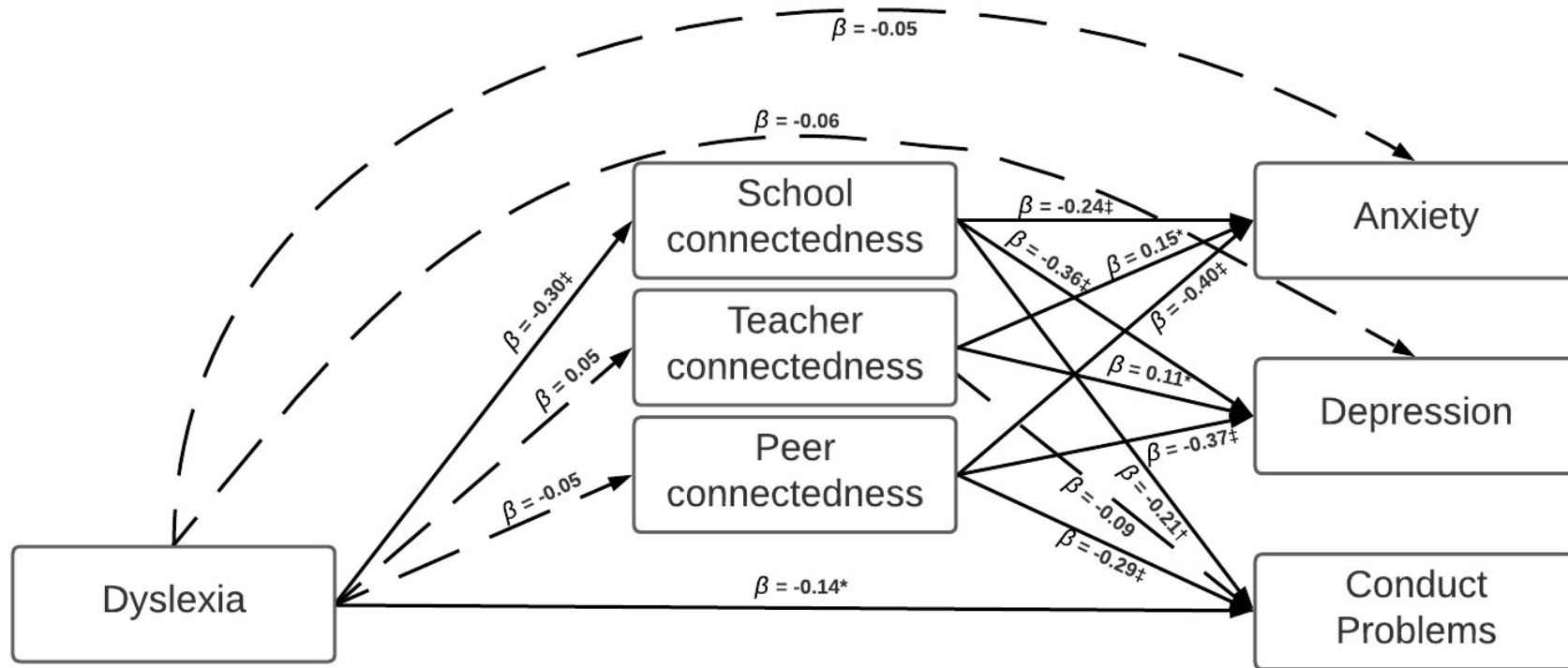
Figure 5.2: Direct and indirect effects by caregiver report

Note: *p ≤ .05; †p ≤ .01; ‡p ≤ .001; dotted line = non-significant effect; solid line = significant effect; effect sizes; β = 0.1 – 0.29, small; β = 0.3 – 0.49, medium; β ≥ 0.5, large

Discussion

Children with dyslexia are at elevated risk of internalising (e.g., anxiety) and externalising (e.g., conduct problems) mental health concerns; the reasons *why* are largely unknown (Boyes et al., 2016). The aim of the current study was to explore school-connectedness as a mechanism underlying links between dyslexia and mental health concerns. Based on previous literature, and informed by a neurodiversity perspective, we expected both direct and indirect links (via low levels of peer, teacher, and whole school connectedness) between dyslexia and anxiety, depression, and conduct problems from the perspectives of children and their caregivers. Our investigation of friend-connectedness was explorative and so no a-priori predictions were made. We took a neurodiversity lens to our analysis which considered mental health in terms of a balance of strengths and challenges, development of a positive dyslexic identity, and the 'fit' of school for children with dyslexia.

After controlling for gender and children having other neurodevelopmental conditions, there were no direct effects of dyslexia on internalising symptoms or child reported conduct problems nor were there any dyslexia-related differences in teacher, peer, or friend connectedness. Furthermore, contrary to expectations, caregivers of children with dyslexia reported fewer, rather than more, conduct problems. However, as predicted, dyslexia was associated with symptoms of anxiety, depression, and conduct problems via poor connectedness to school as a whole, by both child and caregiver report. These findings contrast with research which finds a direct link between dyslexia and internalising symptoms (see for example, Maughan et al., 2003); but are in keeping with those reporting mental health concerns as a *secondary consequence* of reading difficulties and/or the school struggles that often co-occur (Jordan & Dyer, 2017; McArthur et al., 2022; Morgan et al., 2008; Wilmot et al., 2023a). Struggles such as poor academic performance (Singer, 2007), elevated school stress (Undheim et al., 2008; Xiao et al., 2022), and poor academic self-concept (belief about oneself as a learner; McArthur et al., 2020) are highlighted in the literature. Indeed, Australian children with dyslexia, and their parents, describe a poor match between the school curriculum and their strengths and challenges (Wilmot et al., 2023a) and may feel stigmatised in a culture that "privileges perceived ability" (Leitão et al., 2017, p. 331).

The unexpected inverse effect of dyslexia on caregiver reported conduct problems suggests that externalising behaviour in dyslexia may be accounted for by overlaps with other aspects of neurodevelopment. This interpretation is consistent with Maughan and Carroll's (2006) conclusion that attentional difficulties may mediate the association between reading

difficulties and conduct problems. An alternative explanation, given that over 90% of our caregivers were mothers, is that this result may reflect strong mother-child bonds and cooperative relationships forged in the context of dyslexia (see for example, Leitão et al., 2017; Singer, 2007; Wilmot et al., 2023b). When interviewed, mothers contextualise children's externalising behaviour as an emotional release of the stress and frustration that builds through the school day (Wilmot et al., 2023a, 2023b), consistent with a neurodiversity perspective.

Our findings regarding school-based relationships are also unexpected given previous literature implicating peer problems (see for example, Boyes et al., 2019) and poor student-teacher relationships (Alexander-Passe, 2008; Chiapeddi & Baschenis, 2016) in the mental health of children with dyslexia. This finding may signpost an improvement in dyslexia awareness amongst teachers and students and/or highlight interpersonal strengths among some children with dyslexia. It is worth noting that much previous research in the dyslexia field has assessed children's peer relationships from parent/teacher perspectives using measures such as the Strengths and Difficulties Questionnaire, which conflate children's experiences with friends and school-based peers within their total scores (see for example, Jordan & Dyer, 2017; Nathan & Rucklidge, 2011). We would encourage future research to further explore the social strengths *and* challenges of children with dyslexia across school and non-school contexts from multiple (i.e., child, parent, teacher) perspectives. This would inform the design of peer relationship components of future and current mental health interventions for children with dyslexia.

Whilst differentiating friend and peer connectedness is a strength of the Hemingway Measure of Adolescent Connectedness (HMAC) used in this study, it is also important to note the measure's limitations. Specifically, the HMAC does not assess children's perceptions of social support within their relationships. We therefore encourage future researchers to assess the role of friend, peer, and teacher support/understanding (rather than connectedness) on the association between dyslexia and mental health. There is burgeoning evidence that emotional support from these sources may be particularly salient for the mental health of children with learning challenges including dyslexia (Al-Yagon, 2016; Chiappedi & Baschenis, 2016; Wilmot et al., 2023a), perhaps because parents are not available during the school day to support children with school struggles.

A strength of our study was the inclusion of both child and caregiver perspectives and multiple aspects of school-connectedness and mental health. Much previous research in the field has investigated mental health using global measures of psychosocial functioning such

as the Strengths and Difficulties Questionnaire, which conflate externalising, internalising, and social difficulties within their total scores (see for example, Kopelman-Rubin et al., 2020). In contrast, our analysis was able to examine the differential effects of sub-domains of school-connectedness on anxiety, depression, and conduct problems independently. As such, we found that children reported greater effects of poor school-connectedness on internalising symptoms (medium to large effect sizes) than caregivers (small to medium effect sizes); and , that school-connectedness had a greater effect on internalising (small to large effect sizes) than externalising symptoms (small effect sizes) by both child and caregiver report (Nieminen, 2022). Furthermore, we were able to demonstrate that it is connection at the whole school level specifically that is implicated in the mental health of children with dyslexia. From a neurodiversity perspective, this is consistent with the notion of school as a poor 'fit' for children with dyslexia.

Future research is needed to investigate the reasons *why* children with dyslexia are at elevated risk for poor school-connectedness at the whole school level. From a neurodiversity perspective, poor school-connectedness may occur when approaches to learning highlight children's challenges and minimise their strengths (Wilmot et al., 2023a). Interviews with educators reveal that they are aware of the importance of recognising the strengths of children with dyslexia to support their self-esteem (Claessen et al., 2020). However, the balance between targeting children's difficulties and supporting strengths (i.e., capacity building) may not be optimal (Rappolt-Schlichtmann et al., 2018; Wilmot et al., 2023a). Furthermore, whole school approaches which focus on supporting inclusivity, in addition to neurodiversity-affirming teacher practices, may be needed to address school-connectedness (see for example, Carrington et al., 2021; Shochet et al., 2022). Future research to promote school-connectedness in collaboration with school communities is needed, so that all children including those with dyslexia, can feel supported and successful at school. We are aware of projects which aim to promote school-connectedness among students with autism by working at multiple levels (i.e., child, parent, whole school; see for example, Hodges et al., 2022; Shochet et al., 2022). We are also aware of a strengths-based program which aims to develop the self-understanding and self-advocacy skills of children with developmental language disorder to empower them to negotiate accommodations to their learning (Sowerbutts & Finer, 2020). These programs may be suited to (or be adapted to suit) children with developmental dyslexia.

In terms of limitations of our study, it is important to consider the relatively low internal reliability we gleaned from the child-report conduct problems scale. Furthermore,

being cross-sectional by design, we were unable to make conclusions regarding the direction of effects between school-connectedness and mental health. Additionally, we assessed only one type of reading difficulty, developmental dyslexia. There is burgeoning evidence that different sub-types of reading difficulty may be differentially associated with mental health concerns (see for example, Francis et al., 2022). Further, there is evidence from my own research and that of others that receiving a dyslexia diagnosis may support children's mental health (see for example, Ingesson, 2007; Wilmot et al., 2023a). Given this, future research testing whether having a diagnosis moderates associations between reading ability and child mental health outcomes would be beneficial. Future research which replicates our findings among children with different types of reading difficulty and/or when reading difficulties have not yet been formally identified would prove fruitful. Importantly, we would encourage longitudinal research to clarify the direction of effects and fluctuations between children's school-connectedness and mental health over time. This is needed to build theory regarding causal mechanisms for mental health in developmental dyslexia and elucidate the most efficacious timing and focus of dyslexia-specific mental health interventions. Despite these limitations, our research identified poor school-connectedness as a factor to be considered when designing mental health intervention for children with dyslexia and highlighted children's interpersonal strengths (e.g., friend-connectedness) which could be leveraged in mental health support.

Conclusion

Our findings suggest that children with dyslexia may be at elevated risk for poor school connectedness even when school-based relationships are sound. Poor school-connectedness, rather than dyslexia per se, explained children's internalising/externalising symptoms. From a neurodiversity perspective, this finding implies a poor 'fit' between the child with dyslexia and their school environment especially in terms of recognising their strengths and supporting the development of a positive dyslexic identity. Our findings extend previous research regarding links between children's school struggles and mental health (see for example, Benassi et al., 2022) and that which highlights school-connectedness as a protective factor for parent and child wellbeing in the context of developmental dyslexia (Wilmot et al., 2023a, 2023b). Our findings underscore the need to complement individualised mental health support with whole school initiatives designed to promote the school-connectedness of all children, including those with dyslexia and other neurodevelopmental differences.

Chapter 6

General Discussion: Overview of my PhD program of results.

The aim of my PhD was to explore the reasons why reading difficulties are associated with childhood mental health concerns. I defined mental health as consisting of either internalising (e.g., anxiety) and/or externalising (e.g., conduct problems) symptoms and I focused my research on children with reading difficulties consistent with dyslexia. My research program was built on the foundational work of my PhD supervisors who explored mental health amongst children with dyslexia from a socioecological perspective (Bronfenbrenner, 1979). Furthermore, my research was informed by the neurodiversity paradigm; as such, I explored both strengths and challenges, notions of dyslexic identity, and children's mental health within their sociocultural contexts, in particular their school communities. Having a neurodiversity perspective also influenced my methods; specifically, lived experience perspectives were valued and informed theory building.

Three different approaches were included to address the aim of my PhD. First, in Study 1, I scoped the extent and nature of existing studies exploring factors which may influence the association between dyslexia and internalising/externalising mental health concerns. I identified 10 categories at the individual-level (e.g., self-esteem), 9 categories at the family-level (e.g., child-parent relationship), and 7 categories at the community-level (e.g., school-connectedness). I also identified gaps in the literature both in terms of methodological considerations, (e.g., a relative lack of studies gauging children's own perspectives) and understudied factors (e.g., school-connectedness). Second, in Study 2 and Study 3 I gauged lived experience perspectives through interviews with children and mothers. The interviews focused on mental health broadly as well as emotions, coping, support and included a question about the transition from primary to secondary school. I observed that many families had adopted a neurodiversity mindset to support children's self-esteem and frame children's school struggles as poor 'person-environment fit'. I developed a nuanced understanding of the connectedness of mothers' and children's wellbeing and identified 4 plausible mechanisms underlying the relationship between dyslexia and internalising/externalising mental health concerns, namely: (a) poor school-connectedness, (b) stigma and self-esteem, (c) stress and exhaustion, and (d) emotion suppression (concealing emotions) to get through the school day. Third, in Study 4, I tested school-connectedness as a mediator of the association between dyslexia and anxiety, depression, and conduct problems. In this study, I addressed some of the limitations of past research by: (a) gauging both child and caregiver perspectives, (b) using a measure of school-connectedness which differentiated domains of

school-connectedness, and (c) using measures of specific mental health issues (e.g., anxiety) rather than a global measure of psychosocial functioning. Whilst the focus was on school-connectedness (teachers, school-based peers, and school as a whole), I also investigated children's connectedness to friends in relation to their mental health. What follows is an integrated discussion of key findings from all 4 studies with some directions for future research. I conclude this chapter with a discussion of the strengths and limitations of my PhD research program and theoretical, clinical, and educational implications of the research.

<div align="center">**Key findings and directions for future research**</div>

Key finding 1: The social strengths and challenges of children with dyslexia

As reported in my scoping review, social skills deficits and peer problems are among the most studied factors in this field (Wilmot et al., 2023). Descriptions of dyslexia-specific bullying and links to mental health are widely reported, depicting children with dyslexia mostly as victims rather than perpetrators (see for example, Baumeister et al., 2008; Boyes et al., 2019; Singer, 2005; Wilmot et al., 2023). Children's peer relationships tend to be assessed from a problem framework and from parent/teacher perspectives (see for example, Boyes et al., 2019; Russell et al., 2015); their own perspectives of social strengths and challenges are often not considered (Wilmot et al., 2023). This is a limitation given that internalising symptoms and some social difficulties (e.g., bullying) may be difficult for an outsider to accurately assess.

In speaking to children with dyslexia and their mothers, I learned that social skills and friendships were often, but not always, perceived as strengths of the children interviewed (Wilmot et al., 2023a, 2023b). Some dyslexia-related bullying was reported but seemed less prevalent than in past research (see for example, Singer, 2005). Importantly, children highlighted a distinction between children who 'got' dyslexia (i.e., friends) and those that didn't (non-friend classmates who may tease them; Wilmot et al., 2023a); a distinction that cannot be assessed when using measures that combine children's experiences with friends and broader school-based peers within sub-scale scores.

Intrigued by these contrasting findings, I included a measure of friend and peer connectedness in Study 4 of my PhD research program. Whilst there was some evidence that neurodivergent children experienced relatively poorer teacher and peer (but not friend) connectedness than children without any known neurodevelopmental difference, I found no dyslexia-related group differences in teacher, peer, or friend connectedness reported by children or caregivers. This finding aligned with my interview studies to highlight that friendships may be a relative strength of some children with dyslexia and that distinctions

between the way children perceive their friends and other peers may be important in understanding risk/protective factors for mental health. There is evidence from both my own research, and that of others, that social support from teachers and friends may be particularly salient to the mental health of children with dyslexia and other learning challenges (Al-Yagon, 2016; Giovagnoli et al., 2020; Wilmot et al., 2023a, 2023b). This may be due to parents not being available during the school day to support children with their school struggles and/or that friendships may counter academic or broader peer difficulties, like bullying, to improve children's wellbeing at school (Eissa, 2010; Wilmot et al., 2023a).

Future research is needed to further explore the social strengths and challenges of children with dyslexia from various integrated perspectives (e.g., child, caregiver, teacher). Research to investigate the moderating influence of teacher, peer, and friend support (rather than connectedness) on children's mental health is also indicated. These findings would have important implications for the social skills and peer relationship dimensions of current and future mental health programs for children with dyslexia (see for example, Boyes et al., 2020; Francis et al., 2021) and/or socioemotional programs that use a peer mentorship design (see for example, Haft et al., 2019b). Specifically, identifying social strengths (e.g., making friends) provides an opportunity for capacity building which aligns with the principles of neurodiversity affirming practice (Dallman et al., 2022; Rappolt-Schlichtmann et al., 2018).

Key finding 2: Dyslexia, stigma, and self-esteem

Some children I interviewed described the negative effect that their dyslexia had on their self-esteem (e.g., expressed as feeling "*bad*" about themselves) *and* self-efficacy (e.g., "*what's the point in me trying that if I can't do it?*") in the school context, particularly when they compared themselves to peers (Wilmot et al., 2023a, p. 45) . Others showed perseverance in the face of difficulties (e.g., *"I make myself feel better by saying "you can do it";* Wilmot et al., 2023a, p. 47). Many mothers I interviewed expressed the belief that maintaining their child's self-esteem was crucial for children's current and long-term mental health (i.e., a belief that self-esteem is the mediator; Wilmot et al., 2023ab). These findings are consistent with a large body of prior research linking dyslexia to poor reading/academic self-concept (beliefs about oneself as a reader/learner) or poor academic self-esteem (feelings about oneself as a learner) even when global self-concept/self-esteem remains strong (see for example, Gibby-Leversuch et al., 2019; Jacobs et al., 2022; McArthur et al., 2020; Novita, 2016; Terras et al., 2009). Indeed, poor self-concept related to reading or broader academic tasks, is posited to be a causal mechanism linking poor reading to anxiety (McArthur, 2022) and self-esteem has been found to lessen links between childhood reading difficulties and

externalising symptoms (Boyes et al., 2017). Future research is needed to investigate whether academic self-esteem (and related constructs) in the context of dyslexia mediates or moderates links with internalising/externalising mental health concerns and whether this varies by specific types of self-esteem or the aspects of mental health assessed (e.g., anxiety vs depression). Such research would extend the findings of previous research (see for example, Francis et al., 2022) to provide information to better identify children at risk and tailor the self-esteem component of exiting mental health programs (see for example, Boyes et al., 2020).

Current strategies used to address the self-esteem of children with dyslexia may not be effective (see for example the results of a trial of Clever Kids; Boyes et al., 2020). My research, along with that of others, suggests that neurodiversity affirming practices which aim to develop a positive dyslexic identity, thereby addressing stigma (including self-stigma), may be needed to support the self-esteem of children with dyslexia (Gibby-Leversuch et al., 2019; Haft et al., 2023; Wilmot et al., 2023a, 2023b). The families I interviewed were using a variety of strategies to support children's self-esteem. These included facilitating children's strengths outside of the school context (e.g., in sport) so that children could build self-esteem through success. Some families were directing their children to role models of successful dyslexics to widen children's view regarding future possibilities. Another strategy was to support children's understanding of school struggles as a case of poor person-environment fit (i.e., a fish being asked to climb a tree) rather than a reflection of individual-level 'deficits' *("no it's not that your dumb";* Wilmot et al., 2023a, p. 46). Diagnosis framed within a strengths-based framework was considered by some mothers to promote self-understanding, a positive dyslexic identity, and self-advocacy skills which empowered children to discuss their learning difficulties with others without shame (Wilmot et al., 2023a). Talking about dyslexia in terms of having a *different* kind of brain that needed a *different* way of learning, not worse or better, but just different, was a way that some families were supporting children's self-esteem (Wilmot et al., 2023a, 2023b). Future research is needed to investigate links between neurodiversity affirming practices, children's self-esteem (or related constructs), and mental health. This knowledge can then be translated into parenting programs, classroom practices, and the self-esteem components of tailored mental health programs for children with dyslexia.

Key finding 3: The importance of school-connectedness for mental health

Across studies, my findings aligned to highlight school-connectedness (at the whole school level) as an important intervention target for the mental health of children with

dyslexia. In keeping with Bronfenbrenner's (1979) socioecological model and a neurodiversity perspective, the construct of school-connectedness provided an opportunity to assess children's interaction with school. In Study 2 and Study 3 of my research, school-connectedness was explored thematically in terms of children, and their mothers, feeling understood and supported at school. In Study 4 of my research, the tool used to measure school-connectedness tapped children's school-related self-esteem (e.g., item "*I feel good about myself at school*"), school-related self-concept (e.g., item "*I do well at school*"), children's liking of school (e.g., item "*I enjoy being at school*"), and the value they place on doing well at school (e.g., item "*doing well in school is important to me*"). Using this tool, I found that dyslexia was associated with poor school (but not friend, teacher, or peer) connectedness, which in turn was associated with anxiety, depression and conduct problems reported by both children and caregivers. These findings are consistent with research linking poor school-connectedness to anxiety and depression amongst adolescents broadly (for a review, Raniti et al., 2022), and both internalising and externalising symptoms amongst children with learning difficulties specifically (Benassi et al., 2022; Kopelman-Rubin et al., 2020). From a neurodiversity perspective this result implies that school may be a poor fit for many children with dyslexia. Future research to test associations between dyslexia, school-connectedness, and mental health longitudinally is needed to build theory regarding school-connectedness as a mechanism for mental health concerns among children with dyslexia. Furthermore, future research is needed to further explore the reasons *why* children with dyslexia experience poor school connectedness and how this varies dependent on school-level factors such as policies and practices of inclusion. This will inform the design of interventions to target school-connectedness as part of broader programs to improve the mental health of children with dyslexia (for an example from autism research see, Shochet et al., 2022).

Key finding 4: Emotion regulation and mental health in the context of dyslexia

In contrast to past research which presents the school struggles of children with dyslexia mostly in terms of poor academic achievement or difficult peer relationships (e.g., teasing; Singer, 2005, 2007) my research, informed by children's own perspectives, developed an emotional understanding of school struggle in the context of dyslexia. Specifically, children with dyslexia reported feeling stressed/overwhelmed by the pace of learning and the difficulty of tasks, confused about what's going on in class, frustrated by the effect that their dyslexia had on their ability to do their schoolwork, and, for some, embarrassed (indicating shame and internalised stigma) when their differences were made

apparent to peers (Wilmot et al., 2023a). Many mothers I interviewed linked children's internalising/externalising behaviour to their perspective of children being exhausted ("*cooked*", "*cognitive overload*") by the extra effort needed to get through the school day when they have dyslexia (Wilmot et al., 2023a, p. 48). My analysis is consistent with Singer's (2005) observation that children with dyslexia may conceal their emotions at school to protect their self-esteem. However, my analysis extends this to suggest that children with dyslexia may conceal their emotions at school and then release them at the end of the school day in the safety of home via internalising (e.g., crying) and/or externalising (e.g., lashing out) behaviour (Wilmot et al., 2023a, 2023b).

The possibility that children suppress their emotions to get through the school day is concerning given known links between emotion suppression and mental health concerns across the lifespan (Hu et al., 2014; Schäfer et al., 2016) and the importance of emotion regulation for children's social and academic functioning (see for example, Chervonsky & Hunt, 2017; Graziano et al., 2007). Furthermore, this finding is concerning in terms of mothers' mental health. Some mothers I interviewed experienced secondary distress due to witnessing their children's emotional struggles (Wilmot et al., 2023b). Taken together, the findings of all my PhD studies suggest that emotion regulation in the context of developmental dyslexia is under-studied and may be a mechanism linking dyslexia to mental health. Future research to test this hypothesis is needed using methods that can differentiate children's emotion regulation needs and strategies within school and non-school contexts. From a socioecological and neurodiversity perspective, it is important to investigate changes at an environmental level (and not just at the individual level which is the focus of much emotion regulation research; see for example, Boyes et al., 2018; Nathan & Rucklidge, 2011) to support children's emotion regulation at school and/or reduce the barriers to learning which may result in heightened frustration. Future research to investigate associations between school-related stress, exhaustion, and mental health is also indicated by my research. This theme aligned with current knowledge regarding associations between 'masking' and mental health concerns among autistic people (see for example, Higgins et al., 2021; Hull et al., 2021; Phung et al., 2021; Wilmot et al., 2023a) which warrants further investigation in the context of dyslexia and other neurodivergent children.

Key finding 5: The connectedness of mother-child wellbeing in the context of dyslexia

During my interviews with families, I developed an understanding of the connectedness of mother and child wellbeing in the context of developmental dyslexia (Wilmot et al., 2023b). Before diagnosis, some mothers perceived that their gut feelings about something

being 'different' about their child were challenged by others (e.g., early childhood educators, family members) in a way that might undermine parenting self-efficacy (Wilmot et al., 2023b). Furthermore, even after diagnosis, some perceived themselves to be isolated due to dyslexia being widely misunderstood and/or stigmatised in a society that celebrates academic ability (Wilmot et al., 2023b). Mothers described experiencing heartbreak due to witnessing their child's struggles and stressed due to the many additional roles (e.g., advocate, tutor) they have when parenting a child with dyslexia (Wilmot et al., 2023b). Relatedly, knowing the importance of their support to their child's wellbeing, some mothers expressed concern for the mental health of children whose caregivers did not have the resources (e.g., time, knowledge) to support their child at school and beyond (Wilmot et al., 2023a, 2023b).

These findings are in keeping with prior research exploring mothers' experiences of raising children with dyslexia (DeBrew, 2017; Delaney, 2017; Earey, 2013; Leitão et al., 2017; Woodcock, 2020) and other neurodevelopmental conditions such as autism (see for example, O'Hare et al., 2023). They are also consistent with prior research highlighting the importance of having supportive parents who understand dyslexia, for children's mental health (see for example, Singer, 2007; Terras et al., 2009). Taken together, these research findings underscore the importance of addressing parental mental health when considering the mental health of children with dyslexia. Parental mental health has been addressed as part of multi-tier (chid, parent, school) programs to support the mental health of autistic children (see for example, Shochet et al., 2019; Shochet et al., 2022). However, to the best of my knowledge, there is no equivalent program for parents of children with dyslexia. Future research to investigate the feasibility and efficacy of a parent/caregiver adjunct to mental health programs for children with dyslexia is indicated. By supporting caregivers with their emotional wellbeing *and* with their school-based advocacy, whole families may benefit.

Strengths and limitation of my PhD program of research

The strengths of my PhD program of research included incorporating: (a) both child and parent perspectives, (b) qualitative and quantitative design, and (c) well-validated measures of specific aspects of child connectedness and specific aspects of mental health. Furthermore, the neurodiversity paradigm provided a useful framework which aligned with the way many families I interviewed conceptualised dyslexia and facilitated comparisons between autism and dyslexia research. I was fortunate that the COVID pandemic had limited impact on my data collection (just a later than expected start), and I enjoyed the process of exploring my research question broadly, through Study 1 to Study 3, to inform the aim of Study 4 and directions for future research. Nevertheless, data from the scoping review and

interviews raised several plausible risk/protective factors for mental health that remained untested in my PhD. Specifically, I would encourage future researchers to explore: (a) stress/exhaustion, and (b) emotion regulation/coping as mechanisms linking dyslexia to mental health concerns.

The neurodiversity paradigm

When I first began reading in this field, I was struck by how few researchers drew from research in the autism or ADHD field to investigate mental health among children with developmental dyslexia. In addition to being lifelong, brain-based conditions which are frequently co-morbid (suggesting shared cognitive underpinnings), dyslexia has a similar social history to that of other neurodevelopmental conditions (Kirby, 2020). For example, like autism and ADHD, dyslexia can be considered a hidden disability: As such, its presence can be disbelieved or discredited by social commentators or people within a child's sphere of influence, such as teachers (Kirby, 2020; Riddick, 1995). Consistent with this, many families I interviewed described feeling isolated due to dyslexia being widely misunderstood and stigmatised in a society which celebrates ability. Taking a neurodiversity perspective to this research widened my lens to consider children's rights and societal factors (e.g., dyslexia-specific stigma) that may influence mental health. For example, many mothers I interviewed expressed feeling exhausted by the relentlessness of advocating for their child at school (Wilmot et al., 2023b). From this perspective, supporting families with their school-based advocacy and empowering children to self-advocate are a priority for mental health, as is working to promote broader community understanding, acceptance, and respect for neurodiversity.

In taking a neurodiversity perspective, my attention widened to consider children's strengths in addition to their challenges. I observed that much prior research in the field has been deficit-focused and that children's own perspectives on their strengths *and* challenges have been rarely assessed. In terms of children's strengths, my research is consistent with the view that children with dyslexia have individual rather than dyslexia-specific strengths (for a commentary of this debate see, Johnson., 2023). For example, some children I interviewed had strengths in interpersonal skills and being a great friend, others had a talent for a particular sport or creative pursuit. Identifying and facilitating children's strengths outside of school to maintain self-esteem was a high priority for the families that I interviewed. From a neurodiversity perspective, identifying and facilitating children's strengths *within* school contexts should also be a priority (see for example, Armstrong, 2012). However, many of the families I interviewed perceived school to be an environment which highlighted their

children's difficulties and minimised their strengths, and some linked this poor fit to their child's mental health concerns (Wilmot et al., 2023a).

Incorporating child and caregiver perspectives

Having a neurodiversity perspective also influenced my methods. Specifically, lived experience was valued and informed theory building. When I conducted the scoping review, I identified that children's voices have largely been absent from research about mental health in the context of developmental dyslexia (Wilmot et al., 2023). My research demonstrated that children with dyslexia often have good insight into factors that affect their mental health. Furthermore, I demonstrated that children's perspectives may complement, or diverge from, the perspectives of caregivers and teachers and are therefore needed to gain a more complete understanding of mental health concerns. Importantly, by combining child and caregiver perspectives across my research, I was able to build a nuanced understanding of emotional experience in the context of dyslexia (i.e., the build-up of negative emotions at school and the release of these emotions at home), and the crucial role of mothers in supporting children's self-esteem and school-connectedness. Despite advertising for any caregiver to be involved in this research only mothers volunteered for the qualitative studies, and 95.4% of caregivers who participated in the quantitative component were mothers. It would be interesting for future research to explore why this is the case, and to seek the perspectives of fathers.

Incorporating both qualitative and quantitative design

I began this PhD program of research with little experience of qualitative design but high levels of motivation to learn. Braun and Clarke's (2006, 2013, 2022) reflexive thematic analysis approach was a good fit to my neurodiversity worldview and the aims of Study 2 and Study 3. Specifically, rather than seeking lived experience to test pre-existing theory, reflexive thematic analysis provided a vehicle for me to broadly explore the emotional experience of growing up with dyslexia from the perspective of children and mothers, and thereby begin to develop theory. By combining methodologies (i.e., qualitative, and quantitative design) I was able to develop an understanding of the importance of school-connectedness for the mental health of children and their mothers. The findings from Study 4 highlighted the possibility that poor school connectedness acts as a mechanism linking dyslexia to mental health concerns. Data from interviews with children and mothers provided context to this finding. For example, one mother I interviewed said she felt that school support was "*paramount*" (Wilmot et al., 2023a, p. 49). Another family had moved schools to one which provided "*not just academic*" but also "*emotional support*" (Wilmot et al., 2023b,

p. 144) and when children were asked about their dyslexia they provided insight into a range of everyday classroom difficulties related to learning (Wilmot et al., 2023a).

Strengths and limitations of the measures

The measures chosen for Study 4 of my program of research were both a strength and a limitation. The Hemingway Measure of Adolescent Connectedness (HMAC) used in Study 4 of my research provided a domain-specific measure of school connectedness with both child and caregiver versions. Thus, I was able to identify that poor connectedness at the whole school level is implicated in the mental health of children with dyslexia. However, although I assessed different aspects of mental health, I used a global measure of anxiety which may not capture specific aspects of anxiety that may be particularly relevant for children with dyslexia (e.g., anxiety related to school and/or reading; see for example, Francis et al., 2022; Haft et al., 2019a). This may explain why dyslexia was not directly associated with anxiety in Study 4. Future research looking at additional aspects of anxiety (e.g., anxiety specifically related to school and/or reading) may be an important next step.

Dyslexia or reading difficulties?

Many researchers in this field investigate links between reading difficulty (rather than dyslexia) and mental health (see for example, Boyes et al., 2017; Francis et al., 2022). In contrast, I focused my research on children with a confirmed diagnosis of dyslexia. Dyslexia was the preferred term of many of the families I interviewed and is consistent with a neurodiversity perspective. Focusing on reading difficulties does not account for the possibility that a child with dyslexia can compensate for underlying neurocognitive difficulties; learning to read at age-appropriate levels albeit with more cognitive effort (Frith, 2013; Livingston & Happé, 2017). Furthermore, doing so doesn't capture the lived experience of children with dyslexia, specifically, the extent of the challenges commonly experienced (which go beyond reading difficulties) nor their strengths.

Upon reflection, I believe that sampling in this way was both a strength and limitation of my research. There is evidence from my own research and that of others that receiving a dyslexia diagnosis may support children's mental health (see for example, Ingesson, 2007; Wilmot et al., 2023a). Reading difficulties exist along a continuum, even though severity of reading difficulties does not appear to be related to mental health concerns (Donolato et al., 2021; Snowling et al., 2020). Furthermore, reading difficulties are heterogenous; some children have difficulty with reading fluency, some with reading accuracy or reading comprehension, and different sub-types of reading difficulty may have differential associations with mental health (Francis et al., 2022; McArthur & Castles, 2017). Future

research which replicates my research amongst groups with different types of reading difficulties, or when reading difficulties have not yet been identified, is needed. Furthermore, future research which explores family's journeys to diagnosis, age of diagnosis, the language used to frame diagnosis (e.g., a neurodiversity affirming approach or not), and associations with children's mental health would extend my analysis and that of other researchers (see for example, Brunswick & Bargary, 2022; Leitão et al., 2017; Wilmot et al., 2023a, 2023b).

Cross-sectional design

Data for Study 4 of my research was cross-sectional and the sample were children who were all at the same stage (Year 6) of their schooling. As a result of the cross-sectional design, no conclusions about the direction of effects between dyslexia, school-connectedness, and mental health concerns could be made. To extend the findings of this study, I encourage future researchers to use longitudinal designs to test bi-directionality and fluctuations between children's school-connectedness and mental health over time. Such research would contribute to building theory about school-connectedness as a mechanism underlying links between dyslexia and mental health concerns and inform both the timing and content of mental health intervention. Tracking children during the transition to secondary school and beyond is needed. This is a period of children's schooling which coincides with adolescence, a known risk period for the onset of several mental health concerns (Lawrence et al., 2016). The transition to secondary school may be a risk period for both school-connectedness and mental health (see for example, Lester et al., 2013; Rossiter et al., 2018) and may have particular relevance for children with dyslexia and other learning challenges due to perceptions of increases in workload and the difficulty of reading, amongst other factors (see for example, Giovagnoli et al., 2020; Horbach et al., 2020; Wilmot et al., 2023a, 2023b).

Theoretical, clinical, and educational implications

The results of the qualitative and quantitative components of my research aligned to highlight the importance of school-connectedness for the mental health of children with dyslexia. I did not find direct relationships between dyslexia and parent or child reported internalising symptoms or child reported externalising symptoms. Rather, poor school-connectedness mediated links between dyslexia and both internalising and externalising mental health concerns. From a neurodiversity perspective, this suggests that the strengths and challenges of children with dyslexia may not be appropriately accommodated at school and/or that schools need support to improve the inclusion of diverse learners. My finding is consistent with current theory regarding academic self-concept as a mechanism linking poor reading to anxiety (McArthur, 2022). However, my research (a) highlighted that both

internalising and externalising symptoms may be associated with children's school struggles, and, specifically through Study 2 and Study 3, (b) developed understanding regarding the intersections between academic self-concept, dyslexia-specific stigma, and school connectedness, and (c) the possible protective function of having a neurodiversity mindset and focusing on children's strengths.

In speaking to families, I learned that many children with dyslexia already had strengths in making friends, coping at school, and regulating their emotions. From a neurodiversity perspective, it is important that strengths are recognised by the adults (i.e., parents, teachers) in children's lives. The problem for many children I interviewed did not appear to be that they lacked emotion regulation skills but rather that they didn't, or couldn't, use their strategies at school when most needed (Wilmot et al., 2023a). Similarly, the problem for many children did not appear to be that they lacked friendships, rather that other children, who didn't '*get*' dyslexia may tease them (Wilmot et al., 2023a, p. 45). When asked how they cope at school, many children related how they 'just get on with it' or words to that effect (Wilmot et al., 2023a, p. 47). However, their mothers described after school meltdowns in response to exhaustion or a build-up of stress and frustration during the school day. So, in addition to supporting children with their socio-emotional skills if needed, changes at the environmental level are indicated by my research. In particular, environmental changes that support children's emotion regulation (i.e., providing regular emotion regulation breaks during the school day), their academic self-esteem/school-connectedness, and other's (teachers, peers) acceptance and respect for neurodiversity. Current dyslexia-specific mental health interventions focus on developing children's socioemotional skills (Boyes et al., 2020) or directly targeting reading and anxiety (Francis et al., 2021). In contrast, my research suggests the importance of: (a) developing multi-tier (child, parent, school) approaches to mental health, and (b) the benefits of neurodiversity-affirming practices. A once off workshop to support children's self-esteem is unlikely to have a sustainable effect if children's everyday schooling experiences undermine a positive perception of themselves as learners.

Supporting the child

Universal mental health programs for children which assume age-level literacy skills may not be accessible for children with dyslexia. Furthermore, mental health programs of this kind are not dyslexia or neurodiversity specific; meaning that they don't promote children's understanding of the strengths and challenges of dyslexia. The findings of my research suggest that mental health programs for children with dyslexia which build a positive dyslexic identity (thereby addressing self-esteem), support emotion regulation/coping and

school-connectedness as part of a multi-tier intervention may prove fruitful. Teaching children self-advocacy skills may be one approach to improve their school-connectedness.

Once diagnosed, Australian children with dyslexia are entitled to 'reasonable adjustments' to their learning such as extra time to complete tasks (The Autralian Curriculum, 2023a; Dyslexia SPELD Foundation, 2022b). Reasonable adjustments and other accomodations are often articulated in an Individual Education Plan (IEP) which has the aim of providing person-centred support (Australian Alliance for Inclusive Education, 2023). Unfortunately, some mothers I interviewed described the process of negotiating and updating an IEP as frustrating and there was a sense that the value of the IEP was greatly influenced by variability in knowledge about dyslexia amongst school staff (Wilmot et al., 2023b). Futhermore, the question of appropriate support is complicated by the fact that some children are reluctant to receive support that makes them stand out to peers (Jacobs et al., 2022; Wilmot et al., 2023a). For this reason, having children involved in their own IEP decision-making process should be encouraged. Two of the youngest children involved in my project were active self-advocates at school. This suggests that self-advocacy skills can be taught to children at an early age. One method to empower children to self-advocate is through the use of a child-friendly version of an IEP called a 'passport' or 'communication passport'. An example of a communication passport is provided in Sowerbutts and Finer's (2020) program for children with developmental language disorder (p. 111). Children can develop their own passports with input from parents and teachers. Importantly, the passport can include children's strengths, challenges and needs and be carried with the child from class to class to support their self-advocacy.

Supporting caregivers

Current dyslexia-specific mental health programs include caregivers only as a resource to support the generalisation of children's learning (see for example, Boyes et al., 2020; Francis et al., 2021). The findings of my research, and that of others, suggest the importance of providing a caregiver adjunct to children's mental health programs which focuses on parents' mental health, self-efficacy, and support for school-based advocacy is needed. This would need to be designed in collaboration with the dyslexia community. Nevertheless, an example of such a program from autism research provides a model.

In Australia, autistic children and their families face many of the same challenges in terms of school-connectedness and child/parent mental health (see for example, Clark & Adams, 2020; O'Hare et al., 2023). Over the last 8 years, researchers working with the Australian-based Cooperative Research Centre for Living with Autism (Autism CRC) have

developed and trialled a prototype of a multi-tier (child, parent, teacher, and whole school) strengths-focused resilience program to address autistic adolescents' mental health by targeting: (a) children's self-esteem, coping and emotion regulation; (b) parent self-efficacy, mental health and family functioning, and (c) school-connectedness (Carrington et al., 2021; Shochet et al., 2019; Shochet et al., 2016; Shochet et al., 2022). The parent component consists of 4 workshops to: (a) identify existing parenting strengths, explore parenting stress, and the efficacy of calm parenting; (b) address stress management for parents and strategies for promoting adolescent connectedness at home and school; (c) support family functioning and discuss the important role parents play in adolescent development, and, (d) develop conflict management strategies for promoting adolescent-parent connectedness and reflections of personal growth as a parent of an autistic child (Shochet et al., 2019). Importantly, when the program was evaluated, parents reported that the intervention reduced their sense of isolation, and increased their parenting self-efficacy, wellbeing, and the quality of their relationship with their child (Shochet et al., 2019). Furthermore, as part of a multi-level program (see below for a description of the whole school component) this parent adjunct contributed to improvements in adolescent's self-reported school connectedness and mental health (Shochet et al., 2022). The success of the multi-tier program, according to the researchers, was in part due to its strengths focus which aimed to minimise or reduce stigma (Shochet et al., 2022). The findings of my research suggests that such an approach may also support families of children with dyslexia.

Whole school approaches to promote school-connectedness

The findings of my research highlight the importance of researchers working with schools to target school-connectedness. In the United Kingdom, the British Dyslexia Association has a long history of working with schools to promote dyslexia-friendly policies and practices which aim to support *all* students (Pavey, 2015; Riddick, 2006). In terms of an Australian example, the whole school component of the Autism CRC project, described above, had two components to address school-connectedness, and provides another model for future endeavours of this kind. Firstly, teachers in participating schools were offered workshops to address: (a) knowledge of the importance of school-connectedness for mental health in the context of autism, and (b) practical strategies for promoting school-connectedness (warm student-teacher relationships, student inclusion, the identification and encouragement of students' strengths, and equity and fairness) (Shochet et al., 2022). This was augmented with a whole school intervention in which researchers worked alongside members of the school community (including students and parents) using the Index of

Inclusion (Booth & Ainscow, 2011; Centre for Studies of Inclusive Education, 2023; Shochet et al., 2022). The Index of Inclusion is a tool which has been designed to support schools through a process of review and refinement of their policies and practices of inclusion (Booth & Ainscow, 2011; Carrington al., 2023).

Universal design for learning. In Australia literacy skills are built into every aspect of the school curriculum (Australian Curriculum, 2023b). The findings of my research suggest that this can act as a barrier to learning for children with dyslexia which may undermine their connectedness to school, and in turn, their mental health. Universal Design for Learning (UDL; Capp, 2017; Levey, 2023) is an approach to curriculum that aims to reduce or eradicate 'construct irrelevant barriers'[6] to learning and accommodate the learning needs of the widest range of learners possible (Capp, 2017; Levey, 2023; Rappolt-Schlichtmann et al., 2018). In keeping with the social model of disability, the premise of UDL is that barriers to learning occur in the interaction between a student and the curriculum, not within the student themselves (Rappolt-Schlichtmann et al., 2018). There are three core principles to UDL: multiple means of representation (principle 1), multiple means of action and expression (principle 2), and multiple means of engagement (principle 3; Capp, 2017; Centre for Applied Special Technology, 2023; Chen et al., 2023). Within classrooms, this means that teachers are encouraged to present learning materials in multiple formats (e.g., video, audio, text; principle 1) and students are offered multi-modal (e.g., record, draw, type) avenues to engage with and demonstrate their learning (principles 2 and 3). Text to speech and speech to text technology, scaffolded literacy tasks, and offering students a choice of reading materials to align with their strengths/interests are examples of approaches to support children with dyslexia and their classmates (Rappolt-Schlichtmann et al., 2018).

UDL is being adopted within some Australian tertiary institutions (see for example, Cumming & Rose, 2022) and encouraged within the school context by the Australian Curriculum Assessment and Reporting Authority (Capp, 2017, 2020). Recent research suggests that Australian teachers are positively disposed to UDL although they may express attitudes which conflict with UDL principles (Chen et al., 2023) and/or lack confidence with some aspects of its implementation (Capp, 2020). This highlights the importance of embedding UDL in teacher training programs and professional development. There is some evidence that UDL improves the learning process and academic outcomes for students with

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[6] Rappolt-Schichtmann (2018) defines a construct irrelevant barrier as a barrier which is "tangential to the targeted skills and presents enough challenge that the learner is either unable or unwilling to work on that skill" (p. 867).

and without learning difficulties (Capp, 2017; King-Sears & Johnson, 2020; Rappolt-Schlichtmann et al., 2018). Further research to explore whether UDL supports the socioemotional wellbeing of children with dyslexia would prove fruitful.

Conclusion

Through my PhD program of research, I found that mental health concerns among children with dyslexia were related to their school struggles. Specifically, dyslexia was associated with anxiety, depression, and conduct problems via poor school-connectedness. Children described their school struggles in terms of being overwhelmed by the workload, stressed by the pace of learning, confused about what's going on in class, frustrated and/or annoyed by the impact that their reading difficulties had on their ability to do their work, and, for some, embarrassed when their difficulties were made apparent to peers. Some described how their dyslexia contributed to poor academic self-esteem and poor academic self-efficacy, especially when they compared themselves unfavourably to peers. Having a neurodiversity mindset and focusing on children's strengths were ways that some families were supporting children's self-esteem. Nevertheless, many families perceived school to be an environment which minimised their child's strengths and highlighted their difficulties. Future research to test associations between dyslexia, school-connectedness, self-esteem, emotion regulation/coping, exhaustion/stress and mental health over time is needed to extend the findings of my research and contribute to building theory regarding mechanisms to mental health concerns in the context of developmental dyslexia.

Taken together, the findings of my research indicate the need to complement individualised mental health programs with whole school programs to promote school connectedness among children with dyslexia. Adjuncts to child mental health programs which support parenting self-efficacy, mental health, and school-based advocacy is also indicated. UDL is a promising approach to curriculum which may reduce the perceptions of children with dyslexia of being 'fish being asked to climb trees' at school.

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Appendix A

Chapter 2 Changes to the protocol and inclusion/exclusion criteria

1. Changes to title and objective/aim of the review: We removed reference to "risk and protective factors" in the wording of the title and the objective/aim of the review to better reflect the broad range of studies included.

2. Changes to the inclusion/exclusion criteria: We decided to exclude studies which measured reading as a continuous variable for feasibility reasons. The focus of our review is children with developmental dyslexia rather than other types of reading difficulty (e.g., difficulty with reading comprehension). For this reason, we specified dyslexia or word-reading difficulties in our inclusion criteria. Further refinement to the inclusion/exclusion process occurred by group consensus during the source selection process. Specifically, we decided to exclude studies which measured mental health specifically within the context of the COVID-19 pandemic, as well as past reviews, intervention studies, and all "cognitive" third factors such as a child's Theory of Mind ability and their executive functioning.

3. Changes to the source selection process: Due to feasibility reasons approximately 20% of sources selected for full text review and 20% of data extraction was independently screened by a second author. We used Excel spreadsheets in addition to Endnote to manage the source selection process, as this method facilitated better sharing of sources between the review team.

4. Changes to data extraction form: We made some changes to the data extraction form by group consensus during the source selection/data extraction process. Specifically, we removed reference to strengths and limitations of each study and suggestions for future research and added a column to describe the context of the study and the "third factor" included in the study.

Appendix B

Chapter 2 Keyword search terms

The keywords in bold were added after the first stage of the search.

Child* or teen* or adolescen* or youth or young

AND

dyslexi* or "poor reader*" or "reading abilit*" or "reading skill*" or "reading achievement"
or "reading difficult*" or "reading disorder*" or "reading impair*" or "reading delay" or
"reading defici*" or "reading disabilit*" or "literacy difficult*" or "learning disorder" or
"struggl* adj3 read*"

AND

internali?ing or "somatic complaint*" or anxious or anxiety or depression or depressed or
"emotion* difficult*" or "emotion* problem*" or psycho?social or socio?emotion* or
withdrawn or "mental health" or hyperactiv* or impulsiv* or externali?ing or "conduct
problem*" or "behaviour* problem*" or "behavior* problem*" or aggress*

Appendix C

Chapter 2 Example of a whole database search

APA PsycInfo <1806 to July Week 1 2021>

#	Query	Results from 11 Jul 2021
1	(Child* or teen* or adolescen* or youth or young).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	1,224,590
2	exp Dyslexia/	6,969
3	(dyslexi* or "poor reader*" or "reading abilit*" or "reading skill*" or "reading achievement" or "reading difficult*" or "reading disorder*" or "reading impair*" or "reading delay" or "reading defici*" or "reading disabilit*" or "literacy difficult*" or "learning disorder" or "struggl* adj3 read*").mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	38,823
4	exp Internalizing Symptoms/ or exp Externalizing Symptoms/	1,227
5	(internali?ing or "somatic complaint*" or anxious or anxiety or depression or depressed or "emotion* difficult*" or "emotion* problem*" or psycho?social or socio?emotion* or withdrawn or "mental health" or hyperactiv* or impulsiv* or externali?ing or "conduct problem*" or "behaviour* problem*" or "behavior* problem*" or aggress*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	934,610
6	2 or 3	38,823
7	4 or 5	934,610
8	1 and 6 and 7	2,296
9	limit 8 to (peer reviewed journal and english language)	1,523

(Child* or teen* or adolescen* or youth or young).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]

exp Dyslexia/

(dyslexi* or "poor reader*" or "reading abilit*" or "reading skill*" or "reading achievement" or "reading difficult*" or "reading disorder*" or "reading impair*" or "reading delay" or "reading defici*" or "reading disabilit*" or "literacy difficult*" or "learning disorder" or "struggl* adj3 read*").mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]

exp Internalizing Symptoms/ or exp Externalizing Symptoms/

(internali?ing or "somatic complaint*" or anxious or anxiety or depression or depressed or "emotion* difficult*" or "emotion* problem*" or psycho?social or socio?emotion* or withdrawn or "mental health" or hyperactiv* or impulsiv* or externali?ing or "conduct problem*" or "behaviour* problem*" or "behavior* problem*" or aggress*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]

2 or 3

4 or 5

1 and 6 and 7

limit 8 to (peer reviewed journal and english language)

Appendix D

Chapter 2 Source selection tool

	YES	NO
Publication type	• Empirical studies – case study, qualitative, quantitative, intervention studies. • Reviews (meta-analysis, systematic, scoping) • Peer reviewed – don't worry about this one at title/abstract screening • Dissertation and thesis • English language	• Editorials • Opinion pieces • Policy/position papers • Book or article reviews • Learning modules • Study protocols • Introductions to special editions
Population	• Children (0-18) • Primary or secondary students • Parents/teachers/others reporting on childhood reading difficulties/mental health • Adults retrospectively reporting about childhood reading difficulties	• Adults • Non-human (e.g., rat studies) • College/Uni samples • second language
Concept one: reading difficulties	• Children with dyslexia • Children with Specific Learning Disorder (sub-type not specified) • Learning difficulties/literacy difficulties • Word reading or reading fluency difficulties • Poor readers, struggling readers, children with reading difficulties, reading disorder • Neurodevelopmental disorders – is there a learning/reading difficulties group mentioned in the title/abstract? Then YES. • Poor comprehending in addition to poor word reading difficulties • Co-occuring ADHD, language difficulties, or additional learning difficulties are to be expected.	• Studies were a reading difficulties group or an SLD are not mentioned in the title/abstract • Children who are only poor comprehenders • Poor reading due to: • Reading difficulties associated with: lack of educational opportunity (e.g. Head start schools), bio-medical factors (e.g., brain injury, Fragile X, epilepsy), sensory issues (e.g., hearing loss); autism

	YES	NO
Concept 2– internalising/ externalising mental health concerns	• Internalising behaviour (emotional difficulties; anxiety, depression, somatic complaints) • Externalising behaviour (behaviour difficulties; (hyperactivity, impulsivity, conduct problems (e.g., aggression, rule-breaking) • Externalising disorders (ADHD, CD, ODD). • Internalising disorders (e.g., depression, anxiety disorder sub-types, reading/test anxiety) • Psycho-social or socio-emotional difficulties assessed by global measures • For qualitative studies parent, child, teacher report of mental health/emotional difficulties is sufficient for inclusion.	**No – in the absence of internalising externalising** • School refusal • Attentional difficulties • Incarceration • NSSI • Suicidal behaviour • Substance abuse • Eating disorders • Peer problems (e.g., bullying victimisation). • Psychosis • Self-esteem, self-concept, self-perception • Stress
Concept 3: Third factor	• Qual studies – another factor other than internalising/externalisingexpl ored e.g., self-esteem, coping strategies. • Individual level (e.g., self-esteem, emotion regulation, theory of mind skills, executive function skills); family level (e.g., parental attachment, parental mental health); community level (e.g., peer relationships, classroom modifications). • Motor coordination • BMI/weight/exercise	• No third factor • Un-modifiable (once child at primary school) third factors – e.g., gender, age, antenatal conditions (e.g., maternal smoking), toxins • Gene studies • brain /FMRI studies • Institutional care/adoption • Fatty acids, medications • Attentional difficulties
Context	• Any country • Kids in mainstream or special schooling • Alphabetic languages	• Non-alphabetic languages

Appendix E

Chapter 2 Data Extraction Table

Author (Date)	Title	Aim of study	Population	Learning/Reading Difficulties	Context	Mental Health Concept	Third factor of interest	Methodology	Key findings
Abarrate (1993) Dissertation[1]	Behavior problems and social competence in attention deficit hyperactivity disorder children with and without a learning disorder	To investigate how children with ADHD with and without learning difficulties differ in relation to behaviour problems and social competence	Children aged 7-12 years (n = 26 with ADHD and n = 26 ADHD with co-morbid learning difficulties)	Learning disorder based on IQ-performance discrepancy criteria using standardised measures and/or placement in Special Education class	Lower Coachella Valley, USA	Internalising/externalising symptoms measured by teacher report with the relevant sub-scale of the Child Behaviour CheckList (CBCL; Achenbach & Edelbrock, 1984)	**Community-level:** children's social problems (referred to as social competence) measured by teacher-report with the social problems sub-scale of the CBCL	Cross-sectional. Data was analysed with ANOVA / MANOVA. The analysis appears to have been confined to the social problems and externalising symptoms (not internalising) sub-scales of the CBCL	Results suggest that coexisting learning difficulty is the differentiating factor in determining whether a child with ADHD has poorer social competence and more externalising symptoms
Aitken et al., 2020[2]	Profiles of co-occurring difficulties identified through school-based screening	To investigate patterns of co-occurrence among five common childhood difficulties: inattention/hyperactivity, internalising symptoms, externalising symptoms, peer problems and reading difficulties	501 children (age range 6-9 years; 254 girls) were recruited from seven schools. 97% of the sample spoke English as their first language. Eligibility for participation was based on being in a mainstream class, and not having any sensory or physical impairments	A reading difficulties group was determined based on scores in the bottom quartile of the Dynamic Indicators of Basic Early Literacy Skills Oral Reading Fluency Task (Good & Kaminski, 2002)	Participants were recruited from one suburban and one rural school board in Ontario Canada. 25% of the children were in a French immersion class in which most of the instruction is in French.	Internalising/externalising symptoms were reported on by parents with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)	**Community level:** Peer problems measured by parent and teacher report with the peer problems sub-scale of the SDQ	Longitudinal. The data was collected at two time-points 1 year apart and analysed using latent class analysis	In the present study no co-occuring difficulties with reading, peer problems or internalising/externalizing symptoms were present

The data extract table can be found at https://www.mdpi.com/article/10.3390/ijerph20021653/s1 where the supplementary materials are located for the article. Wilmot, A., Hasking, P., Leitão, S., Hill, E., & Boyes, M. (2023). Understanding mental health in developmental dyslexia: A scoping review. *International Journal of Environmental Research and Public Health*, 20(2), 1653. https://doi.org/10.3390/ijerph20021653

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Alexander-Passe (2006)[3]	How dyslexic teenagers cope: An investigation of self-esteem, coping, and depression	To investigate how adolescents with dyslexia cope with their difficulties and how this relates to their self-esteem and depression	19 adolescents (12 male M-academic year = 11.17; 7 female, M-academic year = 11.86)	Recruitment occurred through dyslexia associations and an educational psychologist. No further description of criteria for dyslexia were provided	London, United Kingdom	Depression was measured by self-report with the Beck-Depression Inventory (BDI-II; Beck et al., 1996)	**Individual-level**: Adolescents reported on their self-esteem with the Culture-free Self-Esteem Inventory (CFSEI; Battle, 1992) and their coping strategies with the Coping Scale for Stressful Situations (adolescent versions) (Endler & Parker, 1999)	Cross-sectional. Results on variables of interest were compared to the findings of other studies	Results suggest that girls with dyslexia may be particularly susceptible to depression and low self-esteem and employ more emotional and avoidant coping strategies than boys
Al-Yagon (2009)[4]	Comorbid LD and ADHD in childhood: Socioemotional and behavioural adjustment and parents' positive and negative affect	To examine a variety of risk and protective factors for socio-emotional difficulties among children with co-morbid ADHD/LD relative to those considered to have typical development	The sample consisted of 118 father-mother-child (8-12 years) triads; 59 families with children with co-morbid ADHD/LD (42 boys, 17 girls) and 59 with a child with typical development (40 boys, 19 girls)	All children in the co-morbid ADHD/LD group had been formally diagnosed prior to participating in the study. Diagnostic criteria were reported as being consistent with DSM-4 criteria. Sub-type of learning difficulty was not described	Children were attending public schools in the urban areas of central and southern Israel	Internalising/externalising symptoms measured by father and mother report on the Child Behaviour CheckList (CBCL; Achenbach, 1991).	**Individual-level**: Children reported on their coping and resilience with the Children's Sense of Coherence Scale (Margalit & Efranti, 1995; the Effort Scale (ES; Lackaye & Margalit, 2006); the Children's Hope Scale (CHS; Lackaye & Margalit, 2006). **Family-level**: Children reported on child-parent relationships with the Attachment Security Scale (ASS; Kers et al., 1996) and parents reported on their own confidence and mental health with the Affect Scale (AS; Moos et al., 1987**). Community level:**	Cross-sectional. A group comparison (children/parents with/without disability) analysis was followed by an investigation of the contribution of the various risk and protective factors to children's socio-emotional wellbeing	Relative to children with typical development, children with ADHD/LD self-reported more loneliness, lower sense of coherence (resilience) and less hope. Parents of these children, relative to those with typical development, also reported more socio-emotional and behavioural difficulties (internalising and externalising) among their children. Father's negative affect and depression, and mother's negative affect were associated with higher levels of child internalising/externalising symptoms. Children's attachment to parents did not appear to be associated with their internalising/externalising symptoms in this sample

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							Children completed the Loneliness and Social Dissatisfaction Scale (LSDS; Asher et al., 1990)		
Al-Yagon (2014)[5]	Child-mother and child-father attachment security: links to internalizing adjustment among children with learning disabilities	To investigate the role of children's attachment to their father and mother in explaining internalising symptoms among children with learning disabilities relative to those with typical development	The sample consisted of 107 children with learning difficulties (52 girls and 54 boys) and 98 children (56 girls and 42 boys) with typical development aged 8-12 years and their parents	All children in the LD group had been formally diagnosed prior to participating in the study. Diagnostic criteria were reported as being consistent with DSM-4 criteria. Sub-type of learning difficulty was not described	Children were recruited from 7 elementary schools in urban areas of central Israel	Fathers and mothers reported on their child's internalising symptomology with the internalising sub-scale of the Child Behaviour CheckList (CBCL; Israeli translation)	**Individual-level**: Children reported on their coping strategies (sense of coherence, hope, and effort (e.g., item "I don't give up even when it is difficult for me") with the Children's Sense of Coherence Scale (Margalit & Efranti, 1995) and Children's Hope and Effort Scale (Snyder et al., 1997; Lackaye & Margalit, 2006)**. Family-level**: Children also reported on child-parent relationships with the Attachment Security Style (Kerns, Klepac & Cole, 1996). **Community-level:** loneliness and social (dis)satisfaction measured with the Loneliness and Social Dissatisfaction Scale (Asher et al., 1990)	Cross-sectional. Group differences on all variables were analysed followed by Structural Equation Modelling to analyse the influence of mother and father attachment on all the child variables (loneliness, internalising, coping)	Children with learning difficulties had more parent reported internalising symptoms, more self-reported loneliness, and poorer coping (effort, hope, and sense of coherence) than typically developing peers. The child and parent-reported internalising symptoms did not correlate in either group. However, findings suggest that children with learning difficulties may be more vulnerable to insecure attachment with their parents and indicate the possible protective function of secure relationships with mothers and fathers
Al-Yagon (2016)[6]	Perceived close relationships with parents, teachers, and	To compare adolescent's attachment relationships with	280 adolescents (15-17 years, 154 girls), 90 with a learning	Sub-samples of children with learning difficulties were all	Children came from regular public high schools in urban	Children self-reported on their mental health with the Hebrew adaptation of the Affect Scale (Moos et al., 1987) and the youth	**Family and Community-level:** Intergroup differences in 3 forms of	Cross-sectional. Data was analysed via multigroup structural	High quality of perceived friendship with a best friend seemed particularly important for the mental health (both

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	peers: Predictors of social, emotional, and behavioural features in adolescents with LD or comorbid LD and ADHD	parents, teachers, and friends and how these are related to children's mental health	difficulties diagnosis, 91 with combined ADHD and learning difficulties, and 99 classified as typically developing	formally diagnosed with an SLD in accordance with DSM-4 criteria. Subtype of learning difficulty was not described	areas of Israel. First language wasn't mentioned but measures used were all Hebrew language	version of the Child Behaviour CheckList (CBCL; Achenbach, 1991)	attachment relationship (parents, teachers, peers) were investigated: Child-parent relationship (using the Attachment Security Style; Kerns et al., 1996), child-teacher relationship (using the Children's Appraisal of Teacher as a secure Base Scale (Al-Yagon & Mikulincer, 2006) and friendship (using the Friendship Quality Questionnaire; Parker & Asher, 1993)	equation modelling	internalising and externalising) of children with learning difficulties (with and without ADHD). Having a caring teacher was associated with higher levels of positive affect among children with learning difficulties. Children with learning difficulties, compared to controls, appeared more vulnerable to the effects of insecure attachment to their mothers in terms of their mental health than the other groups
Antshel & Guy-Ronald (2006)[7]	Maternal stress in nonverbal learning disorder: A comparison with reading disorder	To investigate mothers' stress and coping in association with children's mental health among children with two subtypes of learning difficulty: reading disorder and nonverbal learning disorder	75 mother-child dyads (8-11 years, 51 boys) including 31 children with a diagnosed reading disorder, 21 with non-verbal learning disorder and a "typically developing" control group matched by age, gender and IQ	Inclusion criteria to the reading disorder sub-group were that the children met DSM-4 criteria for a reading disorder	USA. The majority of participants were European American and all spoke English as a first language	Children's social, emotional, and behavioural wellbeing was measured by parent and teacher report using the relevant versions of the Behaviour Assessment for Children (BASC; Reynolds & Kamphaus, 1992).	**Family-level**: Mother's self-reported parenting stress, mental health, and perceived levels of social support measured respectively by the Parenting-Stress Index-Short Form (PSI-SF; Abidin, 1990) the Symptom-Checklist 90-Revised (SCL-90-R; Derogatis, 1983) and Social Support Questionnaire (SSQ; Sarason et al., 1983)	Cross-sectional. Regression analysis was used to investigate the contribution of the maternal variables to children's internalising and externalising symptoms by group (reading difficulties vs non-verbal learning disorder vs typical development)	Mothers of children with reading disorder reported higher levels of general distress than the other 2 groups and were more likely to report their child's behaviour as "difficult" relative to those who had children with no learning disabilities. Among those with reading difficulties, children's internalising symptoms were not related to their mother's level of stress but were associated with mother's mental health concerns and their perceived levels of social support
Baumeister et al., (2008)[8]	Peer victimization in children	To investigate psychosocial correlates of	77 children and adolescents with learning	All participants had a learning difficulties	USA	Internalising/externalising symptoms measured by parents with the Child Behaviour	**Community-level**: Peer victimisation was measured by	Cross-sectional. Pearson correlations were used	Peer victimisation was positively correlated with parent reports of children's internalising

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	with learning disabilities	peer victimisation among children with learning disabilities	difficulties (5-18 years, Mage = 11.3 years, 68 males) referred for either learning difficulties diagnosis or psychiatric assessment	diagnosis but criteria for diagnosis were not further described. The researchers accessed their clinical case files to conduct the research		Check-List (CBCL; Achenbach, 1991) and behaviour/attentional difficulties with Connors Parents Rating Scale-Revised (Goyette et al., 1978). Children reported on depression and anxiety with the Children's Depression Inventory (CDI; Kovacs, 1992) and the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978)	parent report with McCloskey and Stuewig's (2001) peer victimisation scale	to analyse associations between variables of interest	and externalising symptoms and children's self-reports of depression symptoms
Benassi et al., 2020 [9]	Impaired school well-being in children with Specific Learning Disorder and its relationship to psychopathological symptoms	To investigate the association between school well-being and children's mental health from the point of view of children and mothers	72 children (8-10 years, 52 without learning difficulties and 20 with learning difficulties) and their mothers. The SLD group comprised 16 males and 4 females and the control group comprised 27 males and 25 females	The learning difficulties diagnosis complied with ICD-10 guidelines. The number of children with reading difficulties was not reported	The children were recruited from 3 traditional schools within the Moderna district of Italy	Parents reported on children's internalising/externalising symptoms with the Child Behaviour CheckList (CBCL; Achenbach, 1991; Achenbach & Rescorla, 2001).	**Community-level:** school wellbeing was assessed by child and parent report with the Questionnaire on School Well-being (QBS; Tobia & Marzochi, 2015)	Cross sectional. General linear models were applied	There were closer associations between poor school wellbeing (struggles with learning and emotional problems at school) and higher levels of parent-reported internalising/externalising symptoms among children with learning difficulties, relative to those without any known learning difficulty, suggesting that school wellbeing may be a particularly salient factor in the mental health of children with learning difficulties
Blicher et al. (2017) [10]	The role of trait anxiety and preoccupation with reading disabilities of children and their mothers in predicting children's reading comprehension	To investigate how reading comprehension in children with reading disability is predicted by trait anxiety, and preoccupation with reading disability (both child and mothers)	The sample consisted of 88 children (grade 3-5, 55.7% boys) with word-reading difficulties and their mothers	Children identified by school as having difficulties with basic reading and reading comprehension. The researchers then validated this by assessing children	The children were all in regular elementary school classes in Israel and were recruited from 12 schools	Children's trait anxiety was measured by self-report with the Hebrew version of the State-Trait Anxiety Inventory (STAI; Speilberger et al., 1975)	**Individual-level:** Children's pre-occupation (self-consciousness) with their reading difficulties was measured with the Preoccupation with Reading Disability Questionnaire (PRDQ; Shaney et al., 2011). **Family-level:**	Cross-sectional. Pearson correlations followed by an analysis of direct and indirect effects using the PROCESS macro (Hayes, 2013)	Children's reading comprehension could be explained by their word reading ability, anxiety and their mother's preoccupation with their child's reading difficulties, but not maternal anxiety. Of interest to this review, children's trait anxiety was positively associated to their own and their mothers' preoccupation with their reading difficulties

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				on word-reading fluency			Mother's anxiety was measured with the STAI and their pre-occupation with their child's reading difficulties with a parent version of the PRDQ		
Boetsch et al., 1996 [11]	Psychosocial correlates of dyslexia across the life span	Studies 2, 3 and 4 are of interest to this review as they focused on children and adolescents. The aim was to examine the psychosocial functioning of children and adolescents with dyslexia	The researchers chose three different samples of children (aged 10-12 years): a clinic-referred sample, a community sample, and a twin sample. All studies incorporated a "typically developing" control group	A formal dyslexia diagnosis with a discrepancy between reading/spelling performance and what would be expected based on their age, IQ, and educational experience	USA	Children reported on their depression symptoms with the Dimensions of Depression Profile for Children and Adolescents (Harter & Nowakowski, 1987); and the Children's Depression Inventory (CDI; Kovacs, 1981). ADHD symptomology was measured in all three studies by the ADHD subscale of the Diagnostic Interview for Children and Adolescents (DICA; Herjanic, 1982).	**Individual-level**: Children reported on their self-worth with the Self-Perception Profile for Learning Disabled Students (Rennick & Harter, 1988). **Family/Community-level:** Children's perception of social support from friends, parents, teachers, and classmates (study 2 only) was measured with the Social Support Scale for Children (Harter, 1985).	Cross-sectional. For studies 2 and 4 two-way MANOVAs were conducted (dyslexic and non-dyslexic groups) and age (chid and adolescent). For study 3 between-groups analyses consisted of paired sampleT-tests to compare each pair of twins	Across all samples, children and adolescents with dyslexia, relative to controls, reported lower global self-worth, lower academic self-competency, more depression symptomology and more (parent and child reported) ADHD symptoms. In clinic referred samples at least, children and adolescents with dyslexia reported being significantly less supported by parents, teachers, and peers than their typically achieving peers. Parents appeared to be more aware of externalising than internalising symptoms. There were no significant differences related to age or gender in the mental health variables
Bonifacci et al. (2016)[12]	Specific Learning Disorders: A look inside children's and parents' psychological well-being and relationships	To investigate the relationship between parent and child psychological profiles among a sample of children with learning difficulties	34 triads (child, father, and mother) participated. A learning difficulties sub-sample of 17 children (Mage = 10.5 years +/- 1.6 yrs, 13 males) and a control group of 17 without	All children in the learning difficulties sub-sample had received a formal diagnosis of SLD-mixed type (i.e., at last two difficulty domains across reading, writing, and	Italy. Families of children with learning difficulties were recruited through a specialist assessment and intervention clinic	Both children and parents reported on children's internalising symptoms using the Test of Anxiety and Depression (TAD; Newcomer et al., 1995)	**Individual-level:** Children's self-esteem was measured by the Self-esteem Multidimensional Test (TMA; Bracken, 2003). **Family-level:** Parental stress was measured by the Parenting Stress Index (PSI; Abidin, 1995), parental	Cross-sectional. MANOVA's with group (SLD and control) and parent (mother and father) as between-subject factors	Parents of children with learning difficulties, relative to those without, reported higher levels of parenting stress but did not differ regarding mental health concerns. Children with learning difficulties reported significantly lower scholastic and inter-personal self-esteem but not higher levels of anxiety or depression, although they were rated as more anxious and

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			learning difficulties (Mage = 10.7 years, 9 males) and their parents participated	mathematics). The number with reading difficulties was not described			mental health measured by the Symptom-Checklist 90-Revised (SCL-90-R; Derogatis, 1983) and parenting practices (e.g., discipline styles) measured by the Parenting Scale (PS; Arnold et al., 1993)		depressed by their parents. Across the groups, there were associations between higher levels of children's depression and greater maternal stress, psychological difficulties, and ineffective disciplinary styles
Bonifacci et al., (2020)[13]	Rumination and emotional profile in children with Specific Learning Disorders (SLD) and their parents	To study whether children with SLD and their parents ruminate more than typically developing peers and whether rumination is associated with child and parent mental health concerns	50 children and their parents (50 mothers and 50 fathers) were recruited, half with confirmed SLD (Mage = 10.08 years +/- 1.15 yrs) and a control group without SLD (Mage = 9.88 years +/- 0.53 yrs) matched by age and gender	Diagnosis was by full neuro-psychological assessment and conformed to ICD-10 criteria. 24% of the SLD group had a diagnosis of dyslexia, 4% dysorthorgraphia (spelling), 16% dyscalculia and 56% had mixed learning disorders	Italy	Children reported on their anxiety with the Multidimensional Anxiety Scale for Children (MASC; March et al., 1997). Parents reported on their children's psycho-social functioning with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)	**Individual-level**: Children reported on their coping strategies with the Response Style Questionnaire (CRSQ; Abela et al., 2004) and 3 emotional competencies: emotional control, emotional self-awareness, and situational responsiveness with the Emotion Regulation Index for Children and Adolescents (ERICA; MacDermott et al., 2010) and rumination with the Kid's Rumination Interview (KRI; Baiocco, R. et al., 2017) and their prosocial behaviour was assessed by parents with the relevant sub-scale of the SDQ. **Family-level**: parents reported on	Cross-sectional. MANOVAs were used to investigate group differences (SLD vs control) on the parent-reported child variables. Independent group Ttests (SLD vs control) were used to analyse the parent data. Pearson correlation analysed parent variables in association with child rumination but not child mental health	After Bonferroni corrections were applied there were no significant group differences in internalising/externalising symptoms, prosocial behaviour, peer problems, coping strategies, emotional competencies or generalised ruminative tendencies. However, children with SLD reported more rumination on a vignette related to teasing by peers and their mothers reported higher depression and parent's reported higher ruminative tendencies

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							their emotion regulation with the Italian adaptation of the Rumination Response Scale (RRS; Nolen-Hoeksema & Morrow, 1989) and their mental health with a battery of standardised measures including the Penn State Worry Questionnaire (PSWQ; Meyer et al., 1995) **Community-level:** children's peer problems were measured by parent report with the relevant sub-scale of the SDQ		
Boyes et al., (2020)[14]	Correlates of externalising and internalising problems in children with dyslexia: An analysis of data from clinical casefiles	To examine a range of hypothesised factors associated with internalising and externalising symptoms among children with dyslexia	The case files of 450 children and adolescents with dyslexia (age range 6-17 years, 58% male) were analysed	All formally diagnosed with dyslexia according to DSM-5 (APA, 2013) criteria	Australia. The case files were provided by the Dyslexia SPELD Foundation (DSF) a leading Western Australian provider of services to children and families with learning difficulties	Was assessed twofold. Firstly, by parent report on a single open-ended question during diagnostic interview. This was then dichotomised (0= no behaviour difficulties and 1 = behaviour difficulties) for analysis. Secondly, further open-ended sections of the parent questionnaire were searched for reference to other emotional difficulties such as mood problems	**Individual-level:** Self-esteem, emotion regulation, social skills. **Family-level:** parent-child relationship. **Community-level:** peer problems, bullying victimisation, school support, child-teacher relationship, all measured by survey items in clinical interviews with parents	Cross-sectional data was analysed using two multiple regressions: one for internalising and one for externalising difficulties. Mediation models were then tested	Among children with dyslexia, inverse associations between self-esteem, emotion regulation, and social skills and positive associations between bullying victimisation and internalising and externalising symptoms were found. Additionally, peer relationship difficulties were indirectly associated with greater internalising /externalising symptoms via low self-esteem and emotion regulation difficulties. School and family factors were not significant in the multivariate analysis but teacher/parent-child relationship difficulties did correlate

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									with mental health concerns in the bi-variate analysis
Camilleri et al. (2019)[15]	"They labelled me ignorant": Narratives of Maltese youth with dyslexia on national examinations	To explore the experiences of students with dyslexia within the context of sitting national examinations	Research participants were 8 Maltese adolescents (aged approx. 15-16 years)	All had been formally assessed as having dyslexia	Malta	Stress, anxiety, in particular "test anxiety" was explored	**Community-level**: Misunderstandings and lack of knowledge about dyslexia leading to inappropriate learning/assessment accommodation	Qualitative design. Participants were interviewed and transcripts were analysed thematically using a discourse analysis approach	The researcher identified that a perception of a lack of understanding about the needs of people with dyslexia contributed to stress and anxiety in this high-stakes assessment situation
Capozzi et al. (2008)[16]	Psychiatric comorbidity in learning disorder: Analysis of family variables	To evaluate the role of parenting style on the mental health of children with Learning Disability (LD)	The sample consisted of 56 children (7-12 years, 44 boys and 12 girls) and their parents	Children were all diagnosed with a learning disability. The number with dyslexia was not described	Italy. Children were recruited via a health clinic where they had all been assessed for school-related problems	Parents reported on children's internalising/externalising symptoms with the Child Behaviour CheckList (CBCL; Achenbach, 1991)	**Family-level**: Parent's reported on the child-parent relationships with the Attachment Style Questionnaire (ASQ; Feeney et al., 1994) and parenting practices with the Family Attitudes Questionnaire - Italian Version (FAQ; Duszynski, 1974; Pecci et al., 2003)	Cross-sectional design. Stepwise regressions were used to analyse the data with internalising and externalising symptoms as outcome variables and the various family factors as predictor variables	"Pathological" levels of internalising, relative to externalizing, symptoms were reported by parents. Children's attachment insecurity with parents (differentially for father and mothers) was associated with higher levels of internalising/externalising symptoms
Carroll et al. (2005)[17]	Literacy difficulties and psychiatric disorders: Evidence for comorbidity	To investigate the nature and specificity of links between specific literacy difficulties and psychiatric disorder	A representative sample of 5752, 5–15-year-old British (England, Scotland and Wales) children and adolescents (68 girls and 221 boys classified with learning difficulty)	The 5% of children (9 years and older) whose reading, or spelling scores were furthest below their predicted scores based on their vocabulary scores	United Kingdom. The researchers gathered their data from the 1999 national survey of child mental health carried out by the UK office for National Statistics in 1999	Parents and teachers reported on internalising/externalising symptoms with the Strengths and Difficulties Questionnaire (SDQ; Gooman, 1997) and the childhood psychiatric disorders with the Development and Well-being Assessment DAWBA; Goodman et al., 2000). In addition, children aged 11 years and older completed the Short Mood and Feelings Questionnaire (SMFQ; Angold et al., 1995) which contains items reflecting the symptoms of depression	**Family-level**: Of interest to this review parents reported on family functioning with the McMaster Family Activity Device (Miller et al., 1985) and mothers reported on their level of maternal distress using the General Health Questionnaire (GHQ-12; Godlberg & Williams, 1988)	Cross-sectional design. Data was analysed with ANOVA and regression models	Attentional difficulties appeared to mediate links between literacy difficulties and higher levels of externalising symptoms as well as children's own reports of "low mood", but anxiety could not be explained by co-occurring attentional difficulties. Of note to this review, in this study literacy difficulties were not associated with higher levels of maternal distress or poorer family functioning

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Casey et al., 1992[18]	Impaired emotional health in children with mild reading disability	To investigate the impact of reading difficulties on children's self-esteem and emotional health	28 children (aged 8-12 years) met criteria for the reading disorder group. A control group of 39 without any known learning difficulty were recruited through routine health screening	All children with reading difficulties met DSM-3 criteria for developmental reading disorder	USA. The students with reading difficulties were all attending a tailored school summer camp, and were described as experiencing "mild" reading difficulties and coming from supportive home environments of high SES status	Parents reported on their children's mental health with the Rand Mental Health Index (Eisen et al., 1980) which has three sub-scales: anxiety, depression, and positive wellbeing. Parents also reported on children's internalising/externalising symptoms with the Child Behaviour CheckList (CBCL; Achenbach, 1978/79 versions)	**Individual-level:** Both parents and children reported on children's self-perceptions using the relevant versions of Harter's Self-Perception Profile (Harter, 1982)	Cross sectional. Group comparison study	Children with dyslexia, relative to peers without learning difficulties, reported lower levels of scholastic self-competence but not other domains of self-competence. No significant group differences in internalising/externalising behaviour on the CBCL were found, however, higher levels of anxiety and lower levels of well-being were reported by parents of children with dyslexia, relative to those without learning difficulties, on the Rand Mental Health Survey. The researchers concluded that children with reading difficulties were at risk of poor self-esteem and poor emotional health despite having supportive home environments
Cen & Aytac (2017)[19]	Ecocultural perspective in learning disability: Family support resources, values, child problem behaviors	To investigate associations between mother's perceived social support resources, values, and children's "problem behaviors" (internalising/externalising symptoms)	Ninety children and adolescents with learning difficulties (7-14 years, 42 girls and 48 boys), their mothers and teachers	All diagnosed with learning difficulty through previous psych-educational assessments. No break-down of numbers with reading difficulty reported	Turkey	Internalising/externalising symptoms measured by teacher-report with the Child Behaviour Problem Scale (Kanner, 2007)	**Family-level**: Mother reported on their level of family social support with the Family Support Scale (Kanner, 2003) and their parenting values with the Portrait Values Questionnaire (PVQ; Schwartz et al., 2001)	Cross sectional. Pearson correlation, regression analysis, and Haye's moderation analysis were conducted	After controlling for severity level of learning difficulty (teacher reported) there was some evidence of parental values (openness to change and "conservation" (secure home environment) and aspects of mothers' perceived social support (informational support) being associated with less internalising symptoms among children and mother's perceived emotional support being associated with less externalising symptoms among children
Chiapeddi & Baschenis (2016) [20]	Specific learning disorders and anxiety: A matter of	To investigate associations between anxiety among children	20 children and adolescents (aged 8-13) with SLD and 32	SLD diagnosed according to ICD-10 criteria. No description	Italy. The SLD group were recruited via a health centre.	Children reported on their anxiety with the Anxiety sub-scale of the Self-administered Psychiatric Scales (SAFA-A; Cianceitti et	**Community-level**: Perceived support from teachers was measured by a	Cross-sectional data was analysed by Mann Whitney U test	As predicted children with SLD reported significantly higher anxiety than the control group. Further, children with SLD who

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	school experience?	with learning difficulties and their school experience (namely perceived level of support from their teachers)	same-aged typically developing peers	of how many children had dyslexia	The control group were recruited from one local school	al., 2001) which measures: generalised anxiety, worry about the future, social anxiety, separation anxiety, and school-related anxiety	single survey item. Children with SLD were asked: "Do you think that your teachers were able to understand your disorder and help you?"	and Spearman's Rho	perceived their teacher as understanding and caring had lower levels on all domains of anxiety
Claessen et al., (2020)[21]	Educators' perceptions of the impact of reading difficulties for young people	To further understanding about risk and protective factors for the wellbeing of children with reading difficulties	20 educators who all had a minimum of 2 years classroom experience and currently working with children aged 5-18 with reading difficulties	The children described had to have been identified as having persistent reading difficulties	Perth, Western Australia	Mental health was constructed as comprising of both internalising and externalising symptoms and explored thematically	**Individual-level**: responses to diagnosis, in particular feelings of shame. **Community-level**: social stigma (i.e., feeling "different")	Qualitative. A phenomological approach was taken and Braun and Clarke's (2006) approach to thematic analysis used to analyse the data	Stigma related to feelings of shame and difference were identified as possible risk factors to children's mental health
Dahle et al. (2011)[22]	Coexisting problem behaviour in severe dyslexia	To better understand internalising and externalising symptoms in dyslexia in different settings (e.g., home/school)	A group of 70 children and adolescents (59 boys, 11 girls, Mage = 150.49 months) with severe dyslexia and a control of 70 children (pair-wise matched on age, gender, cognitive level, and rural/urban context) without reading difficulties (Mage = 101.31 months)	Diagnosis of dyslexia based on phonological difficulties. Nine children in the reading difficulties group also had an ADHD diagnosis and 1 had a diagnosis of Tourette's syndrome	Norway.	Parent, teacher, and child reports using the Child Behaviour CheckList (Achenbach & Rescorla, 2001)	**Community-level**: Of interest to this review, children's social problems were also assessed from multiple perspectives with the CBCL	Cross-sectional. Group comparison design.	Dyslexia was strongly associated with higher levels of internalising symptoms in this sample, more than externalising symptoms. Parents reported higher levels of internalizing symptoms than teachers. Teachers, but not the children themselves, appeared to identify social problems among the students with dyslexia and all were boys. The study highlighted the importance of considering the context (school/home) when considering children's socio-emotional difficulties
Dahle & Knivsberg, (2014)[23]	Internalizing externalizing, and attention	To investigate dyslexia-related group differences in	Twenty-six 9–10-year-old children with dyslexia (Mage = 9	Dyslexia was determined based on poor performance	Students all came from mainstream	Internalising/externalising behaviour reported by teachers and parents with the Child	**Community-level**: Social problems also assessed using teacher and parent	Cross-sectional	Parents and teachers reported a higher level of internalising and externalising difficulties in the dyslexia group relative to

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	problems in dyslexia	behavioural/emotional problems	years and 8 months) and 26 without (Mage = 9 years and 10 months)	(lowest 20% of students) on standardised tests of word reading and spelling	schools in rural Norway	Behaviour CheckList (CBCL; Achenbach & Rescorla, 2001)	reports on the social problems sub-scale of the CBCL		controls but only the teacher ratings reached significance. Teachers rated the children with dyslexia as having more social problems and aggressive behaviors than children without any known learning difficulty
D'Amico & Guastaferro, (2017) [24]	Emotional and meta-emotional intelligence as predictors of adjustment problems in students with Specific Learning Disorders	To investigate the effect of severity level of SLD and emotional intelligence on the psycho-social wellbeing of adolescents with a diagnosed SLD	34 Italian adolescents (14-19 years, 25 male, Mage=16 years) with an SLD and their parents participated	All adolescents met DSM-4 criteria (APA, 1994) for an SLD. Of these, 20 of the total sample self-reported difficulties in reading	Italy. Participants were contacted through their schools and assessed using the Italian language versions of all measures	Internalising, externalising and total "problem behaviour" was measured by children with the Italian version of the Youth Self-Report (aged 11-18 years) and parent version of the Child Behaviour CheckList (CBCL; Achenbach, 1991)	**Individual-level:** Emotional intelligence was measured by the Intelligenza Emotiva: Ability, Credenze e Concetto do Se Mata-Emotiva (IE-ACCME, D'Amioca, 2013) a self-report scale with 3 sub-scales purporting to measure: beliefs about emotions; self-concept about emotional abilities (e.g., "I am able to identify the emotions that derive from particular physical sensations"); and emotional abilities (through responses to emotion problem vignettes) (p. 21).	Cross-sectional. Correlational analysis followed by multiple linear regressions were used to analyse the data	The results suggest that emotional beliefs, emotional self-concepts, and emotional intelligence are positively associated with the mental health (especially fewer internalising symptoms) of children with learning difficulties
DeBrew (2017)[25]	Who will help my son? A family's journey with dyslexia	A case study approach was used to explore the role of mental health nurses in the care of children with	Case study of a parent perspective. A personal account from one mother who is also a mental health nurse	The child presented with early reading difficulties and was later diagnosed with dyslexia	USA	School anxiety was explored	**Individual-level**: self-worth and **Family/community-level**: parental/teacher support. **Community-level**: Stigma and teacher (mis)understanding	Qualitative design: a single case study	A call to action for mental health nurses to be aware of the socio-emotional needs of children with dyslexia and their families. Greater school anxiety was related to teacher misunderstanding and lower self-esteem (i.e., "feeling stupid");

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	dyslexia and their families								family support is highlighted as protective
de Lima et al. (2020)[26]	Behavior problems and depressive symptoms in developmental dyslexia: Risk assessment in Brazilian students	To compare students with and without dyslexia on behavior problems and depressive symptoms	Sixty-one children and adolescents (aged 7-14 years) including 31 with a dyslexia diagnosis and 30 without learning difficulties	The dyslexia group met DSM-5 diagnostic criteria	Brazil	Internalising/externalising symptoms measured by parent report with the Child Behaviour CheckList (CBCL; Achenbach & Rescorla, 2004) and child depression measured by self-report with the Children's Depression Inventory (CDI; Kovacs, 1981)	**Community-level:** parents also reported on children's social problems with the CBCL	Cross-sectional	Students with dyslexia, relative to those without learning difficulties, had more self-reported depressive symptoms and higher levels of parent-reported social problems and internalising and externalising symptoms
Eissa (2010)[27]	Behavioral and emotional problems associated with dyslexia in adolescence	To examine the emotional and behavioural difficulties associated with dyslexia	The sample consisted of fifty-six adolescents, 12-18 olds, 35 with reading difficulties and 21 typical readers matched by age	All adolescents in the reading difficulties group had a reading disability (dyslexia) in accordance with ICD-10 and DSM-4 criteria. The researchers noted that they all were without pre-existing psychopathology or a history of premature birth, head injury or seizure	Country of origin unknown. Participants in the reading difficulties group had typically been referred for assessment by their parent/teacher due to behavioural and/or learning concerns	Adolescents reported on their mental health with three standardised measures: The Youth Self Report of the Child Behaviour Check-List (version unstated) and the Hamilton rating scales of depression (Hamilton, 1960) and anxiety (Hamilton, 1959)	The adolescents also took part in a semi-structured interview in which they reported on; **Individual-level:** self-esteem, and **Community-level:** success/failure at school, feelings of well-being at school, the impact of dyslexia on school achievements, and peer relationships/bullying	Mixed methods design using cross-sectional qualitative and quantitative data	Adolescents with reading difficulties, relative to their typically reading peers, evidenced higher levels of both internalising (anxiety and depression) and externalising difficulties and poor overall self-esteem. Internalising and externalising symptoms correlated suggesting to the researcher that some children "act out" when anxious/depressed. The interview data suggested that poor school achievement contributed to negative self-esteem but that school was "tolerable" to most participants due to having good friends. It seemed that good friendships compensated for their academic difficulties. Some reported having been bullied due to their reading/writing difficulties
Fussell et al. (2005)[28]	Social skills and behavior problems in children with disabilities with and without siblings	To examine social skills and behaviour problems and the influence of siblings among children with a	A clinical sample of 85 children and adolescents (6-15.6 years, 58 males) and a corresponding	Of the total sample, 42 (approx. 50%) had a learning difficulties diagnosis (with or without co-	South Carolina, USA	Parents and teachers reported on children's internalising and externalising symptoms with the relevant versions of the Child Behaviour Check-List (CBCL; Achenbach, 1991)	**Individual-level:** Social skills measured by parent-report with the Social Skills Rating Scale (SSRS; Gresham & Elliot, 1990).	Cross-sectional. ANOVA was used to compare the disability groups on the key variables	Children with learning difficulties only were higher in internalising than externalising symptoms. There was no significant effect of siblings on the psycho-social measures. The influence of social skills on

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		range of disabilities	parent were recruited from a hospital-based paediatric clinic	morbid ADHD). The number with dyslexia was not reported					internalising/externalising behaviour was not assessed
Gadeyne et al. (2004)[29]	Psychosocial functioning of young children with learning problems	To investigate psycho-social functioning among children with diagnosed learning difficulties relative to those with poor academic performance but no diagnosed learning difficulty	The sample consisted of 276 children (aged 6-7 years, 139 boys and 137 girls). The researchers formed three groups for comparison: a group with low academic achievement but no known learning disability, a group with a learning disability based on IQ-achievement discrepancy and a group with learning disability based on achievement discrepancy	The researchers formed the groups of children with Learning Disability using a well-used multi-stage procedure (Reynolds, 1994). Compared children with reading/spelling difficulties and mathematics difficulties	Children were from mainstream schools in a rural area of Belgium	Internalising/externalising symptoms measured by parent and teacher report with the Child Behaviour CheckList (CBCL; Achenbach, 1991)	As the children were quite young the researchers used pictorial measures which were based on standardised measures of all variables of interest. **Individual-level:** children's self-concept and motivation for academic work and **Community-level:** Children's views on their social relationships were measured. Teachers and parents also reported on children's social problems with the relevant sub-scale of the CBCL	Cross-sectional. ANOVA and MANOVA used to analyse the data	Children with reading/spelling difficulties and children with low academic achievement differed most from controls on the range of psycho-social difficulties. However, low cognitive self-concept seemed to be most related to academic achievement rather than learning disability whereas social difficulties were related to learning difficulties and children with low academic achievement seemed prone to problems with academic motivation
Gallegos et al. (2012)[30]	Anxiety, depression, and coping skills among Mexican school children: A comparison of students with and without learning disabilities	To compare the severity and risk status for anxiety and depression and coping skills among children with and without learning difficulties	260 children (130 with learning difficulties and 130 without learning difficulties, 9-12 years)	Children with learning difficulties were identified by school records which were then evaluated by a multidisciplinary team to determine	Mexico. Participants were recruited from 8 randomly selected schools	Children reported on their mental health with the Spanish versions of the Spence Anxiety Scale (SCAS; Spence, 1997) and Children's Depression Inventory (CDI; Kovacs, 1981)	**Individual-level:** Children reported on their coping strategies with the Coping Skills Questionnaire (CA; Hernandez-Guzman, 2003) a 12-item scale to measure children's interpretation	Cross-sectional. Independent samples Ttests were performed to compare children's coping skills with their levels of anxiety and depression	Children with learning difficulties reported significantly higher levels of anxiety and depression symptoms but no statistically significant group differences were reported on coping strategies

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				group membership. The number with reading difficulties was not described			and reaction to problem situations in terms of: active coping, emotional coping, and passive/avoidant coping	symptoms by group	
Giovagnoli et al., (2020)[31]	Internalizing symptoms in developmental dyslexia: A comparison between primary and secondary school	The article reported on two studies. The second is of interest to this review. The aim of this study was to explore a range of factors associated with internalising symptoms among secondary school students with dyslexia	Study 2 included 44 adolescents (42 males) with a diagnosis of dyslexia and 54 age-matched controls (39 males) *Mage* 14.9 years	Formal diagnosis of dyslexia was required for group membership. This was then validated through reading tests administered by the researchers	Italy. All students with dyslexia came from one upper-secondary technical college	Internalising symptoms were measured by the Italian version of the Youth Self-Report (aged 11-18 years) of the Child Behaviour CheckList (YSR-CBCL; Achenbach et al., 2001)	**Individual-level**: Children reported on their coping strategies with the Italian version of the Melbourne Decision Making Questionnaire (MDMQ; Nota & Soresi, 2000) which measures 4 decision-making styles: Avoidance of problem; Procrastination in dealing with problems; Vigilance; and Hypervigilance (having "excessive alertness" toward problem situations at school (p. 461); their school and social competence with the YSR-CBCL; and their Quality of Life (QuoL) with the Clipper test (Soresi & Nota, 2003): sense of autonomy, sense of self-sufficiency, perceived self-efficacy (related to school experiences mainly).	Cross-sectional design. Several generalised linear models were used to analyse the data	Higher levels of internalising symptoms among adolescents with dyslexia were associated with peer difficulties, low levels of self-efficacy, and more hypervigilance at school. Family factors, and school wellbeing ("satisfaction with school") did not appear to be associated with internalising symptoms

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							Family/Community-level: satisfaction with school experience, satisfaction in relationships and support from peers and family		
Goldston et al. (2007)[32].	Reading problems, psychiatric disorders, and functional impairment from mid-to late adolescence	To investigate whether functional impairment and psychiatric morbidity differ between adolescents with and without reading difficulties	The sample consisted of 188 adolescents (55% male, ethnically diverse) 94 with poor reading skills and 94 with typical reading skills recruited from a larger sample of 15-year old public school students	The reading difficulties group were those with raw scores of 45 or below on the word-reading sub-test of the Woodcock-Johnson Psycho-educational Battery Revised (Woodcock and Johnson, 1990)	USA. The students were recruited from 4 urban and 2 rural schools	Psychiatric disorders (affective disorders, ADHD, conduct and oppositional disorders, substance use disorders) were assessed by child and parent report with the Schedule for Affective Disorders and Schizophrenia for School-age children Epidemiological version (K-SADS-E; Orvaschel & Puig-Antich, 1994)	**Individual-level**: Children's "functional impairment" was assessed with the Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 1997). This tool measures impairment in five domains: role functioning, behaviour towards others, mood/self-harm, substance abuse and thinking	Longitudinal design, adolescents only.	Adolescents with reading difficulties, relative to typical readers, evidenced higher rates of functional impairment and anxiety disorders even after controlling for co-morbid ADHD, in particular, generalised anxiety and social anxiety (5 times more prevalent) and difficulties in regard to "behaviour towards others" although rates of externalising disorders (conduct and oppositional disorders) did not vary significantly between the groups
Granot (2016) [33]	Socioemotional and behavioural adaptation of students with disabilities: The significance of teacher-student attachment-like relationships	To explore the extent to which children's attachment to their mothers and teachers explains the socioemotional well-being of children with ADHD, Learning difficulties, or combined ADHD-learning difficulties	65 teacher/child dyads including 25 children and adolescents (8-14 years) with learning difficulties (LD), 20 with Attention Deficit Hyperactivity Disorder (ADHD), and 20 with both ADHD/LD	LD was diagnosed based achievement at least 2 years below that expected for grade level with no intellectual, sensory, neurological, or socio-cultural explanation. The number with reading difficulty within the LD	Northern Israel	Children's internalising/externalising symptoms were assessed by teacher report using the Teacher-Child Rating Scale (TCRS; Hightower et al., 1986)	**Family/Community-level**: Children's perception of their attachment to mothers was assessed by the ASS (Kernes et al., 1996) and attachment to teachers with the CATSBS (Al-Yagon & Mikulincer, 2006). The full name of these measures was not provided	Cross-sectional. A series of regressions were used to identify the contribution of the child-mother, child-teacher attachment relationship to children's psycho-social wellbeing	Greater maternal attachment was associated with reduced child internalising symptoms across the groups. Similarly, secure child-teacher attachment was associated with reduced externalising symptoms

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				group was not specified					
Haager & Vaughn, 1995[34]	Parent, teacher, peer, and self-reports of the social competence of students with learning disabilities	The social competence (social skills, behaviour problems, peer relations, self-perceptions) of children with learning difficulties was compared to that of children without learning difficulties but those who were achieving at low and high academic levels	Three groups of elementary school aged children (Learning difficulties group; low achieving group; and high achieving group)	Learning difficulties had been diagnosed in accordance with DSM-3 criteria (APA, 1987). The number with reading difficulties was not described	USA. Participants were recruited from three elementary schools in a large metropolitan school district in south-eastern United States. Children in the LD group spent 50% of their time in mainstream school settings	Teachers and parents reported on internalising and externalising symptoms among children with the behaviour problems sub-scale of the relevant versions of the Social Skills Rating Scale (teacher and parent versions) (Gresham & Elliot, 1990)	**Individual-level**: Teachers, parents and children rated children's social skills with the relevant versions of the SSRS. **Community-level**: The researchers also gauged children's social experiences by asking children to nominate three classmates they liked the most and three they liked the least - this gave an indication of peer liking/popularity of each child	Cross-sectional. MANOVAs were used to analyse the data	Overall, students who were high achieving academically had fewer social and behavioural difficulties. Students with learning disabilities were rated as having more internalising symptoms (parent report), fewer social skills and more behavioural problems (teacher report) and were less liked by peers than high achieving students. However, students with learning difficulties did not appear to experience the same level of peer rejection as low achieving students without learning disability
Heiervang et al. (2001)[35]	Behaviour problems in children with dyslexia	To investigate the association between dyslexia and behaviour problems (internalising/externalising) among children with and without dyslexia	A population sample of 10–12-year-old (4th grade) children, 25 with dyslexia and 25 without any known learning difficulty	The dyslexia group was determined by the researchers based on performance on tests of spelling, single word reading, and phonological decoding strategies and exclusion criteria consistent with DSM criteria	Bergen, Norway. Children were recruited through primary schools	Parents, teachers and children completed the relevant versions of the Child Behaviour Check-List (CBCL; Achenbach, 1991) in order to assess both internalising and externalising symptoms	**Individual-level**: The factor of interest to this review is the children's pre-school spoken language ability. This was assessed by parent reported language difficulties requiring speech and language therapy and not by a diagnosis or the use of standardised tests	Cross-sectional. Data analysed with Kolmogorov-Sminov 2-sample test	Children with dyslexia had significantly more internalising symptoms according to parents and teachers; significantly more externalising problems according to parents; but no significant group differences were reported according to children themselves. Parents reported more pre-school language problems among the children with dyslexia
Heying (1987) [36] Doctoral thesis	Social competence in reading disabled boys with and	To compare boys with ADHD with and without co-	The sample consisted of three groups of children (aged 7-12	The groups were defined through the research process	The ADHD/LD group were recruited through specialist	Children's behavioural problems (internalising/externalising) were measured by mother's report with the relevant sub-scales	**Community-level**: Children's social competence was measured by the	Cross-sectional. ANOVA used to analyse data	Boys with co-morbid ADHD/RD experienced significantly more social and behavioural difficulties than boys

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	without attention deficit disorder	morbid learning difficulties on measures of social competence and behavioural difficulties	years, all male); boys with reading disability without ADHD (n = 16); those with co-morbid RD/ADHD (n= 21); and those with no known learning or attentional difficulty (control group, n = 20)	based on standardised measures of reading and attentional difficulties	support services and the control group from one catholic school. San Diego, USA	of the Child Behaviour Check-List (CBCL) and The Conners Parent Rating Scale - Revised (CPRS-R; Goyette, et al. 1978)	social competence scale of the CBCL. This generates three scores: Activities (e.g., participation in hobbies and jobs), Social (peer relationships), and School (e.g., academic performance)		with reading difficulties without co-morbid ADHD or boys with neither attentional or reading difficulties. No major group differences in social competence and behaviour were reported between the latter two groups. According to mothers', boys with ADHD/LD had less contact with friends and out of school organisations and poorer school performance. The findings, according to the researcher, suggest that that attentional, rather than reading difficulties, account for social and behavioural difficulties among some children
Hirsh (2014) [37] Doctoral thesis	Emotional responses to the reading difficulties experienced by young children enrolled in Title I: A qualitative study of students', teachers', and families' perspectives	To explore the reading-related dispositions, emotions, and experiences of young struggling readers from parent, teacher, and child perspectives	The sample consisted of 23 second and third grade children (and their parents and teachers) classified as poor readers by their school and receiving reading remediation	The children had been classified as struggling readers by their school and were in a pullout program for reading remediation	USA. The research was conducted in a public elementary school in a suburb of Pittsburgh, Pennsylvania	In exploring emotional responses to learning/reading the researcher investigated children's anxiety	**Individual-level:** Children's shame and embarrassment **Community-level:** the influence of peer relationships on children's wellbeing	Qualitative design informed by grounded theory	Findings suggest that children who struggle to read often experience emotional distress, anxiety, and try to avoid reading-related tasks. Further, that a reason for the anxiety and avoidance could be fear of teasing and/or embarrassment/concerns about what their peers think of them. The researcher suggested that teachers may misinterpret children's avoidance of reading-related tasks as a negative attitude/low motivation towards reading rather than considering these social considerations
Horbach et al. (2020)[38]	Development of behavior problems in children with and without Specific	To investigate the role of ADHD as a mechanism linking childhood SLD with	The sample consisted of 292 children (at time-point 1; kindergarten, 166 boys, and	Children were classified with SLD in grade 5 if they performed below the 16th	Germany. The sample derived from a longitudinal study which tracked mono-lingual	Parents reported on children's internalising/externalising symptoms with the Child Behaviour CheckList (CBCL)	**Community-level:** Parent's also reported on children's social problems with the social problems	Longitudinal design. Growth component models were used to assess change in behaviour	Children with SLD (without ADHD) in contrast to those with ADHD, appeared to have stable behaviour over time according to parents. Children with ADHD (with and without

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	Learning Disorders in reading and spelling from kindergarten to fifth grade	emotional and behavioural problems	126 girls) tracked to year 5, the first year of secondary school	percentile ranking in at least one domain (spelling or reading). 33% of the sample with SLD had co-morbid ADHD compared to 3% in the group without SLD	German schoolchildren from kindergarten to fifth grade on their reading development and other factors		sub-scale of the CBCL	problems (internalising, externalising, attentional difficulties, social difficulties) over time	SLD), in contrast, developed more internalising/externalising behaviour over time and appeared to be especially vulnerable during times of transition such as school entrance. Regarding social difficulties, children with SLD seem to be particularly vulnerable when they first started school, and emotional/attentional difficulties peaked for these children in the last year of primary school
Hossain et al. (2021) [39]	The association between anxiety and academic performance in children with reading disorder: A longitudinal cohort study	To examine the association between overall academic performance and anxiety among children with reading disorder	One hundred and twenty-eight children and adolescents (aged 7-14 years) with reading disorder	All participants were required to have a RD to be enrolled in the schools and the study	USA. Participants were recruited from 3 schools which specialise in teaching students with reading disorder	Children's anxiety was initially measured with the School Anxiety Scale -Teacher Report (SAS-TR; Lyneham et al., 2008) but at later time-points was measured by the 8-item version of Spence's Children's Anxiety Scale (Teacher and parent versions) (SCAS; Reardon et al., 2018)	**Individual-level:** academic performance was the outcome variable in this study and was measured by teacher ratings of academic progress by survey items of the researchers own design	A 2-year longitudinal cohort study. Tracked children for three years	Children's anxiety symptoms were significantly negatively associated with their academic performance both cross-sectionally and longitudinally. Anxiety was significantly associated with reduced academic performance over time
Hossain et al. (2022) [40]	The role of grit and resilience in children with reading disorder: A longitudinal cohort study	To investigate whether grit and resilience were associated with academic performance, anxiety, depression, and quality of life among children with reading disorder	One hundred and sixty-three children and adolescents with reading disorder (6-16 years) participated	All participants were required to have an RD to be enrolled in the schools and the study	Participants were recruited from 3 schools in the San Francisco area of the USA. The schools specialised in working with students with reading disorder	Anxiety, as above. Depression – measured by the Short Mood and Feelings Questionnaire (SMFQ) and children's Quality of Life was measured by parent report with the Paediatric Quality of Life Inventory 4.0 (Varni et al., 2001). This scale assesses QOL across four domains: physical, emotional, social, and school functioning	**Individual-level:** aspects of children's coping ability, namely, grit and resilience were measured by teacher and parent report with the Grit and Resilience Scale designed by the researchers for this study's purposes. Academic performance was also an outcome variable and was	Three-year longitudinal cohort study. Repeated measures analysis using linear mixed-effects models were used to investigate associations between variables	After adjusting for age and sex, higher levels of grit and resilience were significantly related to improved mental health, academic performance, and Quality of Life among students with reading disorder

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							measured by teacher ratings.		
Hughes & Dawson (1995)[41]	Memories of school: Adult dyslexics recall their school days	To explore schooling experiences from the retrospective perspective of adults with dyslexia	Forty-seven adults (30 males and 17 females, age range 19-51 years, Mage = 31 years) 45% were in employment, 36% were unemployed and 19% were full-time students	All participants were attending or had attended the Winchester Dyslexia Institute for tuition for at least one term	USA	The emotional experience of schooling is explored. The survey contained questions which gauged perspectives on both internalising (e.g., "I was withdrawn and shy") and externalising (e.g., "Teachers generally thought I was badly behaved") symptoms	**Individual-level:** self-esteem, shame, academic performance and the effect of being labelled "lazy". **Community-level:** Teachers' misunderstandings/misconceptions, peer problems and bullying	Mixed methods. A survey which contained both open and closed questions. Responses were analysed both quantitatively and qualitatively	The findings of this study suggested to the researcher that a cycle of poor academic performance, and being misunderstood and/or bullied by others, contributes to emotional distress amongst students with dyslexia
Ihbour et al. (2021)[42]	Mental health among students with neurodevelopmental disorders: Case of dyslexic children and adolescents	To assess self-esteem, anxiety and depression and co-morbid psychiatric conditions among Arabic speaking children and adolescents with dyslexia relative to those without dyslexia	A sample of 205 children and adolescents attending mainstream schools; 56 with dyslexia (41 boys and 15 girls Mage = 12.1 years and 149 good readers (63 boys and 86 girls, Mage = 11.71 years)	Children in the dyslexia group had been previously identified as having dyslexia. This was validated through a timed word-reading test and teacher reports	The schoolchildren were recruited from the Beni Mellal-Khenifra region of Morocco	Children/adolecents self-reported on their level of depression symptoms with the Beck-Depression Inventory (BDI; Beck et al., 1996) and their level of anxiety symptoms with Taylors Inventory of Manifest Anxiety (Taylor, 1953)	**Individual-level**: Children reported on four domains of self-esteem: general, family, social and school, with the school version of the Coopersmith Self-Esteem Inventory (SEI; Coopersmith, 1984)	Cross-sectional design. Children with and without dyslexia were compared on the psycho-social variables. This was followed by a correlational analysis of three variables (self-esteem, depression and anxiety) in each of the two groups	Children, and adolescents with dyslexia, regardless of gender, reported significantly higher levels of depression, anxiety, and poorer overall self-esteem (across all four domains). Furthermore, the researcher found significant associations between poor global self-esteem and anxiety and poor social self-esteem and depression among children/adolescents with dyslexia
Ilardi (2010) [43] Doctoral thesis	Maternal mentalization and child psychosocial adaptation for children with learning and behavioral disorders	To investigate whether mothers ability to mentalise her child's internal experience (referred to as mother's reflective capacity) is associated with their child's	The sample consisted of 18 mother/child dyads. The children were all diagnosed with or regarded as at risk for Attention-Deficit/Hyperactivity Disorder, a	Reading difficulties were determined based on children's word-reading and reading comprehension performance on sub-tests of the Wechsler Individual	USA. The children were recruited as part of a larger longitudinal study	Children's psycho-social functioning was the outcome variable and was measured by parent-report using the Child Behaviour CheckList (CBCL; Achenbach, 1991) and the Social Skills Rating System (SSRS; Gresham & Elliot, 1990)	**Family-level**: Mother's mentalisation capacity was measured through a structured interview (the PDI-2R). It is a concept that reflects the ability of mothers to reflect on their own feeling states	Mixed methods design. Mothers were interviewed about family dynamics and attitudes to their child's learning difficulties and completed standardised measures	Improved maternal mentalization was associated with higher levels of parent-reported social skills among children in this sample but was not significantly associated with children's internalising/externalising symptoms

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		psycho-social wellbeing	Reading Disorder, or a Language Impairment and were between age 7-10 years	Achievement Test – 2nd Edition (WIAT-II)				of child behaviour	
Ingesson (2007) [44]	Growing up with dyslexia: Interviews with teenagers and young adults	To explore how "young people with dyslexia experience school in terms of wellbeing, educational achievement, self-esteem, peer relations and belief in their future" (p. 574, Ingesson, 2007)	75 adolescents and young adults (48 males, age range 14-25 years, Mage = 19 years)	All had a formal diagnosis of dyslexia adhering to DSM-4 (APA, 1995) and ICD-10 (WHO, 1992) criteria using an IQ discrepancy approach	Sweden	Measured by one interview question: "How do/did you feel in school on the whole, in terms of wellbeing?" possible answers were on a 5-point Likert scale from very bad to very good	**Individual/Community-level**: self-esteem, focusing on strengths, having more educational choice, early diagnosis, and bullying victimisation	Mixed method approach. Responses from semi-structured interviews were categorised and assigned numerical values which were then analysed via Spearman correlation	The findings of this study suggested to the researcher that the the first 6 years of schooling were most difficult for many children with dyslexia. Improved self-esteem and wellbeing among secondary school students may result from students having greater choice in school subjects and being able to compartmentalise their difficulties. Early diagnosis and focusing on strengths were constructed by the researcher as being protective of students' wellbeing
Iyanda (2021)[45]	Bullying victimization of children with mental, emotional, and developmental or behavioural (MEDB) disorders in the United States	To investigate the association between bullying victimisation and various health outcomes (including anxiety and depression) among children with a range of mental, emotional, developmental, and behavioural (MEDB) disorders	23, 494 children and adolescents via a large population-based sample (Mage = 11.65 years, 5 - 17 years) including a group classified as having a learning disorder	Determined by parent response to a survey item querying their child's MEDB status	The data was collected across 50 states within the USA	The prescence of anxiety or depression was determined by parent response to survey items	**Community-level**: bullying victimisation determined by one item on the parent survey related to their perception of their child having been bullied over the last 12 months - response format Y/N	Cross-sectional. Multivariate logistic models were used to conduct the analysis	Prevalence of bullying victimisation in the learning difficulties group (aged 6-17 years) was 11.9%. It was highest amongst adolescents with learning difficulties (14.2%) relative to younger children with learning difficulties (9.7%). Furthermore, bullying victimisation was positively associated with anxiety and depression in the sample of children with MEDB broadly

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Jordan & Dyer (2017)[46]	Psychological wellbeing trajectories of individuals with dyslexia aged 3-11 years	To investigate age of onset and direction of effects of psycho-social difficulties in children with dyslexia in comparison to typically developing children and those with other special educational needs	The researchers used data from the UK Millennium Cohort (n = 7224 from 2003 - 2011) and tracked children from age 3-11 years	Dyslexia diagnosis was provided by teacher report	United Kingdom	Measured by teacher and parent report with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)	**Individual/Community-level**: Pro-sociality and Peer problems measured by teacher and parent report by the relevant sub-scales of the SDQ	Longitudinal design. Growth curve modelling controlling for age, race, gender, and family income was used to analyse the psycho-social variables by group	Onset of psycho-social difficulties among children with dyslexia appeared to occur when they commenced school suggesting to the researcher that they are secondary consequences of school experiences
Kempe et al. (2011)[47]	A longitudinal study of early reading difficulties and subsequent problem behaviors	To investigate the direction of effects between reading difficulties and a variety of "problem behaviors"	The sample consisted of 360 children recruited at kindergarten age	25% of the sample were identified as "at risk" for reading difficulties based on kindergarten word-reading scores. The groups (reading difficulty and no reading difficulty) were redefined based on reading scores at grade 3	Sweden. Children were recruited from 14 schools. All spoke Swedish as their first language	Internalising/externalising (aggression) symptoms reported by parents with the Child Behaviour CheckList (CBCL; Achenbach, 1991)	**Community-level:** children's social problems reported by parents using the relevant sub-scale of the CBCL	Longitudinal design. Children were tracked from kindergarten to grade 3 and data analysed using ANOVA with group as between-subjects factor and time as within-subjects factor	The only consistent finding across time was a positive association between reading difficulties and inattention. In this sample, reading difficulties were not associated with internalising symptoms. However, relative to parents of children without reading difficulties, parents of children with reading difficulties reported that their children experienced more social difficulties which were present even before they started school and which didn't change over time
Konstantareas & Homatidis (1989)[48]	Parental perception of learning-disabled children's adjustment problems and related stress	To investigate parental perceptions of child behaviour problems and how this is associated with parental stress	The sample consisted of 56 parents and their children (n = 28), all diagnosed with learning difficulties, 6-16 years, 20 boys and 8 girls)	All children met DSM-3 criteria for learning difficulties and were tested on a battery of tests focusing on language-related skills	Canada	Child internalising/externalising symptoms were assessed by parent report with the Child Behaviour CheckList (CBCL; Achenbach & Edelbrock, 1981)	Of interest to this study, the following **family-level factors** were measured: parental stress measured by a 5-item scale of the researchers own design; parent's locus of control (measured by the Rotter (1966) scale;	Cross-sectional	A positive association between child behavior problems and higher levels of parenting stress and lower levels of paternal self-concept was found. Maternal stress was higher among mothers who had an external locus of control.

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							and parental self-concept measured by Coopersmith (1967) short-form, were investigated		
Kopelman-Rubin et al., (2020)[49]	The relationship between emotion regulation, school belonging, and psychosocial difficulties among adolescents with Specific Learning Disorder	To explore the influence of emotion regulation and school belonging on the psychosocial wellbeing of adolescents with a Specific Learning Disorder (SLD)	249 Hebrew speaking adolescents from 11 public schools all diagnosed with an SLD (Mage = 12.67 years, 146 boys)	SLD diagnosis met DSM-5 criteria (APA, 2013). Sub-type of learning disability was not described	Israel. Participants were recruited from a variety of schools	Was assessed by child self-report using the Total Difficulties score of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)	**Individual-level:** Children's emotion regulation, measured by the General Expectancy for Negative Mood Regulation Scale (Catanzara & Mearns, 1990) and **Community-level:** student's sense of school belonging measured by the Psychological Sense of School Membership Scale (Goodenow, 1993)	Cross-sectional data was analysed using Pearson correlations and a mediation model	In this study, children's emotion regulation ability was positively correlated with psychosocial wellbeing and this relationship was mediated by their sense of school belonging
La Greca & Stone, (1990)[50]	LD status and achievement: confounding variables in the study of children's social status, self-esteem, and behavioral functioning	To examine associations between academic achievement, and social and behavioural difficulties among children with learning difficulties and the influence of gender on interpersonal relationships	57 children with learning difficulties (38 male) and a comparison group of 490 without learning difficulties (233 male) all school grades 4-6. The comparison group was divided into an academic low and high achieving group. All groups matched	Learning difficulties group was based on meeting IQ-discrepancy diagnostic criteria. Sub-type of learning disability was not described	Participants were selected from four public schools located in working and middle-class neighbourhoods in Florida USA. All children with learning difficulties spent at least 50% of their school day in mainstream classes	Classroom teachers reported on child mental health using the Revised Behaviour Problem Checklist (RBPC; Quay & Peterson, 1987). This study used three of the subscales: Conduct disorder, Anxiety/Withdrawn, and attention problems	**Individual-level:** child global and social self-perception, measured by the relevant sub-scales of Harter's self-perception profile for children (SPPC; Harter, 1985). **Community-level:** "Peer liking" measured by a rating scale whereby each child was asked how much they would like to "play" with a classmate	Cross-sectional. The data from the three groups were compared on all the child and teacher ratings using two factor (Group x Sex) analysis of variance	Children with learning difficulties were given significantly lower ratings of peer liking and higher ratings of peer rejection than the other two groups. Children with learning difficulties self-reported lower social acceptance and global self-worth than the other two groups. Teachers rated girls with learning difficulties to be anxious/withdrawn. The researchers concluded that their findings suggest that academic achievement alone could not account for the variation in peer acceptance and behavioural difficulties

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			for age, gender, race						
Lawrence et al. (2019)[51]	Effects of positive parenting on mental health in adolescents with learning difficulties	To explore the effect of family (parental mental health, family functioning and parenting practices) and adolescent social and emotional competencies on the mental health of adolescents with learning difficulties	Participants were a population sample of 24, 915 14–15-year-old adolescents (41% female, Mage = 14.47 years) and a corresponding parent	A sub-group of 5.9% of the sample were reported by parents as having a diagnosed learning disability. Sub-type of learning disability was not specified	Canada. Secondary data from the National Longitudinal Survey of Children and Youth (NLSCY) Canada	Anxious and depression symptoms (termed "adolescent distress" by the researchers) were assessed by adolescent self-report using the 7-item "behaviour scale" of the NLSCY survey. The NLSCY survey also contained a question whereby parents reported whether their child had a diagnosis of an emotional or psychological difficulty	**Individual-level:** adolescent's socio-emotional competence was measured by self-report with the Emotional Quotient Inventory-Youth Version (EQ-I; YV). **Family-level:** parents reported on family factors with survey items from the NLSCY survey (for parents) and adolescents reported on parenting style with the nurturance and monitoring subscales of the Parents and Me Scale (Lempers et al., 1989). Parental depression was measured with the short version of the Centre for Epidemiological Studies Depression Scale (CES-D scale, Radloff, 1977)	Cross-sectional. Data from one time-point of the longitudinal study were analysed. Direct and indirect effects of all variables on the outcome variable "adolescent distress" was calculated using regression analyses	Adolescent emotional socio-competence and positive parenting relationships (having nurturing parents who were aware of their activities/interests; "parental monitoring") was significantly associated with less internalising symptoms among children with learning difficulties. Parent depression had a small but significant association with adolescents' internalising symptoms, but family functioning was not found to have a meaningful association
Lawrence (2020)[52]	Bridging secondary survey data with in-depth case studies to advance understandings of youth learning	To explore psychological and relational issues among young people with learning and mental health issues	Adolescents. as above	as above	Canada. as above	Measure of youth distress (described above)	**Individual-level:** socio-emotional competence (described above) and also explored through a case study approach **Family-level:** parenting style, child-parent relationship,	Mixed methods design. A path analysis was followed by a case study approach	Findings from the quantitative section found that children's socio-emotional skills, parental mental health, and parental "monitoring" (e.g., having parents that were involved and took an interest in their activities) predicted internalising symptoms among adolescents

166

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	and mental health concerns						and parental mental health (described above) **Community-level factors**: such as friendship were explored in the qualitative section of the study		with learning difficulties. Family functioning was not found to have a meaningful association. Through case study, findings support the view that parental mental health, focusing on strengths, friendships, and skills such as self-awareness and advocacy were protective. Risk factors for mental health concerns were exhaustion from school difficulties, low confidence, and avoidance
Learned (2016)[53]	"The behavior kids": examining the conflation of youth reading difficulty and behavior problem positioning among school institutional contexts	To explore young people's experience of reading difficulties within different contexts (e.g., across space and time)	Adolescents. The participants were an ethnically diverse group of 8 ninth grade high school students; their teachers (n = 8) and a group of peers identified as "proficient readers"	The participants had all received below proficient scores on district-administered standardised reading tests	USA	Behaviour "problems" from teacher and student perspectives were explored	**Community-level**: Student-teacher relationships, labelling and stigma were explored	An ethnographic qualitative approach. The researcher shadowed eight adolescents (all 14 years old) identified as "struggling readers" and interviewed them and their teachers	The analysis suggested that some teachers/school construct a "struggling reader" identity which conflates "behaviour problems" with struggling reader status; that children's "behaviour" was not a result of reading difficulties per se but rather learning environments that "position" these students as "problems". Teaching practices which focus on student's strengths and employ restorative disciplinary practices were posited to be protective of student wellbeing
Leitão et al., (2017)[54]	Exploring the impact of living with dyslexia: The perspectives of children and their parents	To explore the lived experience of children with dyslexia and their parents and investigate reasons why dyslexia might be associated with elevated risk of	13 children and adolescents (aged 10-17 years) and 21 parents (19 mothers and 2 fathers) were interviewed	All child participants had a confirmed diagnosis of dyslexia of at least one year duration	Parents were all members of the Dyslexia SPELD Foundation (DSF) in Western Australia. Child participants were all monolingual English speakers	Mental health was constructed as comprising of both internalising and externalising symptoms and was explored through a semi-structured interview process	**Individual-level**: self-esteem, the effect of receiving a diagnosis, feelings of difference **Family-level**: parent academic and emotional support. **Community-level**: social support, attitudes of others	Qualitative design. A phenomological approach using Braun and Clarke's (2006) thematic analysis method to analyse the data	Internalising rather than externalising symptoms were more commonly reported. Feeling different was an over-arching theme and highlighted broader societal challenges around notions of ability and difference. Social support (peers, parents, teachers) and the explanatory power of diagnosis were also identified as possible protective

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		internalising and externalising symptoms					(teachers, peers), lack of government funding and teacher training, and a strengths-based approach were identified as factors which may contribute to mental health among children with reading difficulties		factors for some children's mental health
Lin et al. (2013)[55]	Reading, mathematics, and behavioral difficulties interrelate: Evidence from a cross-lagged panel design and population-based sample of US upper elementary students	To investigate the direction of effects between reading difficulties and behaviour difficulties over time and the influence of co-occurring mathematics difficulties	The researchers used data from the Early Childhood Longitudinal Study, Kindergarten Class of 1989-99 (ECLS-K), a large population-based sample of 9,324 children attending 966 public and private schools	A reading difficulties group was derived based on performance in the bottom 10% on tests of word reading and reading comprehension administered at both time-points	USA	Internalising/externalising symptoms were measured by teacher report by a survey designed for the ECLS study	**Individual-level:** Whilst the focus of this study was to investigate the direction of effects between reading and behavioural difficulties and the influence of co-morbidity with mathematics difficulties, for the purpose of this review, we were interested in children's social and academic skills which were measured by teacher report by various sub-scales of the ECLS survey	Longitudinal design. Children were assessed at third and fifth grade	Children with reading difficulties in third grade were significantly more likely, according to teachers, to have continued reading difficulties, poor task management, poor self-control, poor interpersonal skills, and internalising symptoms in fifth grade. However, only poor task management in third grade predicted grade 5 reading difficulties
Lindeblad et al., (2016)[56]	Self-concepts and psychological wellbeing assessed by Beck Youth Inventory among pupils with	To investigate the self-image and psychological wellbeing of children/adolescents with dyslexia or severe	67 children and adolescents (aged 10-16 yrs., boys = 48, girls = 19) with reading difficulties attending compulsory school	The students were nominated by their teachers as having reading/writing difficulties. Of the total sample of 67, 21	Sweden	Symptoms of anxiety and depression were assessed by self-report with Beck's Youth Inventory (BYI; Beck et al., 2001) and compared to the Swedish norm group of 2358 children (9-18 years) provided by the BYI manual	**Individual-level:** Children's self-image (measured by self-report with the Beck Youth Inventory) and **Community-level:** attachment/attitude to	Cross-sectional design	The children with reading difficulties in this sample did not report poor self-image or symptoms of depression and/or anxiety relative to Swedish norms. 96% of students reported that they liked school, 89% reported that they felt confident to

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	reading difficulties	reading difficulties		participants were reported to have a dyslexia diagnosis			school addressed through survey items of the authors own design		manage their schoolwork, and 75% reported that they considered reading an easy activity. The researchers speculated that these results may indicate increased teacher understanding about dyslexia and/or pedagogical approaches that suit the needs of children with reading difficulties
Lytton (1968)[57]	Some psychological and sociological characteristics of "good" and "poor achievers" (boys) in remedial reading groups: Clinical case studies"	To investigate factors that contribute to good achievement in remedial educational settings	A group of 12 children classified as "good achievers" (Mage = 8.7 years) and a group of 12 classified as "poor achievers" (Mage = 8.4 years) 8 boys and 4 girls in each group. Students were placed in each group based on their performance on a word recognition reading test and teacher nomination	All children were identified as having a reading disability and were placed in a reading-remediation class	United Kingdom	Teachers and parents reported on children's behaviour and anxiety. A composite score for anxiety for each child was based on these ratings in addition to researcher observations.	**Individual-level:** Of interest to this review were children's academic performance. Furthermore, parents completed a survey which contained items pertaining to children's developmental history (including speech development), learning/reading habits, and social skills (siblings and friends/schoolmates) and **Family-level:** family functioning (e.g., harmony in the home, acceptance of the child)	Cross-sectional. Group comparison design	Of interest to this review, the researcher found that the poor achieving group, relative to the higher achieving group, had higher anxiety, poor speech development in early childhood, and to a lesser extent, poorer family functioning
Mahdavi (2017) [58] Doctoral thesis	The influence of early parent involvement and depression on academic achievement, psychosocial behaviors, and	To investigate how early parenting variables (parent depression and involvement in school) influences academic	The study used data from the Early Childhood Longitudinal Study-Kindergarten (ECLS-K); 10,630 children	The children were identified by their teacher as LD/RD through the ECLS-K survey	USA	Teachers reported on internalising/externalising behaviour with an adapted version of the Social Skills Rating System (SSRS; Gresham & Elliot, 1990)	**Individual-level:** Children self-reported on their motivation for learning, and teachers reported on children's academic and social performance with	Longitudinal design. Structural equation modelling	Of interest to this review, children with learning difficulties, relative to those without learning difficulties, were significantly more likely to have higher levels of internalising/externalising symptoms (teacher-reported), lower motivation to

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	motivation in children with learning disabilities across elementary school	achievement, motivation, and psycho-social development of children (with and without learning difficulties) over time	(51% female) tracked from kindergarten to year 5. A total of 410 identified as having a learning difficulty (180 with reading difficulty and 220 with combined reading and math disability)				items from the ECLS-K survey and the adapted version of the SSRS. **Family-level**: Parents reported on their depression symptoms and involvement at their child's school through items on the ECLS-K survey		learn, and parents who reported depressive symptoms and low involvement at school. Parental depression did not appear to predict children's psychosocial wellbeing. However, findings suggest the importance of parental school involvement for children with and without learning difficulties
Martinez (2002)[59] Doctoral thesis	A comparison of learning disability subtypes in middle school: Self-concept, perceived social support, and emotional functioning	To compare the psycho-social functioning (self-esteem, social support and emotional well-being) of middle school aged students with dyslexia to those considered to be "typically achieving" and those with other types of learning disability	A sample of 120 adolescents: 6th grade (n=33), 7th grade (n=54), and 8th grade (n=33) classified as: having both reading and math disability (LD), reading disability (RD), math disability (MD) and normally achieving (NA).	Learning disability previously assessed using an IQ-achievement discrepancy definition (reading disability based on word reading or word reading and reading comprehension performance)	USA. Participants were recruited from 14 public middle schools in two large school districts in Houston, Texas.	Adolescents reported on their psycho-social functioning with the Behaviour Assessment System for Children (BASC; Reynolds & Kamphaus, 1992)	**Individual-level:** Adolescents reported on their self-esteem/self-perception with the Self-Perception Profile for Learning Disabled Students and the What I Am Like Scale (Renick & Harter, 1988). **Family/Community level:** adolescents reported on perceived levels of social support with the Social Support Scale for Children or People in My Life scale (Harter, 1985)	Cross-sectional design. Multivariate analysis of group differences	Co-morbidity of learning disabilities (but not reading or mathematics difficulties alone), was associated with more depression, lower intellectual and academic self-worth, and lower levels of perceived parent and friend support (but not teacher, class-mate or general social support) relative to adolescents without any learning difficulty
Matteucci et al., (2019) [60]	Health-related quality of life and psychological wellbeing of children with Specific Learning	To explore health-related quality of life and psychological well-being of children with	Thirty children and adoelscents (8-14 years) with a diagnosis of SLD (single or mixed type) and their	Formally diagnosed with SLD according to ICD-10 criteria (WHO, 2018)	Children and mothers were recruited in 2017 from a learning difficulties assessment and	Child mental health was measured by parent report with the Srengths and Difficulties Questionnaire (SDQ; Goodman, 1997; Tobia & Marzochi, 2017); the Test of Anxiety and Depression, parent version (TAD; Newcomer	**Family-level:** Maternal mental health measured by the EQ-5D-5L (Scalone et al., 2015), parenting stress measured by the Italian	Cross-sectional. Group comparison study	Both mothers and children with learning difficulties, compared to those without learning difficulties, reported lower levels of psycho-social wellbeing. Specifically, children with SLD had higher rates of generalised

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	Disorders and their mothers	SLD and their mothers	mothers. Controlled for ADHD or other health conditions (unspecified) but did not specify subtypes of learning difficulty		support centre in Northern Italy. Italian was their first language	et al., 1995) and both child and parent versions of the Paediatric Quality of Life Inventory generic core scales (PedsQL; Varni et al., 2001) which provides a Psychosocial Health score	version of the Parenting Stress Index-Short Form (PSI-SF; Abidin et al., 1990; Guarino et al., 2008) and parenting self-efficacy measured by the Parenting Self-Efficacy Scale (PSE; Wittkowski et al., 2017)		anxiety, school anxiety and depression and their mothers were more likely to report symptoms of anxiety and depression. Fifty percent of mothers of children with learning difficulties reported parental distress and 80% reported a "very poor perceived ability in helping their children with school activities" (p. 51; Matteucci et al., 2019)
Maughan, B. et al. (2003) [61]	Reading problems and depressed mood	To investigate the relationship between persistent/severe reading difficulties and symptoms of depression	A community sample of 1416 children (all boys, and aged 7-10 years at the initial assessment (9.1% designated as having reading difficulties) and their families were assessed at 6-month intervals	Reading difficulties defined as California Achievement Test (CAT) percentile scores at or below 6 at recruitment and continued reading difficulties (percentile scores at or below the 50th percentile)	USA. The sample was taken from the Pittsburgh longitudinal study	Children reported on their depression symptoms from age 6 with the short version of the Mood and Feelings Questionnaire (MFQ; Angold, 1989) and parents reported on disruptive behaviour disorders among children with the Revised Diagnostic Interview schedule for Children (DISC-P, Costello et al., 1982)	Carer and/or children reported on a range of Family-level factors including: child-parent relationship and parenting practices (e.g., physical punishment); parental stress and coping with items from the Pittsburgh Youth Survey designed for the wider longitudinal study	Longitudinal design. Logistic regression was used to test for group differences on dichotomous variables and ordinary regressions for analysis of continuous reading scores	The researchers found robust links between reading difficulties and depressed mood among younger, not adolescent, students which could not be explained by the various family factors nor co-morbid disruptive behaviours. Rather the researchers suggest that the findings support the view of a direct association between reading difficulties and depressed mood
McArthur et al. (2022) [62]	Tracking the relations between children's reading and emotional health across time: Evidence from four large longitudinal studies	To investigate mechanisms responsible for the relationship between reading difficulties and emotional health across childhood	Used four longitudinal databases: one from the United Kingdom (n = 7,870), two from the United States (ns = 8,001 and 7,160) and one from Australia (n = 768). The researchers focused their	All included studies utilised standardised measures of word-reading and other reading difficulties as criteria	Samples derived from English speaking countries	All included studies incorporated standardised measures of internalising/externalising symptoms however measures varied across studies	In addition to attentional difficulties, modifiable individual-level factors of self-concept and Community-level factors: peer problems/bullying were investigated. Parental mental health was measured in one of the datasets, but the findings were not published	All included studies were longitudinal by design. The researchers analysed the data using Structural Equation modelling	The findings support the view that reading difficulties precede emotional and peer difficulties developmentally across childhood (and not vice versa). Specifically, reading difficulties at approximately age 7 predicted age 9 and/or 11 anxiety, depression, poor reading self-concept, bullying and other peer difficulties. In contrast, findings supported the view that behaviour difficulties (externalising

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			analysis on data from primary school aged children				in the main section of the article and are therefore not included in this review.		behaviour) preceded later reading difficulties
Mercer (2004) [63] Doctoral thesis	Relations of self-efficacy to symptoms of depression and anxiety in adolescents with learning difficulties	To investigate relationships between self-efficacy and symptoms of depression and anxiety amongst adolescents receiving support for special education services; a subset of whom were identified as having reading difficulties	83 adolescents (13-17 years, 24 female) divided into two subsets, those with reading difficulties (n = 25) and those who met traditional aptitude-achievement discrepancy criteria for learning disability	All diagnosed as having learning disabilities according to Ministry of Education criteria. However, (n = 46) had below average performance (at or above a standard score of 80) on cognitive ability, or did not present with a discrepancy of at least 1.5 SD's between cognitive ability and academic achievement	The children were recruited from 13 public schools in British Columbia, Canada. All were receiving special education support at school. 91.6% spoke English and 95.2% were born in Canada	Symptoms of depression were measured by self-report with the second edition of the Reynolds Adolescent-Depression Scale (RADS-2; Reynolds, 2002) and anxiety symptoms with the Multi-dimensional Anxiety Scale for Children (MASC; March et al., 1997)	**Individual-level**: Children reported on their reading self-efficacy, academic self-efficacy, emotional self-efficacy, and social self-efficacy using a measure of the researchers own design. **Family and Community-level**: Children reported on their perceived levels of social support from parents, friends, and teachers using the brief version of the Social Support Questionnaire (SSQ; Sarason, 1987). Children also reported on their experience of life events (and their rating of them as negative, neutral or positive) with an adapted version of the Life Events Questionnaire (LEQ; Newcomb et al., 1981), which provides an indication of children's perception of stress,	Cross-sectional.	Children with word-reading difficulties had lower reading self-efficacy than others. However, emotional, and social self-efficacy, more adverse life experiences and lack of social support, rather than poor academic or reading self-efficacy, predicted symptoms of depression and anxiety. The researcher concluded that in this sample socio-emotional rather than academic factors were more associated with anxiety/depression symptoms

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							according to the researchers		
Michaels & Lewandowski (1990) [64]	Psychological adjustment and family functioning of boys with learning difficulties	To investigate associations between learning difficulties, family functioning and behavioural (internalising and externalising) difficulties	The sample consisted of 59 children with learning difficulties and 65 without learning difficulties (all male and aged 6-12 years) and their parents	Previously diagnosed based on an IQ-achievement discrepancy by the Committee on Special Education within their school districts. The number with reading disability was not described	USA. Children were recruited from urban and suburban settings	Parents reported on their child's internalising and externalising symptoms with the Child Behaviour CheckList (CBCL; Achenbach & Edelbrook, 1983)	**Individual-level**: Parent's reported on their child's social competence with the social competence sub-scale of the CBCL. **Family-level**: Parent's also reported on family functioning with the Family Adaptability and Cohesion Evaluation Scale (FACES III; Olson, Portner & Lavee, 1985)	Cross-sectional. Group comparison design and ANOVA to analyse interaction between family functioning and the boys' psychosocial wellbeing	Boys with learning difficulties had higher levels of parent-reported internalising/externalising and total problem behaviour (but not aggression) relative to boys without learning difficulties. Interaction between internalising/externalising symptoms and family functioning was not significant. Nevertheless, poor family functioning in both groups was associated with lower social competence
Morgan et al. (2008)[65]	Are reading and behavior problems risk factors for each other?	To investigate the direction of effects between reading and behavioural difficulties over time	The sample included 11,515 children (50% male, average age of 65.6 months at first time-point) participating in the Early Childhood Longitudinal Study- Kindergarten Cohort (ECLS-K)	Reading scores were dichotomised based on worse 10% (reading difficulties group) or top 90% (comparison group) performance on word-reading, vocabulary and comprehension	USA	Teachers reported on internalising/externalising behaviour with an adapted version of the Social Skills Rating System (SSRS; Gresham & Elliot, 1990)	**Individual-level**: children's interpersonal skills, self-control, and study skills (e.g., task engagement) measured by teacher report using the same measure	Longitudinal design. Children were assessed in first grade and then again in third grade	Children who had reading difficulties in first grade were significantly more likely to display poor self-control, poor task engagement and higher levels of both internalising and externalising behaviours in third grade. There were no significant group differences in teacher-reported inter-personal skills
Morgan et al. (2012)[66]	Do poor readers feel angry, sad, and unpopular?	To investigate whether being poorly skilled in reading contributes to self-reported emotional and social difficulties	The sample consisted of 2, 751 children participating in the Early Childhood Longitudinal Study- Kindergarten Cohort (ECLS-K)	Children were identified as poor readers if they scored in the bottom 10% on their grade 3 ECLS-K reading test. This test measured word-reading,	USA	A NCES-modified version of the Self-Description Questionnaire-I (SDQ-I; Marsh, 1990) was used to gather children's perceptions on their internalising and externalising symptoms	**Community-level**: The version of the SDQ-I used in this study also contained a sub-scale to measure children's perceptions of peer problems	Longitudinal. Data was collected when children were in grade 3 and then again in grade 5	Children who were identified as poor readers in grade 3, relative to typically reading peers, were more likely to report higher levels of internalising (sad); externalising (angry, distractible); and social problems (lonely and unpopular) in grade 5

Author (Date)	Title	Aim of study	Population	Learning/Reading Difficulties	Context	Mental Health Concept	Third factor of interest	Methodology	Key findings
				receptive vocabulary and reading comprehension					
Newbury, et al. 2020)[67]	Cognitive, non-cognitive, and home environment correlates of reading difficulties in primary-grade students with language impairment	To investigate associations between cognitive, noncognitive (behaviour problems, social competence, effortful control), and home environment factors and reading difficulties among children with language impairment	The sample included 165 public school kindy-grade 1 children receiving intervention for language difficulties	The researchers determined a group of children with reading difficulties (36% of the sample) based on performance 1-SD below the norm on standardised tests of letter-word identification and word attack	United Kingdom. This study used data from an existing longitudinal study (The STEPS study) exploring children's speech-language therapy experiences in primary school	Children's internalising and externalising behaviour was measured by parent report using the relevant sub-scales of the Social Skills Rating Scale (SSRS; Gresham & Elliot, 1990)	**Individual-level**: children's "effortful control", and their social competence were also reported by parents with the relevant sub-scales of the SSRS. **Family-level**: "household factors", specifically, the amount of literacy-based activity that occurs in the home (measured with the HLE; Bennet et al., 2002) and family functioning (specifically the levels of "chaos and confusion" in the home) were reported by parents with the CHAOS questionnaire (Dumas et al., 2005)	Cross-sectional. Logistic regression models were used for the analysis	The researchers found that more behaviour problems and poorer social competence, but not "household factors", significantly predicted greater reading difficulties
Novita. S., (2016) [68]	Secondary symptoms of dyslexia: A comparison of self-esteem and anxiety profiles of children with and without dyslexia	To compare anxiety and self-esteem profiles in children with and without dyslexia	124 children (aged 8-11 years), 60 with dyslexia (Mage = 9.23 years) and 64 without (Mage = 8.86) matched for IQ, gender, and school grade. The control	Group membership was determined by the presence of a dyslexia diagnosis by qualified psychologists in accordance to DSM-5 (APA, 2013) and/or ICD-10	Germany. The data was collected from six schools and one clinic for children with special educational need	Anxiety was measured by child report using the Spence Children's Anxiety Scale (SCAS; Spence, 1998) which has sub-scales measuring 6 different types of anxiety and provides a total anxiety score	**Individual-level**: Children reported on their self-esteem with the Self-esteem test for Children and Adolescents (Schauder, 1991). This measure provides a global self-esteem score but also contains sub-	Cross-sectional data was analysed using ANOVA with the various types of self-esteem and anxiety as the dependant variables and dyslexia as the independent variable	Dyslexia was associated with higher levels of generalised (but not other types) of anxiety and low school (but not other domains) of self-esteem

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			group had no history of learning or other specific difficulties and were recruited schools	(WHO, 2013) criteria			scales to measure school self-esteem, home self-esteem, and self-esteem during free time		
Novita et al., (2019) [69]	Children with dyslexia in different cultures: Investigation of anxiety and coping strategies of children with dyslexia in Indonesia and Germany	To investigate anxiety and coping strategies of children with and without dyslexia in two different cultural settings (Indonesia and Germany)	124 children (8-11 years) approx. 50% with a dyslexia diagnosis, 64 from Indonesia and the rest from Germany	29 of the Indonesian children and 31 of the German children had a dyslexia diagnosis. The Salzburg Test of Reading and Writing was administered during the research process (STRT; Landerl et al., 1997) to verify group membership	All German children came from 2 schools whereas all of the Indonesian children without dyslexia came from one school and those with dyslexia came from several schools in different states	Children reported on their anxiety with the Spence Children's Anxiety Scales (SCAS; Spence, 1994)	**Individual-level**: Children reported on their coping strategies with the Children's Coping Questionnaire (CCQ; Dissanayake, 2006)	Cross-sectional. Five ANOVAs by group were conducted	Children with dyslexia reported higher levels of generalised and separation anxiety but dyslexia had insignificant main effects on coping. Culture but not dyslexia status influenced children's coping strategies in this sample
Operto et al., (2021)[70]	Neuropsychological profile, emotional/behavioral problems, and parental stress in children with neurodevelopmental disorders	To investigate emotional-behavioural problems and parental stress among 3 groups of children with neurodevelopmental differences including a group with Specific Learning Disorder (SLD)	62 children (and their parents) in total; a group diagnosed with Autism Spectrum Disorder – High functioning (n = 19); ADHD (n = 21); and SLD – mixed type (n = 22, 14 males, Mage = 9.77) and a typically developing control group (males = 11,	All children in the SLD group were formally diagnosed by two experienced neuropsychologists according to DSM-5 criteria (APA, 2013)	The clinical samples were recruited via the Child and Adolescent Neuropsychiatry Unit at the University Hospital of Salerno (Italy)	Children's internalising/externalising symptoms were measured by parent report on the Children's Behaviour CheckList (CBCL; Achenbach & Rescorla, 2001)	**Family-level**: parental stress was measured by the Parenting Stress Index Short-Form (PSI-SF; Abidin, 1995)	Cross-sectional. Group differences were assessed using Kruskall-Wallis Ttests and U-Mann Whitney tests	Parental stress and child mental health concerns were higher across all three of the disability groups compared to controls

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			Mage = 10.88 years)						
Palti (1998) [71] Doctoral thesis	A study of the socio-emotional aspects of educationally resilient dyslexic students	To investigate socio-emotive factors relating to educational resilience among children with dyslexia	The sample consisted of eighty children (7-11 years, all boys) with dyslexia	All the boys in the sample were formally diagnosed with dyslexia following parent/teacher concern and using the ability-achievement definition of dyslexia	United Kingdom	Parents reported on children's social, emotional, and behavioural functioning using a single open-box item on a questionnaire of the researchers own design. The teacher questionnaire had a section where the teacher can tick whether they perceived the child to experience certain internalising (e.g., anxious) or externalising (e.g., aggression) behaviour	**Individual-level**: Children's educational resilience was measured using standardised tests of literacy skills. Children also reported on their self-esteem by self-report with the BIG Steem Questionnaire (Maines and Robinson, 1988).	Mixed methods and group comparison study. Boys with dyslexia who performed better academically (referred to as "academically resilient") were compared on socio-emotional variables to those who were performing less well academically	The educationally resilient boys with dyslexia reported higher levels self-esteem but more socio-emotional difficulties compared to those categorised as less educationally resilient. From this, the researcher suggested that boys with dyslexia who are educationally resilient may "pay an emotional cost for their academic success" (p.127)
Panicker & Chelliah (2016)[72]	Resilience and stress in children and adolescents with Specific Learning Disability	To assess the level of stress, resilience, depression and anxiety among two groups of children; those who have Specific Learning Disability (SLD) and those who have Borderline Intellectual Functioning (BIF)	The sample consisted of children and adolescents (age range 7-17 years, Mage = 12.15 years, 92% male); 41 diagnosed as having an SLD; and a comparison group of 41 diagnosed as having borderline (IQ 75-79) intellectual functioning. Psychiatric co-morbidity was present in 41% of the sample with SLD (13% had co-	Diagnosis for SLD was assessed by a qualified clinical psychologist based on performance two standard deviations below their current academic year at school in spite of having normal intellectual functioning. Twenty seven percent of the sample of children/adolescents with SLD had reading disorder	India. Ninety eight percent of the children in the SLD group were attending mainstream schools	Depression, anxiety, and stress were measured by the 42-item self-report Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995)	**Individual-level**: Children's levels of stress (measured by the DASS) and resilience (measured by the Resilience Scale-14 (RS-14; Wagnild, 2009) which measures an individual's capacity to manage life challenges and stressors. **Family-level**: parent's level of awareness about their child's learning difficulties was measured through an interview schedule of the researchers own design	Mixed methods design	75% of students with SLD had low level of resilience and 51% were "reprimanded" by their parents for not performing well academically even though 91% of parents were aware that their child had an SLD. Parents reported low levels of SLD specific training. However, these parental factors were not associated with children's self-reported levels of resilience, stress, anxiety and depression. In this sample, the SLD group reported higher levels of anxiety relative to the BIF group and children with reading difficulties had statistically significant higher levels of anxiety than those without reading difficulties. Of those with SLD, 14.2% reported severe depression;

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			morbid ADHD; 3% with depression and 2% with anxiety) and 27% with BIF						23.8% of children reported severe anxiety; and 16.6% reported severe stress
Parhiala et al. (2015)[73]	Psychosocial functioning of children with and without dyslexia: A follow-up study from ages four to nine	To investigate the psycho-social functioning of children with dyslexia before and after the transition to primary school.	Tracked the development of 170 children (half at risk of reading difficulties and half not) over the transition from home to school.	After grade 2 a dyslexia group (n = 39 children, 20 girls and 19 boys) was formed. They fulfilled diagnostic criteria for dyslexia using standardised tests of word-reading difficulty	Finland	Internalising and externalising symptoms were measured by parent report using the relevant sub-scales of the Behaviour Assessment for Children (BASC; Reynolds & Kamphaus, 1992)	**Individual-level:** Children's adaptability and social skills were measured by parent report using the relevant sub-scale of the BASC	Longitudinal design	Children with dyslexia, relative to those without dyslexia, were rated by parents as having poorer social skills and attentional difficulties but no link between dyslexia and internalising/externalising symptoms was found in this sample
Pih (1984) [74] Doctoral thesis	A comparison of normal and disabled readers in elementary school on intellectual, self-esteem, and anxiety factors	To investigate associations between reading, cognitive, and non-cognitive (anxiety/self-esteem) factors	The sample consisted of 40 children (aged 7-8, grade 2-3) identified as poor readers and 40 typically reading peers matched by age, gender, grade, race, and IQ	The groups were determined by children' scores on a standardised reading test (word reading and comprehension ability). Further testing of various aspects of reading were conducted to ascertain "reading level" which was treated as a correlational variable in the second part of the study	USA. The reading difficulties group were all accessing reading remediation classes	Children's anxiety was measured by self-report with the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978)	**Individual-level:** Children's self-esteem was measured by self-report with the Coopersmith Self-Esteem Inventory (SEI; Coopersmith, 1984)	Cross-sectional. ANOVA and correlational analysis	Typical readers, compared to those identified as poor readers, scored significantly higher on self-esteem but no group differences in anxiety were reported. There was a significant positive relationship between self-esteem and reading achievement in the typical reading group and a significant negative relationship between anxiety and reading achievement in the reading difficulties group

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Russell et al. (2015)[75]	Behavioural difficulties that co-occur with specific word reading difficulties: A UK population-based cohort study	To investigate the relationship between word-reading difficulties at age 7 and a range of social, emotional, and behavioural difficulties at age 11	Utilised the Millennium Cohort Study (MCS) data from 18519 participating families	13, 423 children were tested at age 7 for word reading ability with the British Ability Scales (BAS; Elliot et al., 1996). A reading difficulties group was formed based on performance 2 SD below chronological age norms	United Kingdom	Measured by teacher and parent report with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)	**Individual/Community-level**: children's pro-sociality and peer problems both measured by parents and teachers via the relevant sub-scales of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)	Longitudinal design. Tracked children from age 7 until 11 years	In this sample, word-reading difficulties were associated with (and appeared to precede) elevated levels of emotional difficulties, peer problems, conduct problems and hyperactivity/attentional difficulties measured by teacher and parent report
Sahin et al., (2018)[76]	The relationship of clinical symptoms with social cognition in children diagnosed with attention deficit hyperactivity disorder, specific learning disorder or autism spectrum disorder	To study Theory of Mind (ToM) among children with Specific Learning Disorder (SLD) in comparison to children with other neurodevelopmental differences and those considered typically developing	The sample consisted of children aged 7-12 years: 24 children diagnosed with Specific Learning Disorder (SLD); 24 with ADHD; 26 with autism; and 24 with no known neuro-developmental difference	Diagnoses conformed to DSM-5 criteria. Additionally, co-morbidities were exclusion criteria for group membership in this study	Turkey. The children with neurodevelopmental differences were recruited from a clinical context and the typically developing controls were all volunteer relatives of health workers.	Internalising/externalising symptoms were measured by parent and teacher report with the Aberrant Behaviour Checklist (ABC) (Aman et al., 1987) and the Turgay DSM-4 Disruptive Behaviour Disorders Rating Scale - Teacher form (Turgay, 1994)	**Individual-level**: The variable of interest to this review is children's social skills which were reported on by parents using the Social Responsiveness Scale (SRS) however the researchers also measured children's Theory of Mind (TOM) skills	Cross-sectional design	Children with neurodevelopmental disorders (including those with SLD) had deficits in theory of mind, relative to typically developing controls, independent of language skills and intelligence. Furthermore, the researchers found a significant correlation between poor social cognition skills and poorer social skills, learning, attention, and behaviour
Sainio et al. (2019)[77]	The role of learning difficulties in adolescents' academic emotions and academic achievement	To examine associations between learning difficulties, academic emotions, and academic achievement	The sample consisted of 845 grade 6 children (455 girls, 390 boys)	A reading difficulties group was determined by performance 1 standard deviation below the mean of the whole sample on standardised tests of: word	The study was part of a broader longitudinal study following a community sample of Finnish students across the transition from	Children reported on their academic emotions with the Finnish version of the Achievement Emotions Questionnaire (AEQ; Pekrun et al., 2011). The researchers focused on "hope" (e.g., "I have an optimistic view towards studying"), enjoyment (e.g., "I enjoy acquiring new knowledge"), and anxiety (e.g.,	**Individual-level**: Children self-reported on their overall academic achievement; literacy achievement (grade in literacy) and math achievement (grade in mathematics); and	Longitudinal. Data from the fall and spring of grade 6 was analysed. Gender, difficulty in other academic areas, and depression were controlled in the analysis.	The results of interest to this review are that students with reading difficulties reported lower hope and anxiety towards reading than those without reading difficulties. Furthermore, student's hope played a mediating role between learning difficulties and academic achievement (mathematics and literacy)

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				identification, decoding, and reading fluency	primary to secondary school.	"I get tense and nervous while studying")	attitude to their learning (hope and enjoyment – described under MH concept)		achievement. The researchers concluded that subject-specific academic emotions should be considered in regard to the academic achievement of students with learning difficulties
Singer (2005) [78]	The strategies adopted by Dutch children with dyslexia to maintain their self-esteem when teased at school	Through structured interviews with children the researcher aimed to explore their school experiences, specifically experiences of being teased, coping with teasing, and their psychological well-being (self-esteem and mental health)	The sample consisted of 60 Dutch children with dyslexia (aged 9-12 years) in mainstream class settings	All had been formally diagnosed with a primary diagnosis of dyslexia of at least one year duration, with at least average IQ and no other known psychopathology	Netherlands. The children were recruited via educational guidance services providing remedial support to children with learning difficulties. 91% of the sample were ported to be receiving extra remedial help from school and/or out of school service providers	The researcher explored children's psycho-social functioning broadly with a focus on self-esteem	**Individual-level**: Children's self-esteem, emotion regulation and coping strategies, and **Family/Community level**: perceptions of social support and peer difficulties/bullying were explored in this study	Mixed methods design. All children were invited to respond to fictitious scenarios involving the school experiences of children with dyslexia. After this, children were invited to discuss their own experiences, and 85% of the children did this via a semi-structured interview	The findings suggested that many children of this age feel embarrassed about their dyslexia and vulnerable to negative peer (self) comparisons. The author concluded that dyslexia directly affects children's self-esteem and makes them vulnerable to teasing. Further, that withdrawn or disruptive behaviour may be serving a protective function for children (in terms of addressing bullying); and that parents are the most important source of emotional and practical support
Singer (2007) [79]	Coping with academic failure, a study of Dutch children with dyslexia	A companion piece to the study above, in this study the researcher aimed to explore how children with dyslexia cope with repeated academic failure and how this relates to their self-esteem and mental health	9–12-year-old children (as above)	as above	Netherlands. as above	The researcher explored children's psycho-social functioning broadly with a focus on self-esteem	**Individual-level**: Children's self-esteem and coping strategies were explored and **Family/Community level**: perceptions of social support and peer difficulties/peer comparisons/bullying were explored in this study	Mixed methods design. All children were invited to respond to fictitious scenarios involving the school experiences of children with dyslexia. After this, children were invited to discuss their own experiences, and 56 children did so.	The researcher found that parent support was crucial for children's wellbeing. In contrast, peers were more likely perceived as threats to self-esteem. The protective function of adult role models (generally family members) was explored and the negative influence of bullying. Children were described as being motivated to protect their self-esteem and employed different approaches to do so such as: "1) working hard and committing to standards, 2)

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									lowering standards 3) seeking support from significant others (i.e parents and teachers), and, 4) avoiding comparisons with others (i.e. peers)" (p. 314)
Smart et al., (2019) [80]	Social mediators of relationships between childhood reading difficulties, behaviour problems, and secondary school non-completion	To examine whether key indicators of social connectedness mediate relationships between childhood reading difficulties/behavioural problems and secondary school non-completion	Four groups of children were formed by the researchers for this study: those with reading disorders (n = 38, 37% male); behavioural difficulties (n = 66, 58% male); both reading difficulties and behavioural difficulties (n = 38, 66% male); and neither reading difficulties or behavioural difficulties (n = 125, 35% male)	Children who performed in the lowest 16% on a standardised measure of word-reading were classified as those with reading difficulty	Australia. Data was drawn from the Australian Temperament Project an Australian longitudinal study that has followed a community sample of 2,443 children and their families from infancy to young adulthood	Internalising/Externalising symptoms were measured by parent and teacher report with the Rutter Child Behaviour Questionnaire (CBQ; Rutter, 1967; Rutter et al., 1970)	**Family/Community-level factors:** Children reported on their family and peer attachment with the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenburg, 1987) and both parents and children reported on various school factors such as: teacher attachment and approach to learning such as school engagement (including attendance, diligence), and school involvement (parent and child) with the ATP-devised School Problems Scale (SPS; Prior et al., 2000)	Longitudinal design. The analysis used data from the 6th (7-8 years), 9th (12-13 years), 10th (13-14 years), and 13th (19-20 years) time-points	The group with reading difficulties (without behavioural problems) reported more difficulty with understanding their schoolwork in the high school context, relative to children without reading/behavioural difficulties but were similar in terms of other measures. In contrast, children with behavioural problems (with and without co-occuring reading difficulties) reported significantly poorer family and school attachment/involvement
Snowling et al., (2007)[81]	Children at family risk of dyslexia: A follow-up in early adolescence	Using a longitudinal design, the researchers aimed to investigate a range of genetic and environmental risk factors for psycho-social outcomes	Fifty children with a family history of dyslexia and a control group of 20 without a family history of dyslexia were followed from infancy until	At time-point 4 (when the children were aged 12-13 years) 42% of children (11 boys and 10 girls) who had been previously classified as at family risk for	United Kingdom. This study represented the fourth phase of a longitudinal study which tracked British children at risk of literacy	Parents reported on children's internalising/externalising symptoms with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)	**Individual-level:** Children reported on their self-perception in three domains (social, academic, and physical competence) using Harter's Self-perception Profile for Children (Harter, 1985)	Mixed methods. Three groups (at risk "impaired"; at risk "unimpaired" and control group) were compared on the language, literacy, and SDQ factors	There was a significant positive association between literacy (reading and spelling) difficulties, attentional difficulties, and parental ratings of hyperactivity (but not conduct problems) and emotional difficulties, poor self-ratings of scholastic competence but not overall self-esteem or peer problems. There was also

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		among children identified in early childhood as being at risk of literacy difficulties	early adolescence (time-point 4). This study analysed the time-point 4 data	dyslexia were classified as having literacy difficulties based on reading and spelling attainment 1 standard deviation below the mean of the control group. This group (at risk impaired) were compared on a range of indicators to children who were at family risk for dyslexia but did not develop literacy difficulties (at risk unimpaired) and the original control group of children	difficulties from infancy		in addition to their print exposure using a questionnaire that tapped recognition of author names, book titles etc. Children were also assessed for spoken language skills. **Family/Community-level:** parents reported on children's peer problems with the relevant sub-scale of the SDQ. A parent interview gleaned information relating to a wide range of family (e.g., family stress and family literacy environment) and school (e.g., home-school liaison) factors	(externalising, internalising, peer problems), self-perception (scholastic, social acceptance and athletic), family environment and educational factors measured at time-point 4	evidence of a negative association between literacy difficulties and maternal well-being (higher levels of maternal stress and depression), family life, and parental worries about their child's progress at school even though most children were receiving support at school
Sorrenti (2019)[82]	The predicting role of school learned helplessness in internalizing and externalizing problems: An exploratory study in students with Specific Learning Disorder	To investigate learned helplessness as a predictor of the development of internalising/externalising difficulties in children with learning difficulties	The sample consisted of 84 children and adolescents (ranged from first grade to upper secondary school; Mage = 12.9 years, 52 males, 44 with learning difficulties and 40 without learning difficulties). The number of	All children in the learning difficulties group had an SLD diagnosis which conformed to DSM-5 criteria. Further, the researchers administered standardised tests in reading and writing to ensure that the SLD group met	All children were attending school in Messini, Italy	Internalising/externalising symptoms were measured by self and parent report with the relevant versions of the Child Behaviour CheckList (CBCL; Achenbach, 1991)	**Individual-level:** Children reported on their learned helplessness in school using the learned helplessness sub-scale of the Italian version of the Learned Helplessness Questionnaire (LHQ; Sorrenti et al., 2015). In this study learned helplessness referred to student's passiveness and lack	Cross-sectional	Children with learning difficulties, relative to those without learning difficulties, had higher levels of internalising symptoms. Furthermore, learned helplessness was a predictor of internalising and externalizing symptoms in children with, but not without, learning difficulties

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			children with dyslexia was not described	diagnostic criteria			of confidence regards academic tasks		
Speers (2019)[83] Doctoral thesis	An auto/biographical investigation exploring the life-stories of adults with dyslexia	To explore individual's experiences with dyslexia over the lifespan including in education and employment settings	Eight adults with a formal diagnosis of dyslexia including the researcher participated in the study	All participants self-identified as having dyslexia	United Kingdom	Childhood school behaviour in association with dyslexia were explored	**Individual-level**: Identity issues and the value of early diagnosis, self-esteem, shame (embarrassment), concealment and disclosure were explored by the participants. **Family-level**: the importance of parental support and understanding. **Community-level**: supportive learning environments, finding strengths	Qualitative design. Described as an autobiographical narrative inquiry. The researcher developed themes from the interview transcripts	Childhood externalising rather than internalising behaviour was highlighted. This behavior appeared to be especially related to the school context and dyslexia-related school difficulties such as being placed in "low" groups for learning and having difficulties with learning (leading to frustration). Early diagnosis and parental (especially maternal) support appeared to be protective of self-esteem. Participants described feeling ashamed of their learning difficulties and various coping strategies such as withdrawing and trying to conceal their differences at school and beyond
Stanley et al. (1997)[84]	Differences in depression and self-esteem reported by learning disabled and behavior disordered middle school students	To investigate self-reported group differences in self-esteem and depression among two at risk groups of students	Sixty-one middle school students (age and gender not provided but middle school students are typically adolescents) 33 classified as having learning disability and 28 as having behaviour disorder	The students had been classified as having a learning disability. The number with dyslexia was not specified	no context provided, believed to be USA	Depression measured by self-report with the Children's Depression Inventory (CDI; Kovacs, 1992)	**Individual-level**: self-esteem measured by children's self-report on the Coopersmith Self-esteem Inventory (CSEI; Coppersmith, 1990)	Cross-sectional	The levels of depression between the two groups (learning disabled vs behaviourally disordered) were similar. At t the "mildly depressed" level, the researcher felt the levels of depression were higher than what would be expected among children generally. Of interest to this review, the children with learning difficulties reported significantly lower levels of self-esteem than did those classified as having a behaviour disorder
Sukovieff & Kruk (2021) [85]	Reading difficulty and socio-emotional	To investigate the effect of "age of	Forty-five children (ages 9-12 years) with	Reading difficulties initially determined by	Winnepeg, Canada	Children reported on their internalising/externalising symptoms with the modified version of the	**Individual-level**: children's ability to cope with their	Cross-sectional. Mediational analysis using the	Early identified children (before grade 1) were more likely to report increased externalising and

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	adjustment: Internalizing patterns depend on age of identification	identification" on children's coping strategies and internalising/externalising symptoms	reading difficulties were recruited from schools and childcare centres	teacher/parent nomination and then confirmed through scores on standardised tests of word-reading administered by the researchers		Self-Description Questionnaire (SDQ; Marsh, 1990) used by other studies using the Early Childhood Longitudinal Study; this scale has six items relating to externalising symptoms and eight items relating to internalising symptoms	reading difficulties was measured by self-report using an adaptation of the Response to Stress Questionnaire-School version (RSQ; Connor-Smith et al., 2000) - items were adapted to refer to school/reading related stress. Additionally, the age of identification of the child's reading difficulties was reported by an item on the parent survey and coded dichotomously as early (poor reading identified ≤ 6 years) and late identified (reading difficulties identified between 7-12 years)	PROCESS macro (Hayes, 2018).	internalising symptoms relative to those classified as being identified later. Furthermore, the way children reported coping with their reading difficulties did not appear to influence the association between age of identification and mental health outcomes
Terras et al., (2009) [86]	Dyslexia and psycho-social functioning: An exploratory study of the role of self-esteem and understanding	To investigate the nature of the relationship between self-esteem, mental health, and family factors (i.e., understanding dyslexia and the parent-child relationship)	A convenience sample of 68 children and adolescents with dyslexia (age range = 7.67–16.58 years, Mage = 11.2 years, 44 male) and their parents were recruited through a dyslexia service/advocacy	All children had been assessed as having dyslexia by an educational psychologist using the IQ-reading ability discrepancy approach	United Kingdom. All families were members of "Dyslexia Action" in Scotland. High percentage of parents (52%) were in professional/managerial occupations	Children's socio-emotional difficulties were measured by parent report with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). A sub-sample of 35 children completed the child version of the SDQ	**Individual-level**: Children's self-esteem was measured by child and parent report with Harter's Self-profile for Children (SPCC; Harter, 1985) and survey items measured self-understanding of dyslexia. **Family-level**: Parent understanding of dyslexia and parent/child relationship quality	Mixed methods design. Cross sectional data was analysed by Pearson correlations and compared to population norms	Dyslexia was associated with socio-emotional difficulties. Low self-esteem positively correlated with socio-emotional difficulties in this sample. Further, there was a positive association between poor academic self-esteem and SDQ "emotional difficulties". Children's socio-emotional wellbeing was associated with having more positive attitudes to dyslexia (both parents and children) and more positive peer and parent relationships

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			group in Scotland				was measured by survey items of the researcher's own design. **Community-level:** Peer problems were measured by parents using the peer problem subscale of the SDQ		
Thomson et al. (1990)[87]	Behavior problems in children with the presenting problem of poor school performance	Compared behavioural difficulties among a variety of children with low school performance	A total sample of 79 children and adolescents (70% males, aged 6-15 years) divided into a learning disabled group; a group with low IQ; a group with borderline IQ; and a control group with normal IQ and no learning difficulties	Thirty-four children met criteria for learning disability based on IQ-discrepancy and performance in the lowest 20% of children on standardised tests of reading, writing or mathematics. The number of children with dyslexia was not reported	USA. All children were experiencing low school performance	Internalising/externalising symptoms were assessed by parent report using a combined checklist based on items from two standardised measures (one being the Child Behaaviour CheckList (Achenbach & Edelbrock, 1983) and the other being the Missouri Children's Behaviour Checklist (MCBC; Sines, Pauker, Sines, & Owen, 1969) which contains six subscales which purport to measure aggression, inhibition, activity level, sleep disturbance, somatization, and sociability	**Individual-level:** Children reported on their self-esteem using Harter's Perceived Competency Scale for Children (Harter, 1982) which includes sub-scales that relate to cognitive, social and physical self-worth.. Parents reported on children's sociability with the MCBC. **Family-level:** family functioning was measured by parent-report with the Family Relationship Index (FRI; Holahan & Moos, 1981) a measure of family cohesion, expressiveness and conflict	Cross-sectional. ANOVA and MANOVA were used to analyse the data	The MCBC sociability factor did not relate to internalising/externalising symptoms in this study. Nevertheless, across subgroups, more behavioural difficulties were associated with lower self-worth and family functioning described as being more controlling and less supportive. Further, internalising symptoms were negatively related to lower levels of social self-worth
Tistan (1993)[88] Doctoral thesis	Learning disabilities and depression in children: The development of self-concept	To investigate the association between learning disabilities depression, self-esteem, and	The sample consisted of 90, 8-11 year old children (60 with learning difficulties and 30	The children with learning difficulties were recruited from special education classes within	Described by the researcher as a middle-class suburban community with minimal ethnic diversity.	Children's symptoms of depression were measured by self-report with the Children's Depression Inventory (Kovacs, 1983)	**Individual-level:** children's self-concept was measured by self-report with the Piers-Harris Self-Concept Scale (Harris, 1969) and their	Cross-sectional. Described by the researcher as a quasi-experimental group comparison design	Children with learning difficulties, compared to those without learning difficulties, reported more depression in this study. Furthermore, poor self-concept and poor reading comprehension were associated with more

Author (Date)	Title	Aim of study	Population	Learning/Reading Difficulties	Context	Mental Health Concept	Third factor of interest	Methodology	Key findings
	and achievement	school achievement	without learning difficulties)	mainstream school settings and had learning difficulties confirmed through psycho-educational assessment	New Jersey, USA		reading achievement (as a measure of school achievement) was measured by the Woodcock Reading Mastery Tests – Revised (Woodcock, 1987)		depression among children with learning difficulties. The researcher suggested that the findings support a view that that learning difficulties in combination with depression may be associated with poor self-concept rather than learning disabilities alone
Törő et al., (2018)[89]	Reading disability spectrum: Early and late recognition, sub-threshold, and full comorbidity	To investigate the comorbidity of reading difficulties with sub-threshold and full psychiatric disorders and the influence of age of reading difficulties recognition on this relationship	130 children and adolescents (7-18 years) classified as those with reading difficulties (n = 48, Mage = 10.23 years, 40% girls) and those without reading difficulties (n = 82, Mage=9.66 years, 39% girls)	A Hungarian adaptation of the Dyslexia Differential diagnosis Maastricht-Hungarian Standard Test (3DM-H; Toth et al., 2014) was used to verify group membership	Children were recruited through the Department of Children and Family Services, Vecses City Local Government, Hungary.	The Mini International Neuropsychiatric Interview Kid, a diagnostic interview which assesses for 25 child psychiatric disorders related to the DSM-Fourth edition (APA, 1994) was used. This produces a total externalising and total internalising score per participant. Children < 13 years were interviewed with a parent and children ≥ 13 years were interviewed alone	**Individual-level**: Age of recognition of reading difficulties were investigated in association with the severity of reading difficulties and mental health concerns	Cross-sectional data	Higher levels of internalising and externalising disorders were more prevalent in the group with, relative to those without, reading difficulties, regardless of reading difficulty severity. When considering both sub-threshold and full psychiatric diagnoses together, externalising symptoms and mood disorders were more prevalent among children whose reding difficulties were recognized late, rather than early in their life
Tsovili (2004)[90]	The relationship between language teachers' attitudes and the state-trait anxiety of adolescents with dyslexia	To investigate anxiety among adolescents with dyslexia and the role of teacher attitudes	68 adolescents with dyslexia (52 male; Mage = 15 years) and their language teachers (31 males) selected at random from a hospital outpatient service and a specialist dyslexia centre	All child participants had been previously diagnosed with dyslexia by a multi-disciplinary team within a hospital setting	Greater Athens area, Greece	The adolescent's state-trait anxiety was measured by a Greek adaptation of the State-Trait Anxiety Inventory for Children (Psychountaki, 1995; Spielberger et al., 1973). The state anxiety component of the measure was adapted by the researchers to measure reading-related anxiety	**Individual-level**: through interviews the researcher explored students' attitudes to learning and ways of coping with difficulties. **Community-level**: Teachers completed a questionnaire of the researchers own making (called the Teacher Questionnaire) which purported to measure student-teacher relationship and	Mixed methods design. Group differences on variables of interest were first computed followed by correlational and regression analysis. The adolescents with the lowest and highest levels of reading anxiety (5% of research group at both ends = 9	Adolescents with dyslexia reported higher reading anxiety but lower levels of trait anxiety than those without reading difficulties. During the interviews, problem-focused coping styles and teacher understanding were identified as protective whereas "learned helplessness" was described as contributing to risk for reading anxiety

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							teaching style/behaviour/attitude	participants) were then interviewed	
Turunen et al. (2019)[91]	Word reading skills and externalizing and internalizing problems from grade 1 to grade 2 - Developmental trajectories and bullying involvement in grade 3	To investigate associations between word-reading skills and internalising/externalising behaviour, on bullying involvement over time	A sample of 480 Finnish children (Mage = 7 years 2 months at start of study) were tracked from kindigarten to year 3	Groups of below average and skilled readers were formed based on performance on word-reading tests administered at all time-points during the study	Finland	Externalising and internalising symptoms were evaluated by teachers at all three time-points using the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)	**Community-level:** Grade 3 children reported on their bullying involvement (with sub-scales measuring: bullies /victims/ and bully-victims) with the Olweus Bully/Victim Questionnaire (Olweus, 1996).	Longitudinal design	The researchers concluded that the findings suggest that reading difficulties alone do not increase the risk of bullying involvement but add cumulative risk, alongside internalising/externalising symptoms, to children being bullying perpetrators or bully-victims
Undheim et al. (2008)[92]	Psychosocial factors and reading difficulties: Students with reading difficulties drawn from a representative population sample	To investigate a variety of psycho-social variables in a community-based sample of adolescents with and without reading difficulties.	A sample of 2,464 Norwegian adolescents (12-15 years, 50.8% girls) participated. The sample contained a subsample with reading difficulties (n = 199)	Determined by two self-report items: "Have you had specific reading and writing problems (dyslexia) in the last 12 months?" and are the amount of reading problems "large problems" "some problems" or "no problems"	Norway	Depression was measured by self-report with the Mood and Feelings Questionnaire (MFQ; Angold, 1989)	**Individual-level:** Children reported on their self-esteem with the Self-Perception Profile for Adolescents (SPPA; Harter, 1988, Wichstrom, 1995); their levels of school stress with the Early Adolescent Stress Questionnaire (EASQ; Sund et al., 2003) **Family and Community-level:** Children reported on their attachment to parents and peers with the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987)	Cross-sectional. A series of regressions was conducted to examine differences between the two groups (with and without reading difficulties) on the psycho-social variables	Adolescents with reading difficulties, compared to those without reading difficulties, reported lower attachment to parents (but not peers), lower global self-worth as well as higher rates of depression, school stress, and worry about going to school. Adolescents' self-esteem did not moderate the association between school stress and reading difficulties in this sample

Author (Date)	Title	Aim of study	Population	Learning/Reading Difficulties	Context	Mental Health Concept	Third factor of interest	Methodology	Key findings
Undheim et al. (2011)[93]	Emotional and behavioral problems among school adolescents with and without reading difficulties as measured by the Youth Self-Report: A one-year follow up study	To investigate the association between reading difficulties and emotional/behavioural difficulties across time	A sample of 191 Norwegian adolescents, 12-15 years, 7.8% with reading difficulties	Based on adolescent's self-report of reading difficulties at Time-point 1	Norway	Internalising/externalising symptoms measured by self-report with the Norwegian version of the Youth Self Report - Child Behaviour CheckList (YSR-CBCL; Achenbach, 1991)	**Community-level**: Adolescent's social difficulties/experiences was measured by self-report with the 8-item social problems sub-scale of the YSR-CBCL	Longitudinal design.	Reading difficulties were associated with higher self-reported internalising symptoms, externalising symptoms, and social difficulties. Furthermore, reading difficulties predicted high levels of social difficulties prospectively irrespective of educational placement
Valenti (1986)[94] Doctoral thesis	Manifest aggression, state/trait anxiety, locus of control, perceived parental attention, and reading level among learning disabled adolescent males	To investigate family and personality factors in association with anxiety and aggression among adolescent males with reading/learning difficulties	49 adolescents (aged 12-18 years, all male)	All had met an IQ-discrepancy diagnostic criteria for learning disability. Reading level was also assessed by the researcher by a standardised reading test	Boston, USA. The boys were recruited from specialist schools for children with learning difficulties	Aggression (externalising) and State/Trait anxiety (internalising) were measured by child self-report with the Manifest Aggression Scale (Jesness, 1966) and The State-Trait Manifest Anxiety Scale (version not described)	**Individual-level**: Children reported on their locus of control with the Locus of Control Scale (LOC; Nowicki-Strickland, 1973). **Family-level**: child-parent relationship from the perspective of the child was also assessed	Cross-sectional. Stepwise multiple regression with manifest aggression as the outcome variable	Higher levels of state and trait anxiety were associated with manifest aggression and less internally focused locus of control. An association between children's aggression and poor child-father relationship was also reported
Willcutt et al. (2007)[95]	Longitudinal study of reading disability and attention-deficit/hyperactivity disorder: Implications for education	To investigate the long term academic and psycho-social outcomes of children with reading difficulties (RD) (with and without ADHD)	A sample of children (and their parents) with RD only (n= 71), co-morbid RD/ADHD (n= 51) and ADHD only (n=66) or neither disorder (n=118) Age at initial testing approx. 10-11 years and at the five-year	RD determined by the researchers based on scores on standardised tests of word reading	USA. The children were recruited from an existing 5-year longitudinal twin study	The researchers developed a separate anxiety, depression and externalising symptoms composite score per child based on clinical interview (parents) and scores on standardised self-report measures such as the Children's Depression Inventory (Kovacs, 1988); the Youth Self-report of the Child Behaviour CheckList (CBCL; Achenbach & Rescorla, 2001); and the Children's Manifest Anxiety Scale; Reynolds & Richmond, 1978)	**Individual-level**: academic performance, measured by a composite score combining grade point averages and CBCL parent and self-ratings. **Community-level**: parents and children reported on their social functioning/social difficulties with survey items and the CBCL and YSR-	Longitudinal design. Regression analysis	Reading difficulties were associated with more academic difficulties, depression and adolescent-onset conduct disorder. Co-morbidity of reading difficulties with ADHD increased risk for academic difficulties and social difficulties

Author (Date)	Title	Aim of study	Population	Learning/Reading Difficulties	Context	Mental Health Concept	Third factor of interest	Methodology	Key findings
			follow-up approximately 15-16.3 years				CBCL social problems sub-scale. The survey also contained items to measure children's involvement in extra-curricular activities as an indicator of social engagement		
Willcutt et al. (2013)[96]	Co-morbidity between reading disability and math disability: Concurrent psychopathology, functional impairment, and neuropsychological functioning	To better understand the aetiology of the co-morbidity of mathematics and reading disability	The sample consisted of children and adolescents aged 8-15 years: a group with reading disability (RD group n = 241); Mathematics disability (MD group, n = 183); co-morbid RD and MD (n = 188) and a control group with no known learning disability (n = 411)	RD was defined by a cut-off score 1.25 standard deviations below the estimated population mean (approximately 10th percentile) on an age-adjusted measure of word reading ability derived from the Peabody Individual Achievement Test (PIAT)	USA. The participants were recruited from an existing longitudinal twin study.	Symptoms of internalising/externalising disorders were measured by parent report with the Diagnostic Interview for Children and Adolescents (Reich, Wellner &Herjanic, 1997) and by parent and teacher report with the relevant versions of the Child Behaviour CheckList (CBCL; Achenbach & Rescorla, 1991); and the Disruptive Behaviour Rating Scale (DBRS; Barkley & Murphy, 1998)	**Individual-level:** The child survey measured children's perceptions of their academic achievement. Parents reported on their child's global functioning with the Child Global Assessment Scale (Setterber et al., 1992); and parents and teachers reported on children's academic functioning with the relevant section of the DBRS. **Community-level:** Children were asked about the extent to which they liked school and children's social problems were reported on by parents and teachers with the CBCL social problems sub-scale; a rating of peer-liking from teacher's	Cross-sectional. Group comparison design	Higher levels of externalising symptoms appeared to be explained by ADHD in this sample, whereas reading difficulties were associated with higher levels of internalising symptoms (depression and generalized anxiety). Co-morbidity appeared to increase risk for social isolation, peer difficulties and poor academic functioning

Author (Date)	Title	Aim of study	Population	Learning/Reading Difficulties	Context	Mental Health Concept	Third factor of interest	Methodology	Key findings
							perspectives; and the Social Isolation scale from the Colorado Learning Difficulties Questionnaire (CLCQ; Willcutt et al., 2011)		
Zach et al. (2016)[97]	Academic achievements, behavioral problems, and loneliness as predictors of social skills among students with and without learning disorders	To investigate whether academic achievement, learning difficulties, behaviour problems, and loneliness explain variance in students' social skills	Participants were 733 children and adolescents (6-13 years, 359 boys and 374 girls, 91 with learning difficulties (46 boys, 45 girls), 642 without learning difficulties	All in the LD group had a previous diagnosis based on DSM-4 criteria, sub-type of LD was not described	Israel. Children were all in mainstream school settings	Children's "behaviour problems" were assessed by teacher report with the problem behaviour sub-scale of the Social Skills Rating System (SSRS; Gresham & Elliot, 1990). This sub-scale measures internalising/externalising symptoms and hyperactivity	**Individual-level:** Teachers reported on children's social skills and academic competence with the relevant sub-scales of the SSRT. **Community-level**: Children self-reported on their loneliness with Asher and Wheeler's adapted version of their 24-item self-report measure (Asher, Hymel, and Renshaw, 1984).	Cross-sectional. Regression analysis	LD status did not explain variance in social skills, but academic achievement and behaviour problems did. Loneliness explained social skills variance amongst boys only. This finding suggests an association between social skills and internalising/externalising symptoms
Zuppardo et al., (2021)[98]	More than words: Anxiety, self-esteem and behavioral problems in children and adolescents with dyslexia	To define clinical psycho-affective and behavioural profiles of dyslexia	Children and adolescents (aged 8-18 years) participated including those with dyslexia and a control group without any known learning difficulty	Children and adolescents in the dyslexia group met DSM-5 diagnostic criteria	Italy. All participants were native Italian speakers and recruited with the assistance of a Pediatric Neuropsychiatry service	Children's anxiety was measured by self-report with the Multi-dimensional Anxiety Scale for Children (MASC; March et al., 1997) and by parent report with the Child Behaviour Checklist (CBCL; Achenbach, 1991)	**Individual-level**: children's self-esteem was measured by self-report with Bracken's Multi-dimensional Self-esteem Assessment Test (TMA; Bracken, 1993)	Cross-sectional. A MANCOVA was conducted to compare the groups on the psychosocial variables. A separate analysis looked at group differences related to age (children vs adolescents)	Children and adolescents with dyslexia had lower levels of self-esteem in academic and social situations, higher levels of anxiety and more behavioural problems than their peers without learning difficulties. Compared to adolescents with dyslexia, children with dyslexia appeared to experience more social anxiety, separation anxiety and behavioural problems

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Appendix F

Chapter 3 and Chapter 4 Ethical Approval

Curtin University

Research Office at Curtin

GPO Box U1987
Perth Western Australia 6845

Telephone +61 8 9266 7863
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Web research.curtin.edu.au

25-Feb-2021

Name: Mark Boyes
Department/School: School of Psychology
Email: Mark.Boyes@curtin.edu.au

Dear Mark Boyes

RE: Ethics Office approval
Approval number: HRE2021-0084

Thank you for submitting your application to the Human Research Ethics Office for the project **Growing up with reading difficulties: Child and parent perspectives**.

Your application was reviewed through the Curtin University Low risk review process.

The review outcome is: **Approved**.

Your proposal meets the requirements described in the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research (2007).*

Approval is granted for a period of one year from **25-Feb-2021** to **24-Feb-2022**. Continuation of approval will be granted on an annual basis following submission of an annual report.

Personnel authorised to work on this project:

Name	Role
Boyes, Mark	CI
Leitao, Suze	Supervisor
Hasking, Penelope	Supervisor
Wilmot, Adrienne	Student

Approved documents:

Document

Standard conditions of approval

1. Research must be conducted according to the approved proposal
2. Report in a timely manner anything that might warrant review of ethical approval of the project including:
   - proposed changes to the approved proposal or conduct of the study
   - unanticipated problems that might affect continued ethical acceptability of the project
   - major deviations from the approved proposal and/or regulatory guidelines
   - serious adverse events
3. Amendments to the proposal must be approved by the Human Research Ethics Office before they are implemented (except where an

amendment is undertaken to eliminate an immediate risk to participants)
4. An annual progress report must be submitted to the Human Research Ethics Office on or before the anniversary of approval and a completion report submitted on completion of the project
5. Personnel working on this project must be adequately qualified by education, training and experience for their role, or supervised
6. Personnel must disclose any actual or potential conflicts of interest, including any financial or other interest or affiliation, that bears on this project
7. Changes to personnel working on this project must be reported to the Human Research Ethics Office
8. Data and primary materials must be retained and stored in accordance with the Western Australian University Sector Disposal Authority (WAUSDA) and the Curtin University Research Data and Primary Materials policy
9. Where practicable, results of the research should be made available to the research participants in a timely and clear manner
10. Unless prohibited by contractual obligations, results of the research should be disseminated in a manner that will allow public scrutiny; the Human Research Ethics Office must be informed of any constraints on publication
11. Approval is dependent upon ongoing compliance of the research with the Australian Code for the Responsible Conduct of Research, the National Statement on Ethical Conduct in Human Research, applicable legal requirements, and with Curtin University policies, procedures and governance requirements
12. The Human Research Ethics Office may conduct audits on a portion of approved projects.

Special Conditions of Approval

It is the responsibility of the Chief Investigator to ensure that any activity undertaken under this project adheres to the latest available advice from the Government or the University regarding COVID-19.

This letter constitutes low risk/negligible risk approval only. This project may not proceed until you have met all of the Curtin University research governance requirements.

Should you have any queries regarding consideration of your project, please contact the Ethics Support Officer for your faculty or the Ethics Office at hrec@curtin.edu.au or on 9266 2784.

Yours sincerely

Amy Bowater
Ethics, Team Lead

Appendix G

Chapter 3 and Chapter 4 Child Information Sheet and Consent Form

1

Curtin University

School of Population Health
April 2021

<u>**Young person's information sheet**</u>

Growing up with reading difficulties: Child and parent perspectives

Hello,
We are a team of researchers from Curtin University who are working on a project that aims to better understand what it's like to grow up with reading difficulties. This information will help us to 1) improve community understanding about reading difficulties, and 2) design even better support services for young people with reading difficulties and their families.

Can I be involved?
If you have a diagnosed reading difficulty and are aged between 10 and 13 years old, then you can take part in this study.

Do I have to take part?
You don't have to take part in this study if you don't want to and you can change your mind and that's OK. You just need to let your parent/carer know and they will tell us.

What would I have to do?
One of us will come and talk to you for about 30 minutes at your home or in a quiet and private room at Curtin University if you prefer. We will ask you questions about your experiences with reading difficulties and how you think and feel about your reading difficulties. We will also be talking to your parent/carer in a separate interview to get their point of view. As a thank you, we will give you a $15 gift voucher at the end of the interview.

What if I don't want to answer a question?
You don't have to answer any question that you don't want to. You can skip a question, take a break, or stop the interview at any stage.

Is what I say private?
Everything you say in your interview is private. The only time we will talk to someone else about what you say is if you tell us that you are having lots of problems with how you think or feel. Then, we will have a chat with your parent/carer about ways to help you.

What will happen to the information that I give you?
We will audio-record your interview and then type it up. Your name won't be on the written summary so no-one will know that you were part of the study unless you tell them. A copy of your interview will be stored in a safe place at Curtin University until you are 25 years old. The information from your interview will be put with all the other interviews to make a summary. When we have finished all the interviews we will send you a short summary of the findings and invite you to give us feedback.

How do I become involved?
Please discuss the study with your parent/carer. If you or your parent/carer have any questions please contact Adrienne on: adrienne.wilmot@postgrad.curtin.edu.au or, phone 0478 251 132.

When you feel sure, please ask your parent/carer to let Adrienne know that you want to be involved in the study. You will then need to sign and return the consent form to us when we meet you for your interview.

Thank you for your interest in this study. We look forward to meeting you.

Adrienne Wilmot
PhD student
School of Population Health

A/Professor Suze Leitão
School of Allied Health

Hannah Pizzey
Psychology Honours student
School of Population Health

Associate Professor Mark Boyes
School of Population Health

Professor Penelope Hasking
School of Population Health

Curtin University

**School of Population Health
April 2021**

Growing up with reading difficulties: Child and parent perspectives

<u>**Child/Adolescent Consent form**</u>

☐   I have read and understand the information letter.

☐   I have talked to my parent/carer about the study.

☐   I want to take part in this study.

☐   I know that I can skip a question or stop the interview if I want to.

☐   I know that everything I say is private unless my parent/carer needs to be told that I am having lots of problems with how I think or feel.

☐   I know that my interview will be audio-recorded.

My name: _____

My signature: _____

Today's date (DD/MM/YYYY): _____ / _____ / _____

For your parent/carer

I have discussed the information above with my child and give permission for my child to participate.

My name: _____

My signature: _____

Today's date   /   /

Appendix H

Chapter 3 and 4 Caregiver Information Sheet and Consent Form

Curtin University

School of Population Health

April 2021

<u>**Parent/carer information sheet**</u>

Growing up with reading difficulties: Child and parent perspectives

What is this study about?
Approximately 2-4 children in every Australian classroom experience significant and persistent difficulties learning to read. Many children with reading difficulties are resilient and have good self-esteem, however, some experience poor mental health such as anxiety and depression. The aim of our research is to learn more about risk and protective factors for mental health among children with reading difficulties.

Who can participate in this study?
If you are the parent/carer of a child (aged 10-13 years) who has a diagnosed reading difficulty, then you are invited to participate. Your child does not need to have experienced mental health issues for you to take part. With your consent, we would also like to interview your child in a separate interview.

What are the benefits of being involved in this study?
There are no immediate benefits of being involved in this study. However, the information that you and other families provide will help us better understand mental health issues for children with reading difficulties and inform future mental health programmes for children who need this kind of support.

Who is conducting the research?
The parent interviews will be conducted by Adrienne Wilmot as part of her PhD studies. Adrienne is being supervised by Associate Professor Mark Boyes, Professor Penelope Hasking, and Associate Professor Suze Leitão, who are all from Curtin University and part of the research team. The child interviews will be conducted by Hannah Pizzey, a psychology honours student, who is being supervised by Associate Professor Mark Boyes and Professor Penelope Hasking.

What does participation involve?
Your participation involves an informal interview of approximately 30-45 minutes including a short survey. You will be asked questions about your child's experiences growing up with reading difficulties, how your child's reading difficulties affect you and your family, the ways you support your child, and your thoughts/experiences about your child's transition from primary to secondary school. You can choose to be interviewed in your own home or in a private space at Curtin University. With your permission, your interview and your child's interview will be audio-recorded. After we have looked at all the interview transcripts, we will make a short summary of the main themes and send this to you and your child for feedback. As a thank you, you and your child will receive a $15 gift voucher at the end of the interview.

Can I withdraw from the study?
Participation in the study is voluntary. You can withdraw yourself, or your child, from the study without consequence. However, once the data have been analysed, we will not be able to find and remove any individual's data.

Are there any risks to participating in this study?
Although unlikely, it is possible that you may experience some discomfort when reflecting on your child's experiences with their reading difficulties. For this or any other reason, you can take a break, skip a question, or stop the interview. During the child interviews we ask parents/carers stay close by so that they are available if their child needs assistance. If necessary, for COVID-19 safety, interviews can be conducted by conference call.

What happens to my information and how is my privacy protected?
Your name, and your child's name, will be replaced with a pseudonym on the written transcripts of interviews. Audio-recordings of interviews will be deleted when we have finished transcribing them. The de-identified written transcripts will be saved in a secure and password protected folder on the Curtin University hard drive. All hard copies of materials, such as consent forms, will be stored in a locked filing cabinet in the School of Population Health at Curtin University. Your information will be stored for 7 years and then disposed of in accordance with The West Australian University Sector Disposal Authority.

Where will the results be published?
The findings of this study will be reported in a PhD thesis and in a research summary. We also aim to present the findings at conferences and publish them in professional and academic journals. No information that identifies you or your child will be used in any of these presentations/publications.

Where can I get more information?
For more information or to get involved contact Adrienne Wilmot on 0478 251 132 or adrienne.wilmot@postgrad.curtin.edu.au.

Thank you for your interest in this study. We look forward to meeting you.

Adrienne Wilmot, PhD student and
Hannah Pizzey, Psychology Honours
student
School of Population Health

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Curtin University

School of Population Health
April 2021

Growing up with reading difficulties: Child and parent perspectives

PARENT/CARER CONSENT FOR INTERVIEW

Thank you for your interest in this study. Please read and sign this consent form to indicate that you understand and agree to the following statements:

1. I understand what participation in this research involves.
2. I have had my questions about the research answered satisfactorily.
3. I have read and understood the participant information sheet.
4. I understand that my involvement, and my child's involvement, in the study is voluntary and that we can skip questions or stop the interview at any stage.
5. I understand the risks and benefits of involvement in this study.
6. I understand that I may withdraw from the study or withdraw my child from the study without consequence at any time prior to the final checking.
7. I understand that all information provided by myself and my child is treated confidentially.
8. I give consent for the researcher to make an audio-recording of the interview.
9. I give permission for the contribution that I and my child make to this research to be used in conference talks and published in reports and articles provided that my child or myself are not identified in any way.

My name: _____

My signature: _____ Today's date   /   /

Appendix I

Chapter 3 and Chapter 4 Semi-structured child interview protocol

Step 1:

- Check consent forms
- Introduce myself
- Reiterate voluntary nature of participation, confidentiality (and limits to confidentiality), right to withdraw/take breaks/skip a question
- Discuss taking notes and recording the interview
- Talk about member checking
- Ask if they have any questions about the process

Information and consent

(example preamble below)

"Thank you so much for agreeing to talk to me today. I'm at University doing a study which is trying to find out what it's like for kids who have reading difficulties. This is so we can find out ways to better support kids who have difficulty with reading. I'm talking to lots of parents and kids about their reading difficulties. When I spoke to your mum/dad they told me that you have some difficulties with your reading, so thanks so much for talking to me today.

This chat will take about 30 mins. Remember that everything you say to me is private. I will be recording our talk – but this is just so that when I'm with you I can focus on what you are saying. I will write up what you said later but remember that your answers will go into my report with answers from all the other kids and parents that I talk to and it won't have your name on it. So, no-one will know what was your bit and what was someone else's bit. If you do tell me that you are having a really tricky time with your thoughts and feelings I will talk to mum and dad about that – so that we can work out how best to help you.

Now, we are going to get started soon, but if you want to stop or take a break when we are talking just let me know. You can tell me with one of these signs if that helps (show the child the visual aids). So, there is a sheet here for you to sign. Have you seen it? We'll read through it together now and you can ask me questions before you sign it. Is there anything you'd like to check with me before we start?

Step 2: After written consent is taken from child and parent. Start recording and title interview, i.e., interviewer name, date, time, participant # (only refer to interviewee by first name)

Step 3: Icebreaker

Example Icebreaker:

Tell me what kind of things you like to do? (If participant does not know what to say the researcher can provide an example, "I would describe myself as someone who likes spending time with close friends and family, caring for my pets, reading, and watching movies".

Step 4: Questions

Question set 1. Emotions, coping and support.

A. Now, tell me a little bit about what it is like to have reading difficulties?

Prompt for experiences, emotions, and coping.

Example prompts:

- *Experience - e.g., You mentioned feeling (e.g., stressed) – can you tell me a story about when you felt that way? Or tell me about a time when that happened to you? Can you tell me about a happy time at school? Can you tell me about a really tricky time at school?*
- *Coping – e.g., Are there any things that you do to make yourself feel better when things like that happen?*
- *Feelings and emotions – e.g., That must make you feel really (X) what do you do when you feel that way?*
- *OK – so we've talked a lot about your experiences and how you cope and how you feel. Is there anything else you'd like to tell me about those?*

Question set 2. Support

The next thing I'm interested in is something called support. So, by support I mean things that other people do or say to help you feel better.

Or, if working with a child that may not understand the word support. Can you tell me a little bit about the things that other people do or say that help you to feel better?

Can you tell me a story about a time that someone helped you feel better? What did they do? What did they say? Prompt: It sounds like (X person) is really supportive, Is there someone else that is supportive for you, can you tell me about a time when they were supportive for you?

Wrap up – You've told me so much about the people that support you that is really helpful for my study – thank you.

Question set 3: Transition

OK, now we've reached the last section of our talk today.What grade are you in now? Do you know what secondary school you are going to?

A.   How are you feeling about moving to secondary school? Or (if they have already transitioned to secondary school)

Recently you moved from primary to secondary school –tell me how that went for you?

Prompt: What were some good things about the change? What were some not so good things about the change? How did you cope with the change? Was there something or someone that really helped you?

Question set 4. Finishing questions

A.   So, we've talked a lot about your experiences with reading difficulties, your feelings, and support – is there anything I've missed, anything that you think I should know about?

Prompt: If you could change things, if you could make things different for kids with reading difficulties, what would you do?

Step 4. Concluding the interview and member checking

Thank you so much for your time. I've learned so much about reading difficulties from talking to you. Do you have any questions for me before we finish up? When I've finished all my interviews, I will send you and your parent a short summary of the main findings. At this point, you can give me some feedback or add things that you think are important and have been missed out.

Appendix J

Chapter 3 and Chapter 4 Semi-structured caregiver interview protocol

Step 1:

- Check consent forms
- Introduce myself
- Reiterate voluntary nature of participation, confidentiality, right to withdraw/take breaks/skip a question
- Discuss taking notes and recording the interview
- Talk about member checking
- Ask if they have any questions about the process

Example Preamble (covering the above-mentioned points)

"Thank you so much for agreeing to talk to me today. My name is Adrienne and I am a PhD student in the School of Population Health at Curtin University. I am working with a team of researchers who are trying to understand how we can better support the mental health of children with reading difficulties. I aim to speak to approximately 15 parents and their children about their experiences with reading difficulties. Even if your child has not experienced mental health difficulties we are still interested to hear about your experiences. This will help us understand what factors may be protective of mental health for children with reading difficulties. Have you read through the information sheet and consent form – do you have any questions about that?

I will be recording the interview and taking notes whilst we are speaking so that I can remember your comments– is that OK? Everything you say to me today is confidential and you don't have to answer a question if you prefer not to. Please also let me know if at any point you feel uncomfortable and would prefer to stop or take a break. These questions are just a guide - if there is anything else you'd like to tell me about reading difficulties I would love to hear it."

Step 2: Start recording and title interview, i.e., interviewer name, date, time, participant # (only refer to interviewee by first name)

Step 3. Interview.

Question set 1. Parent/Carer experiences:

A.   Can you tell me a little bit about what it's like to have a child with reading difficulties?

Question set 2. Parent/Carer perspectives on their child's experience:

A.   Can you tell me how you think your child's reading difficulties affect them?

Prompt – for emotions and mental health: You mentioned (X) can you tell me how that makes your child feel?

B.   How do you think your child manages these emotions?

Prompt: What does your child do when they feel that way?

C.   How do you think your child's reading difficulties affect those around them?

Question set 3. Support

A.   Can you tell me a little bit about the ways that you support your child?

Prompt – if practical ways, prompt for emotions. You've mentioned that your child often feels (e.g., sad) can you tell me how you support your child when they feel that way?

B.   Is there anything else you'd like to tell me about the ways your child is supported?

Question set 4. Parental mental health and wellbeing

A.   Can you tell me how your child's reading difficulties affect you and your family? How do you cope with this?

Question set 5. Transition.

A.   Can you tell me how you and your child are feeling about the transition to secondary school? Or, if the child has already transitioned to secondary school: Can you tell me how the transition from primary to secondary school went for your child?

Prompt: What things helped or hindered your child with their transition to secondary school?

Question set 6. Conclusion

Is there anything further you would like to tell me about you and your child's experiences with reading difficulties?

Step 4. Conclusion and member checking

Thank you so much for talking to me today about your experiences. I really appreciate the time you have given me and your honest/considered responses. When I have finished all the interviews, I will send you and your child a copy of the main findings in a short summary and invite your feedback.

Appendix K

Chapter 3 and Chapter 4 Caregiver survey

Default Question Block

Curtin University
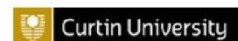
Parent/carer survey

Growing up with reading difficulties: Child and parent perspectives

Thank you for taking part in our study.

To help us understand more about you and your child we would appreciate your answers to the following questions.

Please click on the arrow in the bottom right hand corner to submit your answers. You have 2 weeks to go back and change/complete your responses if you like. Thank you!

Curtin University Human Research Ethics Committee has approved this study (HREC number HRE2021-0084)

My first name:

My child's first name:

My child's date of birth (DD/MM/YYYY):

My child's age (Year/month e.g., 11 years and 4 months):

My child's gender:

My child's school year:

The kind of school my child attends (you can tick more than one option):

- ☐ government
- ☐ independent
- ☐ K-12 (kindi to year 12)
- ☐ other (please use the space below to describe - you can make the box bigger by dragging the corner arrow down)

Who my child lives with (you can tick more than one option):

- ☐ one parent/carer
- ☐ both parents/carers
- ☐ siblings
- ☐ other (please use the space below to describe - you can make the box bigger by dragging the corner arrow down)

Age of brothers and sisters:

My child has been diagnosed with dyslexia:

- ◯ YES
- ◯ NO

Can you please tell us when the dyslexia diagnosis was made (school year and calendar year, e.g., year 4, 2019)

My child has another diagnosis:

- ◯ YES
- ◯ NO
- ◯ I don't know or prefer not to say

Can you please tell us about this diagnosis/es?

My child has received support (e.g. educational support at school or speech pathology/occupational therapy) for their reading difficulties:

- ◯ YES

○ NO

Can you tell us about the support received? It would be helpful to know what type of support it is, and for how long this has taken place, for example.

Is there anything else you would like to tell us about your child?

Appendix L

Reflexive journal extracts- redacted for publication

Appendix M

Chapter 3 and Chapter 4 Participant take home sheet

Curtin University
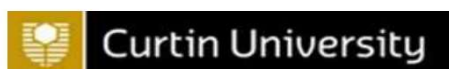
Take Home Sheet

Growing up with reading difficulties: Child and parent perspectives

Thank you for taking part in our study. Your participation will contribute to our understanding about mental health for children with reading difficulties and their families. Perhaps your interview raised some issues for you that you'd like to get some help with or just find out a little bit more about. Please find below contact details for kid's and parenting support services and telephone counselling services.

1) **Dyslexia-SPELD Foundation (DSF)**

Phone: (08) 9217 2500

Website: **https://dsf.net.au/**

You may already be familiar with DSF, but if not, visit their website for information regarding dyslexia and other learning difficulties. Additionally, DSF offer a range of services to assist families to support a child with learning difficulties and offer workshops for parents on a range of topics, including understanding anxiety in the context of reading difficulties. Visit, https://dsf.net.au/families, for information for families.

2) **Kid's Helpline.** For young people (under 25 years), and parents/carers.

Helpline: 1800 55 1800.

Website: http://www.kidshelp.com.au/

Kid's helpline provides confidential telephone counselling for young people (under 25 years) and parents/carers about any problem, big or small. If you call more than once you can ask to speak to the same counsellor that you talked to before. When you call Kid's helpline they will:

- listen to you talk about your problem.
- help you figure out how you are thinking and feeling about your problem.
- offer you some ideas about where you can go, or who you can talk to, to get further help with your problem.

3) **Ngala.** Parenting support and information to West Australian parents/carers of children aged 0-18 years.

Website: **http://www.ngala.com.au/**

Ngala Parenting Helpline: A free, telephone support service that operates from 8am-8pm, 7 days per week. Provides child development information, parenting support and referral. If you live in the Perth metro area call 08 9368 9368 or if you live in regional West Australia, then call: 1800 111 546.

4) **Beyond Blue – for mental health resources and support**
   Website: https://www.beyondblue.org.au/home

Beyond Blue offer a 24/7 confidential telephone counselling service with a mental health professional: 1300 22 4636.

Appendix N

Chapter 3 Child research summary

Families were provided with the following audiovisual research summary and invited to provide feedback. I have placed it as an unlisted YouTube video for this thesis.

https://www.youtube.com/watch?v=E7xT8v4Y2lc

Appendix O

Chapter 3 and Chapter 4 Caregiver research summary

Research Summary

Growing up with reading difficulties: Child and parent perspectives

The aim of our research was to learn more about risk and protective factors for mental health among children with reading difficulties. We hope that the results of our study can inform mental health promotion programs for children and their families.

Who did we speak to?

We spoke to 17 children (aged 9-14 years) and their mums about what it's like growing up with reading difficulties. All the children had a diagnosed reading difficulty (16 had a dyslexia diagnosis and 1 had a phonological processing difficulty diagnosis). Several children had other diagnoses, such as Attention Deficit Hyperactivity Disorder (ADHD) and/or dysgraphia (written language learning difficulty). All children were attending mainstream schools (government or non-government) at the time of the interview.

The interview transcripts were analysed using a method developed by Ginny Braun and Victoria Clarke[1]. This approach looks for patterned responses across all interviews. We developed three themes from our data. In the articles all themes are illustrated with quotes from our participants. Pseudonyms are used to protect you and your child's confidentiality.

Theme 1: Different in a good/bad way

All the children we spoke to were aware of their diagnosis and most were positive about the label. Dyslexia was described as a "different" way of thinking or learning: not necessarily better or worse, just different. Many parents described a long journey to diagnosis which required considerable family resources (time, money, and perseverance). Some parents explained that their children were "proud" of their dyslexia and/or that the diagnosis empowered their child to self-advocate or talk to their peers about their differences. Nevertheless, most children at one point or another had experienced their dyslexia in a negative way. Many, at times, described themselves as "dumb" or stupid" especially when they compared themselves to peers. In the class-room, parents perceived threats to children's self-esteem, such as reading charts that visually track their progress in comparison to peers. Parents are working hard to counter this by promoting their children's self-esteem in a variety of ways. For example, many parents actively pursue non-school based activities where their children can experience success. Doing so takes family resources (time, money) and often eats into homework time but is considered a high priority by families.

Recommendations:

- Families need recognition for the extra effort they put into supporting their children's self-esteem**.** Schools should take care to avoid practices and processes that highlight children's difficulties.
- Schools should provide avenues for children with dyslexia to showcase their strengths, and the opportunity for all children to learn in ways that allow children with dyslexia to achieve.

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[1] Braun, V., & Clarke, V. (2022). *Thematic Analysis: A Practical Guide*. Sage Publications.

- Using strengths-based language to describe dyslexia appears to be promoting a positive sense of identity among some children.

Theme 2: Burnt out and overwhelmed

Most children (and their parents) described school as a struggle. Many children persevere but some reach a point of giving up. Children described feeling stressed and confused in the classroom and annoyed about the impact that their reading difficulties have on their ability to achieve. Many parents described how their children "meltdown" after school through exhaustion or the build-up of stress and frustration that occurs through the school day. Some parents reported that their child experiences school-related anxiety and some families had experienced periods of school refusal. According to some parents, anxiety seemed to be linked to children feeling overwhelmed by school tasks, the pressure of assessments, or teachers who didn't care/shamed their children in front of peers. Many of the parents we spoke to were actively teaching their children about emotions and how to manage emotions. Children described a variety of ways they manage their emotions outside of school such as taking time out or playing sport or drawing, but during the school-day a lot of these strategies aren't available to them. Many children were excited about the move to high school but also a little worried, especially when they thought about increases in workload and the difficulty of work. Some schools were providing excellent transition programs for children making the move to high school.

Recommendations:

- Classroom practices which ease children's stress and allow them to take regular emotion regulation breaks are recommended
- Schools and dyslexia-specific support services should provide transition specific support to children with dyslexia moving from primary to secondary school
- Thought should be given as to the impact of homework on families

Theme 3: It takes a community: family-school connections

Feeling safe, supported, and valued at school seemed to be particularly important for children's wellbeing. There were many examples of individual teachers and allied health professionals supporting children's socio-emotional development. Unfortunately, there were also examples of teaching practices that were considered harmful to children. For example, teaching practices which expose children's difficulties to peers in ways that were considered humiliating or detrimental to self-esteem were discussed. The children we spoke to placed high value on friends and gave many examples of friends providing academic and emotional support. Some children had developed their own systems of support with friends, so that they helped each other out. Some children described instances of being laughed at or teased at school for their dyslexia-related challenges (such as poor reading or difficulty following instructions) but there seemed to be fewer instances of obvious and severe bullying described in our study than in previous research.

Recommendations:

- The high value placed on friendships highlights this as a protective factor for children's mental health. In terms of classroom practices, there is value in teachers (and others) harnessing peer support (such as by seating friends together in the class)

to address both the academic and socio-emotional wellbeing of children with dyslexia and other learning challenges.

PART 2: *parent experiences*

The aim of this part of our research was to learn more about the emotional experience of raising children with reading difficulties (dyslexia) and links to parent's wellbeing and support needs. This study is a companion study to our study regarding children's mental health (described above). We developed five themes which explored parent's experiences with raising children with reading difficulties/dyslexia.

Theme 1: Years in the wilderness: Life before diagnosis.

Many mothers described the years before diagnosis as being confusing and stressful. For many families there were barriers to receiving a dyslexia diagnosis for their child such as: cost, long waiting lists, and teachers (or others) that put them off course. Several mothers expressed how they wished they'd trusted their instincts more to pursue an earlier diagnosis for their child. Diagnosis was often described as a "relief" and meant that parents were better placed to negotiate support for their child at school or in the community. Nevertheless, even after diagnosis many parents felt misunderstood and unsupported.

Recommendations:

- Teachers are encouraged to listen to parent's concerns about their child's learning in the early years of schooling and direct parents to seek evidence-based information about learning challenges

Theme 2: "I struggle at times to see her struggle"

This theme explores mother's worry and secondary distress (often expressed as sadness and/or "heartbreak") at witnessing their child's school struggles. Some mothers expressed feeling worried about the impact that their child's reading difficulties had on their child's confidence or self-esteem. Many were also worried about their child's future, both their adult life, and the transition from primary to secondary school. Specifically, mother's worried about the impact of having multiple teachers (7 rather than just 1) on their ability to effectively advocate for their child in high school, as well as the impact of an increase in their child's workload on the family.

Recommendations:

- Schools and dyslexia-specific support services need to be aware of the impact that children's reading difficulties may have on parental mental health
- Parents may benefit by having one contact person in high school settings, so they are not expected to liaise with all the individual subject teachers
- Schools and dyslexia specific support services should consider providing additional support for families of children with dyslexia during the transition from primary to secondary school

Theme 3: School struggles – advocating for our children and managing distress.

Some of the families we spoke to felt that they had a good relationship with their child's school based on open and regular communication. However, many parents felt that they needed to advocate (and keep advocating) for their child's needs to be met at school so that their child didn't fall through the gaps. The mothers we spoke to had experienced varying levels of success with this advocacy. Some didn't feel listened to whilst others had found schools to be responsive to their suggestions and/or concerns. Mothers valued teachers who were caring and open to learning about dyslexia. Many mothers described how their child's school struggles flow into the home environment in terms of, conflicts about homework, and in some cases, anxiety, meltdowns, and school refusal. When this occurs, it can be distressing for families.

Recommendations:

- When schools listen and support parents, whole families benefit
- Schools and therapists (e.g., speech therapists) should carefully consider homework in the context of reading difficulties and other learning challenges so as not to overwhelm children

Theme 4: "It's a full-time job" and it's a "long slog"

In addition to advocating for their child at school, mothers described additional parenting tasks due to raising a child with dyslexia. Specifically, providing a lot of support with homework, organisational skills, and organising/taking children to after-school tutoring and therapy appointments. Some mothers felt like there simply wasn't enough time in the day to manage the workload. In some cases, the extra time and effort mothers put into supporting their child with dyslexia can negatively affect mother's stress levels and may impact family dynamics.

Recommendations:

- Families need recognition and support for the extra work that they do to support their children with dyslexia

Theme 5: Care for the carer: Social support and coping strategies

Many, but not all mothers, reported feeling isolated and unsupported in their parenting role. Outside of family, there was a sense that mothers received little practical or emotional support. Some felt that it was difficult for people to understand dyslexia if they'd not experienced it for themselves. Furthermore, many mothers expressed how difficult it is to find good information about ways to support their children with dyslexia. Some parents had received support and reassurance from health professionals, teachers and other parents of children with dyslexia. Furthermore, the mothers we spoke to expressed a range of ways they cope with the challenges such as: focussing on their child's strengths; "letting go" and/or changing expectations; staying positive; and focussing on how far their child has come. Most importantly it seems, having a good relationship with their child's school was protective of both parents and children's wellbeing.

Recommendations:

- Schools which nurture positive relationships with the parents of children with dyslexia are highly valued

- Peer support programs may be especially useful for parents of children with dyslexia
- Parents value easily accessible evidence-based information about parenting children with dyslexia with a focus on socio-emotional as well as academic needs
- Public awareness raising campaigns and teacher training about dyslexia may prove beneficial

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We thank you for participating in this research and we welcome your feedback.

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Appendix P

Chapter 5 Ethics approval

16-Mar-2021

Name: Mark Boyes
Department/School: School of Psychology
Email: Mark.Boyes@curtin.edu.au

Dear Mark Boyes

RE: Amendment approval
Approval number: HRE2020-0168

Thank you for submitting an amendment request to the Human Research Ethics Office for the project **Identifying predictors of mental health among children with dyslexia: A prospective cohort study**.

Your amendment request has been reviewed and the review outcome is: **Approved**

The amendment approval number is HRE2020-0168-09 approved on 16-Mar-2021.

The following amendments were approved:
Changes made to the Information and consent form, Qualtrics surveys an recruitment material based on the pilot testing and feedback from participants.

Special Condition of Approval:
It is the responsibility of the Chief Investigator to ensure that any activity undertaken under this project adheres to the latest available advice from the Government or the University regarding COVID-19.

Any special conditions noted in the original approval letter still apply.

Standard conditions of approval

1. Research must be conducted according to the approved proposal
2. Report in a timely manner anything that might warrant review of ethical approval of the project including:
   - proposed changes to the approved proposal or conduct of the study
   - unanticipated problems that might affect continued ethical acceptability of the project
   - major deviations from the approved proposal and/or regulatory guidelines
   - serious adverse events
3. Amendments to the proposal must be approved by the Human Research Ethics Office before they are implemented (except where an amendment is undertaken to eliminate an immediate risk to participants)
4. An annual progress report must be submitted to the Human Research Ethics Office on or before the anniversary of approval and a completion report submitted on completion of the project
5. Personnel working on this project must be adequately qualified by education, training and experience for their role, or supervised
6. Personnel must disclose any actual or potential conflicts of interest, including any financial or other interest or affiliation, that bears on this project
7. Changes to personnel working on this project must be reported to the Human Research Ethics Office
8. Data and primary materials must be retained and stored in accordance with the Western Australian University Sector Disposal Authority (WAUSDA) and the Curtin University Research Data and Primary Materials policy
9. Where practicable, results of the research should be made available to the research participants in a timely and clear manner

10. Unless prohibited by contractual obligations, results of the research should be disseminated in a manner that will allow public scrutiny; the Human Research Ethics Office must be informed of any constraints on publication
11. Ethics approval is dependent upon ongoing compliance of the research with the Australian Code for the Responsible Conduct of Research, the National Statement on Ethical Conduct in Human Research, applicable legal requirements, and with Curtin University policies, procedures and governance requirements
12. The Human Research Ethics Office may conduct audits on a portion of approved projects.

Should you have any queries regarding consideration of your project, please contact the Ethics Support Officer for your faculty or the Ethics Office at hrec@curtin.edu.au or on 9266 2784.

Yours sincerely

Associate Professor Sharyn Burns
Chair, Human Research Ethics Committee

Appendix Q

Chapter 5 Education Department of Western Australia approval

Department of
Education

GOVERNMENT OF
WESTERN AUSTRALIA

Your ref:
Our ref: D21/0490284
Enquiries

Dr Mark Boyes
Senior Research Fellow
School of Psychology, Curtin University
GPO Box U1987
PERTH   WA   6845

Dear Dr Boyes

Thank you for your application received 8 December 2020 to conduct research on Department of Education sites.

The focus and outcomes of your research project, *Identifying predictors of mental health among children with dyslexia: A prospective cohort study,* are of interest to the Department. I give permission for you to approach principals to advertise this research project, as outlined in your application and subsequent communication. It is a condition of approval, that upon conclusion, the results of this study are forwarded to the Department at the email address below.

Consistent with Department policy, participation in your research project will be the decision of the schools invited to participate, the children in those schools and their parents. A copy of this letter must be provided to principals when requesting to advertise the research through schools.

Responsibility for quality control of ethics and methodology of the proposed research resides with the institution supervising the research. The Department notes a copy of a letter confirming that you have received ethical approval of your research protocol from the Curtin University Human Research Ethics Office.

Any proposed changes to the research project will need to be submitted for Department approval prior to implementation.

Please contact Miss Veronica Ye, A/Coordinator, Research Applications, on (08) 9264 5512 or researchandpolicy@education.wa.edu.au if you have further enquiries.

Very best wishes for the successful completion of your project.

Yours sincerely

Alan Dodson
Director, System and School Performance

25 October 2021

Appendix R

Chapter 5 Child information sheet and consent form

Curtin University

Identifying Predictors of Mental Health among Children with Dyslexia: A Prospective Cohort Study

Child Information Sheet

Hello,

We are a group of researchers working at Curtin University.

We know that moving from primary school to high school can be stressful, particularly for children who have reading difficulties. We are doing a study to try and understand what might make this move a little bit easier. We are interested in the experiences of children with and without reading difficulties.

What will I be asked to do?

You will be asked to do a short reading assessment and answer some questions. These questions will be about yourself, about how you feel, about how you cope with your emotions, and about your relationships with friends, family, teachers, and school. There are no right or wrong answers and there will be an adult there if you need any help answering the questions. It will take between **45 to 60 minutes** to do the reading task and answer all the questions, and you will be able to take short breaks if you need to.

If any of the questions make you feel upset, you can skip the questions. You can also take a break any time. If you would like someone to talk to, just let the assistant know and we can fetch you parent/carer.

As we are interested in the move from primary school to high school, you will be invited to take part in the study again next year and the year after. To say thank you for helping with all of the questions, your family will get a $15 gift voucher each time you take part.

Do I have to take part?

No, you do not have to take part. If you decide that you do <u>not</u> want to take part, just let your parents/carer know, and they will tell us.

What if I want to change my mind about taking part?

You can change your mind at any time. If you decide you do not want to take part that is fine. Just let us know and you can stop.

What will you do with the information I give you?

The information from this study will be stored in a safe place at Curtin University until you are 25 years old. When we talk or write about what we learnt, we will not use your name. Your parent can ask to receive a summary of how you went on the short reading assessment. We will not tell anyone else your answers to the questions, unless your answers tell us that you are having lots of problems with how you think or feel. If they do, we will need to tell your parent/carer, so they can talk to us about how to best help you.

How can I be a part of this study?

Please talk to your parents/carer about this research and ask them any questions. If you <u>do</u> want to take part, please let your parents/carer know and read and sign the form below. This letter is for you to keep.

Thank you!

Curtin University

Identifying Predictors of Mental Health among Children with Dyslexia: A Prospective Cohort Study

☐ I have read and talked about the information sheet about the research study and I know what I will be doing to take part.

☐ I have talked to my parents/carers about the research.

☐ I know that I don't have to be involved in the study.

☐ I know that I can change my mind about taking part at any time.

☐ I know that my parent/carer will be told about my answers if they show that I have lots of problems with how I think or feel

☐ I understand that I need to write my name in the space below before I take part in the study.
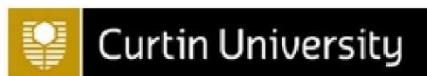
My name: _____

My signature: _____

Today's date (DD/MM/YYYY): _____ / _____ / _____

Researcher Name & Signature		Date:

Appendix S

Chapter 5 Caregiver information sheet and consent form

Curtin University

School of Psychology
Curtin University
GPO Box U 1987, Perth
Western Australia, 6845

Identifying Predictors of Mental Health among Children with Dyslexia:
A Prospective Cohort Study

Parent/Carer Information Letter

Dear Parent/Carer,

The move from primary to secondary school can be a stressful period for students. This move also happens during early adolescence, a time of increased risk for the development of mental health problems. This transition may be particularly stressful for children with dyslexia, due to the increased educational and literacy related demands placed on children. Our team of researchers at Curtin University are working to better understand the risk and protective factors associated with child mental health during the transition to secondary school.

We are interested in the experiences of children with and without reading difficulties.

The research is funded by the National Health and Medical Research Council and is being conducted with the support of the Dyslexia-SPELD Foundation (DSF). We would like to invite your child to take part in our study.

While the primary aim of the research is to understand how children with dyslexia navigate the transition from primary to secondary school, recruiting children without a dyslexia diagnosis to act as a comparison group is important. Additionally, this provides a valuable opportunity to understand risk and protective factors associated with child mental health during the transition to secondary school more broadly.

What does participation in the research project involve?
Children in Year 6 and their parent/carer will be asked to complete a survey about their social and emotional wellbeing. This will include information on their mental health, self-esteem and resilience, ability to regulate their emotions and cope with stress, as well as relationships with friends, family, teachers, and school. Children will also complete a short reading assessment. The reading test and questionnaires will be completed individually. You will also be asked to complete a short questionnaire about your and your child's social and emotional health, as well as your child's academic performance. You and your child will have the option to have the survey read aloud to you.

Your child's assessments should take approximately 45 to 60 minutes (including short breaks, if needed). Your survey should take approximately 45 minutes. We ask that you stay within the proximity of the study area so that you can support your child if needed. The assessment will occur **outside of school hours** and will be conducted with the support of research assistants (all will have current Working with Children Checks). A summary of all assessments is appended to this information letter.

As we are interested in the transition from primary to secondary school you and your child will be re-invited to participate in the study each year for up to 3 years. We understand that

finding time for this can be difficult. As a thank you for giving up your time, your family will receive a $15 gift voucher after each yearly assessment they complete.

What are the benefits of this research for me and my child?
There may be no direct benefits to you or your child taking part in this research. However, the research will identify potential risk and protective factors that could become the targets of mental health promotion interventions. Your participation may therefore benefit future children. You have the option to receive a non-diagnostic summary of your child's performance on a standardised reading assessment (*The Test of Word Reading Efficiency-2)*, if you choose. This summary can be shared with your child's School so they can support their literacy skills, if required.

Are there any risks?
You and your child will be providing information on your emotional well-being and mental health. Although unlikely, for some children reflecting on their emotional experiences may be upsetting. However, we have conducted similar research previously with no adverse experiences or negative feedback and children are also free to stop participation at any point. Parents will be requested to stay within the proximity of the study area to support their child if needed. All research assistants are trained in strategies to help manage emotional distress, if it occurs. All participants will have the option to take breaks if required, withdraw participation, and/or reschedule the assessment session.
If your child's results indicate that they are experiencing significant social or emotional problems, you will be contacted by a registered psychologist. Additionally, if your results indicate that you or your child are experiencing significant emotional difficulties then you will also be contacted by a registered psychologist to discuss pathways for additional support, if desired.

Do my child and I have to take part?
Your and your child's participation is entirely voluntary. This means you do not have to take part in this project. If you and your child would like to take part, we have included a consent form for you to sign. We have also included an information sheet and consent form for your child. Please talk to your child about the activities and let them know that they do not need to take part if they do not want to. Your decision about whether to take part in this project will not change your family's relationship with Curtin University in any way.

What if either of us was to change our mind?
If you give permission, but then change your mind, you and your child may withdraw at any time without consequence. So we can compare results for children who withdraw and those who do not, we would like to use the data that has already been collected before you or your child withdraws. However, you will be able to withdraw you and your child's data at any point up until the data is de-identified for analysis. Withdrawing from the study will not change your family's relationship with Curtin University in any way.

What will happen to the information collected, and is privacy and confidentiality assured?
When information is collected about you and your child, names and any personal information will be removed and a code will be given instead. Your and your child's information is stored this way so that we can combine information collected over time and match parent and child reported information. Only the researchers will know the codes that relate to the individual's data. Digital data will be stored in a secure research drive on the Curtin University server. Any hard-copy data (e.g. consent forms) will be stored in a locked filing cabinet that can only be accessed by the researchers. All data will be stored until children are 25 years old, after which it will be destroyed according to the Curtin University Functional Records Disposal Authority protocol.

The results of this project may be published and presented at a conference, but no identifying information about you or your child will be presented. The de-identified information may also be shared with other researchers or placed in a publicly accessible database, if this is a requirement for publication. Data from this project will also contribute to Adrienne Wilmot's PhD thesis. Adrienne Wilmot is part of the research team.

How do I know that the people involved in this research have all the appropriate documentation to be working with children?
Under the Working with Children (Criminal Record Checking) Act 2004, researchers and clinicians who work with children must pass a Working with Children Check.

Is this research approved?
Approval has been received from the Curtin University Human Research Ethics Committee (HRE2020-0168) and permission to advertise this study through schools was received by the Department of Education

Address: Curtin University Human Research Ethics Committee, Office of Research and Development, GPO Box U1987, Perth, 6845. **Phone:** 9266 9223 **Email:** hrec@curtin.edu.au

What if I have further questions about this research project?
Please do not hesitate to contact any us if you have any questions about the project. I can be contacted by phone on 9266 7025 or by email (mark.boyes@curtin.edu.au). You may also wish to contact one of the co-investigators (details below).

How do I indicate my willingness for me and my child to be involved in this project?
If you have had all questions about the research project answered to your satisfaction, and are willing for you and your child to participate, **please complete the Consent Form attached to this document and email to a member of the research team (details below).** We will also have hardcopy consent forms available for you to sign at the start of the assessment session.

Thank you!

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Curtin University

Identifying predictors of mental health among children with dyslexia: A prospective cohort study

ASSESSMENT INFORMATION SHEET (CHILD and PARENT/CARER)

This information sheet provides information about each assessment that you or your child will complete if you choose to take part in this project. By completing these tasks, we can see what emotional and social factors are related to mental health outcomes for children with reading difficulties. These factors are important when designing effective treatment programs for children with dyslexia.

You and your child will complete these tasks with the same researcher. All but one of the assessment tasks will be completed in person using an online questionnaire. There is one pen and paper assessment task that is completed by the child. You will be working with a Curtin University researcher who has been trained to administer these tasks and answer any questions that you have.

It will take approximately 45 to 60 minutes for you and your child to complete all the assessments (including short breaks, if required). This session will be held at a time and place that is convenient for you and your child. As indicated on the *Information Sheet and Consent Form*, you will be contacted by a registered psychologist if scores on any of the assessments marked with an asterisk (*) indicate that you or your child may be experiencing significant emotional or social problems.

CHILD ASSESSMENT TASKS

DEMOGRAPHIC INFORMATION

Information on child age and date of birth, gender, information on any siblings (number, age, and gender), school and school year will be collected.

READING

Reading Self-efficacy Scale

The Reading Self-efficacy Scale (RSS) is a 19-item questionnaire that will measure your child's their perceived ability to carry out reading-related tasks or reading-related challenges. The RSS will ask your child to rate the strength of their belief that they can carry out reading-related activities on a scale of 1 to 7. An example item from the RSS will ask your child to rate the strength of their belief in themselves to, "*Read out loud in front of the class*". The RSS will take approximately 5 minutes tom complete.

Test of Word Reading Efficiency -2

The Test of Word Reading Efficiency – Second Edition (TOWRE-2) is a standardised reading assessment. This test will measure your child's ability to read real and made-up words accurately

and fluently. Accurate and fluent reading are critical in the development of overall reading skills. The TOWRE-2 will take less than 5 minutes to complete

MENTAL HEALTH and WELLBEING

Revised Child Anxiety and Depression Scale (Short)

The Revised Child Anxiety and Depression Scale (RCADS) short-version is a 25-item self-report questionnaire that measures whether your child is demonstrating symptoms of depression and anxiety. The questions take approximately 5 minutes to answer.

Strengths and Difficulties Questionnaire (Child Report) *

The Strengths and Difficulties Questionnaire (SDQ-C) is a 25-item behavioural questionnaire that will measure your child's perception of their own social behaviour and emotions, as well as the presence of conduct and peer problem. The SDQ will ask your child to indicate how true each statement is about them. An example item from the SDQ is, *"I try to be nice to people. I care about their feelings"*. The SDQ will take 5 minutes to complete.

EMOTION REGULATION and COPING

Emotion Regulation Questionnaire – Children and Adolescents

The Emotion Regulation Questionnaire (ERQ) is a 10-item questionnaire that measures your child's ability to regulate their emotions. The questions tap into your child's ability to interpret situations in their environment and to control positive and negative feelings of emotion. These skills are related to stress, mental health, and coping. The ERQ takes less than 5 minutes to complete.

Emotion Awareness Questionnaire – Differentiating Emotions subscale

The Differentiating Emotions Subscale of the EAQ is a 7-item scale that identifies how well children understand their emotions. Children are required to rate how true each statement is about them. An example question from the EAQ DES subscale is, *"I feel upset and have no idea why"*. This questionnaire takes less than 5 minutes to complete.

Emotion Expression Scale for Children

The Emotion Expression Scale for Children (EESC) is a set of 16 questions that will measure your child's emotional awareness and the way they express negative emotion. The EESC requires children to rate how true each statement is about them. An example question from the EESC is, *"I know I should show my feelings, but it is too hard"*. This questionnaire takes less than 5 minutes to complete.

Difficulties in Emotion Regulation Scale (Short)

The Difficulties in Emotion Regulation Scale – Short (DERS-short) is an 18-item questionnaire that will measure your child's ability to regulate their own emotions. The questions cover awareness and understanding of different emotions, acceptance of different emotions, and how your child manages negative emotions. The questionnaire takes approximately 5 minutes to complete.

Adolescent Coping Scale – 2 (Short)

The Adolescent Coping Scale -2 (ACS-2 short version) is a 20-item questionnaire that will measure your child's ability to use a range of coping strategies in general and specific situations. The scale will ask your child to indicate how often they use a list of coping strategies. An example item from the ACS-2 asks your child to rate how often they, *"Talk to other people about my concern to help me sort it out".* The ACS-2 short version takes approximately 5 minutes to complete.

SELF-ESTEEM and RESILIENCE

Rosenberg Self-esteem Scale

The Rosenberg Self-Esteem Scale (RSS) is a 10-item questionnaire that measures your child's perspective of their self-worth by asking about their positive and negative emotions or feelings about themselves. Your child will be asked to rate how strongly they agree with 10 statements about the way they feel about themselves. An example item from the RSS is, *"I feel that I have a number of good qualities".* This questionnaire will take approximately 5 minutes to complete.

General Self-efficacy Scale

The General Self-efficacy Scale (GSS) is a 10-item questionnaire that will measure your child's belief in themselves to cope with a range of situations in daily life. The questionnaire will ask your child to rate how true each statement is about them. An example item from the GSS is, *"I can always manage to solve difficult problems if I try hard enough".* This questionnaire will take approximately 5 minutes to complete.

Connor-Davidson Resilience Scale - 10

The Connor-Davidson Resilience Scale – 10 (CD-RISC-10) is a 10-item questionnaire that will measure your child's resilience, or how well they are able to bounce back after a stressful event, tragedy, or trauma in their lives. The CD-RISC-10 will measure your child's ability to adapt to change, deal with things that come along, cope with stress, stay focused, maintain motivation, and handle negative emotions such as anger or pain. The scale will ask your child to rate how true each statement is about them. An example item from the scale is, *"I am not easily discouraged by failure".* The scale will take less than 5 minutes to complete.

CONNECTEDNESS and SOCIAL RELATIONSHIPS

Illinois Bullying Scale

The Illinois Bullying Scale is a 16-item self-report questionnaire that measures if, and how often, they experience bullying behaviour, fighting, and bullying victimisation by peers at school. The questionnaire takes less than 5 minutes to answer.

Hemingway Measure of Connectedness

The Hemingway Measure of Connectedness (HMC) will be used to measure your child's level of 'connectedness' to their school, peers, friends, teachers, siblings, and parents. Your child will complete 35-items that will ask them to rate how true each statement is about themselves. An example item from this questionnaire is, *"My parents and I get along well"* (parent connectedness). This questionnaire will take approximately 5 minutes to complete.

Multidimensional Scale of Perceived Support

The Multidimensional Scale of Perceived Support (MSPS) is a 12-item questionnaire that measures your child's perception of the adequacy of social support they receive from family and friends. The MSPS will ask your child to rate how strongly they agree with each statement. An example item from the MSPS is, *"My family really tries to help me".* These questions take approximately 5 minutes to complete.

<div align="center">

PARENT/CARER ASSESSMENT TASKS

</div>

DEMOGRAPHIC and DEVELOPMENTAL INFORMATION

Questions related to demographic information

You will be asked a series of questions relating to demographic and developmental information. Demographic information will include: postcode, child age, name of the child's school, and current school grade. Developmental information will include: confirmed neurodevelopmental or learning difficulties and history of service access and school supports.

Questions related to academic performance

You will be asked a series of questions relating to your perceptions of your child's academic performance. These questions will cover your view on your child's overall academic performance in the last 6 to 12 months as well as individual performance in literacy (reading and writing) and numeracy (maths). We will also ask you to describe any concerns about your child's learning that have been raised by teaching staff and any education or learning supports your child receives in the classroom.

MENTAL HEALTH and EMOTION

Revised Child Anxiety and Depression Scale (Short)

The Revised Child Anxiety and Depression Scale (RCADS) short-version is a 25-item questionnaire that measures your perception whether your child is showing symptoms of depression and anxiety. The RCADS take approximately 5 minutes to answer.

Strengths and Difficulties Questionnaire – Parent Report *

The Strengths and Difficulties Questionnaire Parent Report (SDQ-P) is a 25-item behavioural questionnaire that will measure your perceptions of your child's social behaviour and emotions, as well as the presence of conduct and peer problem. The SDQ will ask you to indicate how true each statement is about your child. An example item from the SDQ is, *"My child is….Considerate of other people's feelings".* The SDQ will take 5 minutes to complete.

Depression, Anxiety, and Stress Scale (21-item version) *

The Depression, Anxiety, and Stress Scale (DASS) is a 21-item questionnaire that will measure your mental health and wellbeing across three domains: depression, anxiety, and stress. The DASS will ask you to indicate how much a set of statements applies to you over the past week. An example from the DASS-21 is, "*I tended to over-react to situations*". The DASS-21 will take approximately 5 minutes to complete.

Children's Alexithymia Measure

The Children's Alexithymia Measure (CAM) is a 14-item questionnaire that will measure your perceptions of your child's ability to recognise and describe emotions in themselves and others. The CAM will ask you to rate how often your child does the action described in each statement. An example item from this tool is, "*When asked about how he/she is feeling, instead talks about what he/she has been doing*". The CAMS will take approximately 5 minutes to complete.

CONNECTEDNESS and SOCIAL RELATIONSHIPS

Hemingway Measure of Connectedness

The Hemingway Measure of Connectedness (HMC) will be used to measure your child's level of 'connectedness' to their school, peers, friends, teachers, and parents. You will complete 30-items that will ask you to rate how true each statement is about your child. An example item from this questionnaire is, "*My child would say 'our family has fun together'*" (parent connectedness). This questionnaire will take approximately 5 minutes to complete.

Social Skills Improvement System

You will complete the Social Skills subscales of the Social Skills Improvement System (SSIS). These subscales comprise 46 questions that will ask you about your child' social skills including their communication, cooperation, assertion, responsibility, empathy, engagement, and self-control. The SSIS will ask how often your child does each statement. An example item from the questionnaire is, "*I ask for help from adults*". The SSIS items will take approximately 10 minutes to complete.

If you have any questions regarding the assessments above please do not hesitate to contact a member of the research team. Details are provided on information sheet.

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Curtin University

***Identifying Predictors of Mental Health among Children with Dyslexia:
A Prospective Cohort Study***

Parent / Carer Consent Form

☐ I have read this information sheet. I understand the aims, procedures, and risks of this project and have been given the opportunity to ask any questions; and these have been answered.

☐ I have read the summary of assessments that will be administered.

☐ I am willing for me and my child to take part in the research project, as described. This is indicated by our completion of the child and parent consent forms.

☐ I understand that participation in this project is completely voluntary, and that my child and I are free to withdraw from participation at any time, without affecting my family's relationship with Curtin University.

☐ I give permission for the contribution that my child makes to this research to be used in conference talks and published in a journal, provided that my child and I are not identified in any way.

☐ I understand that I will be made aware of my child's results, if they indicate they are experiencing significant social or emotional problems. I understand I will be also be contacted by a registered psychologist (within a week), if my or my child's results indicate that we might be experiencing significant emotional problems, to discuss pathways for further support if desires (and assisted to access support if required).

☐ I understand that a summary of the overall findings from the research can be made available to me and my child upon its completion.

☐ I would like to receive a non-diagnostic summary of my child's performance on the *Test of Word Reading Efficiency -2*

Name of Child (please print): _____

Date of birth (please print): _____ / _____ / _____

Name of Parent/Carer (please print): _____

Signature of Parent/Carer: _____

Date (DD/MM/YYYY): _____ / _____ / _____

Researcher Name & Signature		Date:

Approval has been received from the Curtin University Human Research Ethics Committee (HRE2020-0168). Any questions or verification of approval for this study can be obtained by contacting the Committee.

Appendix T

Chapter 5 Child Survey (Redacted for publication)

Appendix U

Chapter 5 Caregiver survey (Redacted for publication)

Appendix V

Chapter 5 Mental health resources

The following resources were provided as part of a referral process when clinical levels of mental health concerns by either child or caregiver were reported.

Mental Health Resources

Services
Your General Practitioner (GP) GPs are available to provide assistance on a range of health-related inquiries including mental health. If you do not have an established relationship with a GP you can search for one who is in your local area using the Health Direct website Find a health service | healthdirect.
Beyond Blue – for mental health resources and support   Anxiety, depression and suicide prevention support - Beyond Blue   Beyond Blue offer a 24/7 confidential telephone counselling service with a mental health professional: 1300 22 4636.
Kid's Helpline. For young people (under 25 years), and parents/carers.   *Helpline:* 1800 55 1800.   *Website*: http://www.kidshelp.com.au/   Kid's helpline provides confidential telephone counselling for young people (under 25 years) and parents/carers about any problem, big or small. If you call more than once you can ask to speak to the same counsellor that you talked to before. When you call Kid's helpline they will: • listen to you talk about your problem.   • help you figure out how you are thinking and feeling about your problem.   • offer you some ideas about where you can go, or who you can talk to, to get further help with your problem.
Curtin Child and Adolescent Psychology Clinic: *http://healthsciences.curtin.edu.au/schools-and-departments/psychology-and-speech-pathology/clinical-services/child-and-adolescent-psychology-clinic/*   **Curtin Adult Psychology Clinic:**   Adult Psychology Clinic - Health Sciences | Curtin University, Perth, Western Australia   *Both clinics phone: 9266 1717*   **Fees at the Curtin clinics for adults or child/adolescent:**   Standard consultation: $45   Groups: $25

Appendix W

Chapter 5 Direct and indirect effects of reading on mental health concerns via domains of school connectedness
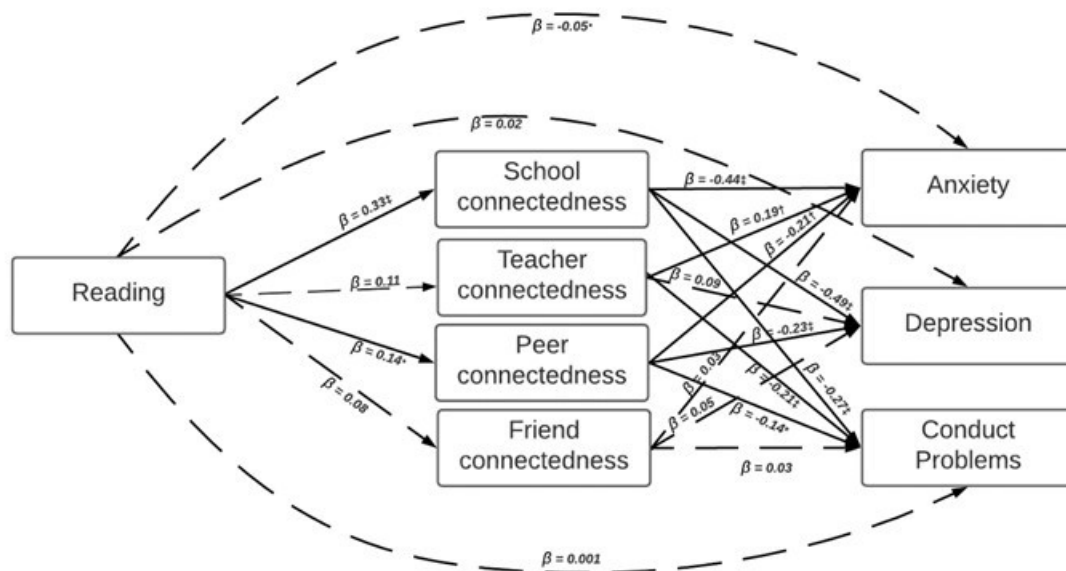

Figure 5.3: Direct and indirect effects of reading on mental health concerns by child report

Note: *p ≤ .05; †p ≤ .01; ‡p ≤ .001; dotted line = non-significant effect; solid line = significant effect; significance determined if CIs do not cross 0; effect sizes = $\beta = 0.1 - 0.29$, small; $\beta = 0.3 - 0.49$, medium; $\beta \geq 0.5$, large
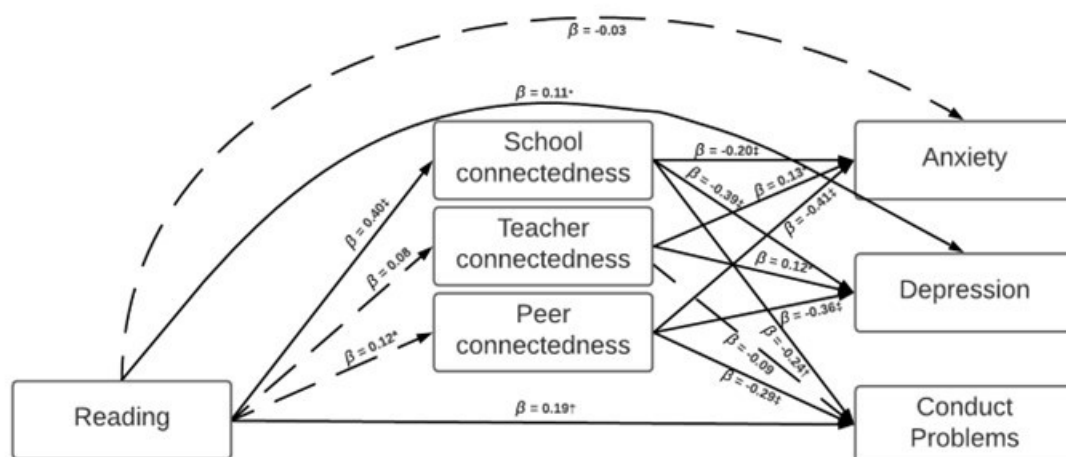

Figure 5.4: Direct and indirect effects of reading on mental health concerns by parent report

Note: *p ≤ .05; †p ≤ .01; ‡p ≤ .001; dotted line = non-significant effect; solid line = significant effect; significance determined if CIs do not cross 0; effect sizes = $\beta = 0.1 - 0.29$, small; $\beta = 0.3 - 0.49$, medium; $\beta \geq 0.5$, large