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Exploring Collaboration and Evidence-Based Practice in Speech-Language Pathology

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Abstract

Evidence-based practice refers to an integration between one's clinical expertise developed through professional development and previous experience, the most current and valid scientific evidence and the unique needs of a particular clinical setting. Recently, there has been a growing expectation of speech-language pathologists to engage in the evidence-based practice process despite awareness that real-world implementation is a complex task. Implementation strategies may be helpful in moving complicated research findings into clinical practice, but there is little research examining the practical use of these strategies. The current dissertation examines how four different implementation strategies, explored through two case studies, can be used to bolster clinical practice and aid in the evidence-based practice uptake process in the field of speech language pathology.

In chapter 2, collaborative relationships between speech-language pathologists and educators, in the implementation of an evidence-based language and literacy program for early-years students in an educational setting, were qualitatively examined. By investigating the complexities of this collaborative effort, barriers and facilitators to interprofessional collaboration were identified and explored. In chapter 3, the same language and literacy program allowed for the quantitative examination of changes in professional knowledge and confidence, and subsequent student language and literacy performance outcomes, following its implementation. This program involved investigating two approaches to moving evidence into practice: professional development sessions aimed at providing current evidence-based language and literacy education strategies and in-the-field coaching opportunities between speech-language pathologists and educators. In chapter 4, clinician readiness for real-world implementation of the evidence-based diagnostic label of developmental language disorder was investigated across practice settings. By examining current knowledge and practice, important future steps for adoption of this evidence-based practice could be acknowledged. Chapter 5 summarized the findings from these three empirical chapters, discussed the implications of this work, acknowledged the limitations of the current work and outlined considerations for future research regarding the use of implementation strategies in improving evidence-based practice in this field. Overall, this research will help to illuminate

several ways in which implementation strategies can be used to improve current practice and contribute to the successful uptake of EBP in the clinical world of speech-language pathology.

Keywords

Speech-language pathology, Evidence-based practice, Language and literacy intervention, Collaborative partnerships, Barriers, Facilitators, Professional development, Coaching, Developmental language disorder, Label application, Diagnosis

Summary for Lay Audience

Evidence-based practice is the combination of one's previous clinical knowledge and experience, the most current and accurate research findings and the needs of a particular clinical location. Recently, speech-language pathologists have been required to participate in evidence-based practice despite the known fact that it is difficult to do. Implementation strategies may be helpful in moving complicated research findings into practice, but there is little research looking at actual use of these strategies. The current thesis looks at how four different implementation strategies, in two case studies, can be used to improve clinical practice and help clinicians to use evidence in their work in the field of speech language pathology.

In chapter 2, collaboration between speech-language pathologists and teachers, in an evidence-based language and literacy program for grade one students across several schools, was examined. By investigating the challenges of these collaborations, barriers and facilitators could be identified and explored. In chapter 3, the same language and literacy program allowed for the opportunity to look at changes in speech-language pathologist and teacher knowledge and confidence, as well as student language and literacy scores, following its implementation. This program involved looking at two approaches to moving evidence into practice: professional development sessions aimed at teaching current evidence-based language and literacy education strategies and in-the-field coaching opportunities between speech-language pathologists and educators. In chapter 4, how ready clinicians were to implement the label of developmental language disorder was investigated across the field of speech-language pathology. By examining current knowledge and practice, important future steps for consistently using this label could be acknowledged. Chapter 5 summarized the findings from these three chapters, discussed the effects of this work, acknowledged the limitations of the current thesis and outlined considerations for future research regarding the use of implementation strategies in improving evidence-based practice in this field. Overall, this research will help to show several ways in which implementation strategies can be used to improve current practice and encourage successful use of evidence-based practice in the clinical world of speech-language pathology.

Co-Authorship Statement

Chapters 2, 3 and 4 of this dissertation are being prepared for submission to scientific journals. The language and literacy project outlined in the second case study, presented in chapters 2 and 3, was designed by two speech-language pathologists at the Toronto District School Board. Several speech-language pathologists and researchers contributed to the evaluation of this language and literacy project and are outlined below for each manuscript. My supervisor, Dr. Lisa Archibald, assisted in designing the questionnaire distributed as part of chapter 4 and provided feedback on all presented chapters of this dissertation.

Chapter 2: Kuiack, A., Leggett, J., Raffalovitch, S., Davison, C., Kuyvenhoven, C., & Archibald, L. M. (2023). Qualitatively investigating evidence-based collaborative practice between speech-language pathologists and educators.

Chapter 3: Kuiack, A., Leggett, J., Raffalovitch, S., Davison, C., & Archibald, L. M. D. (2023). Quantitatively investigating the impact of collaborative professional development and coaching between speech-language pathologists and educators on the language and literacy outcomes of early-years students.

Chapter 4: Kuiack, A. & Archibald, L. M. D. (2023). Identifying and describing developmental language disorder (DLD) in children.

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Chapter 1

1 Introduction

The concept of evidence-based practice (EBP) is rooted in the scientific method, or the systematic approach to understanding the world through observation, experimentation and hypothesis testing. Although the scientific method has been used for centuries, the concept of EBP was not popularized in the healthcare field until the 20th century. In 1972, Dr. Archibald Cochrane made an influential mark on the history of healthcare through the publication of his book entitled, "Effectiveness and Efficiency: Random Reflections on Health Services". In this book, he criticized the fact that many widely accepted healthcare interventions, at the time, were not based upon strong scientific evidence. He argued that healthcare providers were responsible for using the best available evidence to guide their practice rather than relying on tradition, previous experiences or anecdotal evidence (Shah & Chung, 2009). Although his publication shook the field of medicine, Cochrane was not the first, nor the last, to question the effectiveness or scientific validity of medical therapies. In 1996, Dr. David Sackett, a Canadian physician, popularized the term "evidence-based medicine" which he defined as, "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett et al., 1996). Sackett and his colleagues developed a systematic approach to researching and critically appraising current evidence on a specific topic and then using said evidence to inform subsequent clinical decisions (Sackett, 1996). Since this time, many variations of the term 'evidence-based medicine' have been used, including 'evidence-based guidelines', 'evidence-based decision making', 'evidence-informed patient choice' as well as the widely recognized term 'evidence-based practice' (Rycroft-Malone et al., 2004). EBP refers to an integration between the clinical expertise acquired through one's professional development and experiences, the best available research evidence from the scientific literature and the unique needs presented by a client or clinical setting (Sackett et al., 1996). Sackett and colleagues defined not only the fundamental principles of EBP but also five necessary steps in this process. The first step involves formulating a question aimed at improving some aspect of clinical practice or treating the needs of a specific patient. The second step involves searching for the best

possible research evidence—evidence that is of high quality and broad enough to ensure that it hasn't been selected to simply support preconceived notions. The third step involves the critical appraisal of the research evidence and the selection of the most appropriate information. The fourth step involves the application of the selected evidence to the specific clinical scenario or patient and the careful monitoring of the effects of said evidence. This application of knowledge must be combined with one's previous clinical experiences and the values of the patient. The fifth and final step involves evaluating the outcomes following the application of this new information and determining if/how this information should continue to be implemented moving forward (Sackett et al., 1996). In recent years, EBP has become a dominant and compelling theme in all areas of healthcare across the developed world including education, practice, management and policy (Rycroft-Malone et al., 2004). Today, EBP is considered to be a cornerstone of modern healthcare and has been promoted by organizations like the World Health Organization (Rodrigues, 2000) and the National Institute of Health and Clinical Excellence in the United Kingdom (Kelly et al., 2010).

1.1 The Standard of Evidence-Based Practice

The first component of Sackett et al.'s model of EBP is utilizing the best available research evidence. Few would disagree with the fact that practitioners should ensure that they are providing patient-centred care based on valid, scientific evidence. However, defining what evidence is and how practitioners use said evidence effectively in their clinical decision making, remains a challenging task. Discriminating between knowledge that is influenced by opinion and previous practice as opposed to that gathered directly from scientific evidence is a critical step in understanding and effectively providing evidence-based care (Kitson, 1997). There are several types of evidence that are considered to be valuable within the realm of evidence-based care. Evidence may be descriptive (i.e., gathered from cross-sectional or longitudinal studies), analytic (i.e., gathered from case-control or cohort studies) or experimental (i.e., gathered from randomized control trials) and understanding, and critically appraising, the evidence provided by these studies is a crucial step in implementing EBP (Gates & Atherton, 2001). For many years, well-designed randomized control trials have been viewed as the

gold standard of research evidence (Parahoo, 1997) and have frequently been used to guide EBP. Sackett et al. (1996) stated that when seeking applicable evidence, one must search for research that focuses on diagnostic accuracy, effective rehabilitation and preventative therapies while, above all, remaining patient-centred. This evidence may provide insight into new clinical practices that should be implemented or may provide evidence for the removal of outdated practices. When appraising evidence, a frequently encountered dispute exists between proponents of quantitative versus qualitative research. Which research approach is viewed as more reliable and valid has been a heavily debated topic for years (Gates & Atherton, 2001). Although this disparity between quantitative and qualitative research still exists in the literature today, Black (1994) made the critical point that, rather than viewing these two realms of research as dichotomous, the two should be seen as complementary. Both quantitative and qualitative research methods are rooted firmly in the tradition of empiricism or the understanding that knowledge should be based upon observation of the world (Upshur, 2001). While both types of research rely on data as the basis for reasoning and drawing conclusions, quantitative research's data are presented in numeric form, while qualitative research's data are presented in text form (Newman et al., 2006). Although quantitative research studies have historically been viewed as superior research evidence, it has been argued that qualitative research lends itself well to the healthcare field because clinical practice is an art that requires interpretation of both emotional and social phenomena in patient care (Giacomini & Cook, 2000). Qualitative research evidence may also lend itself best to the incorporation of previous clinical experiences as well as understanding patient experiences/preferences—the two other components of Sackett et al.'s model (1996).

Sackett and colleagues drew attention to the fact that the importance of balancing empirical research evidence with one's professional judgement and previous practice experiences cannot be underestimated—especially when determining the potential impacts of various interventions with complicated populations. Tsafrir and Grinberg (1998) surveyed physicians with a range of clinical experience as to which types of evidence they relied on most heavily in their practices. They reported that most physicians considered review articles and meta-analyses to be most reliable in terms of gathering evidence to drive their clinical interventions but when it came to addressing

practical patient care, they tended to rely more heavily on the opinions of, and anecdotal evidence provided by, their professional/expert peers (Tsafrir & Grinberg, 1998). This finding lends itself well to Sackett et al.'s very definition of EBP—the best available research evidence should be combined with one's clinical experiences. Clinical expertise can be viewed as non-propositional knowledge gathered from in-the-field experiences. While this type of evidence may not be as generalizable as the knowledge gathered from empirical research (Rycroft-Malone et al., 2004) it is still highly valuable in clinic.

Patient preference in care was also highlighted by Sackett and colleagues in their model of EBP. These researchers stated that, in order to provide the highest level of care, clinicians must truly understand a patient's values and preferences and must approach these values with compassion. Clinicians must work with the patient in making decisions about their care (Sackett et al., 1996). This task is not always simple, especially when a patient's preferences do not align with the other components of EBP—when they oppose the research evidence or one's previous clinical knowledge and experience. In these cases, the clinician must carefully balance all aspects of EBP in order to provide the highest quality of care possible.

One addition to Sackett et al.'s model of EBP that was proposed more recently was the context and environment in which patient care was being provided. This component refers to other knowledge that can be gathered through the clinician's environment like data gathered from other patients and knowledge regarding the professional culture existing within that specific care context (Stetler, 2001; Rycroft-Malone, 2004). Taken together, these four components (the best available research evidence, previous clinical experiences, patient preferences and the local care context) are the roots of EBP.

1.2 Evidence-Based Practice in Speech-Language Pathology

Speech-language pathologists (SLPs) are responsible for assessing, diagnosing and treating patients with speech, language, social communication, cognitive communication and swallowing disorders (American Speech-Language-Hearing Association, 1997). In

order to provide the highest caliber of care in this array of areas, EBP has been recognized as crucial and in recent years there has been a growing expectation of SLPs to engage in this process. In a 2005 position statement, the American Speech-Language-Hearing Association (ASHA) stated that SLPs are to incorporate the principles of EBP in their clinical decision making in order to provide high quality clinical care. ASHA stated that in order to provide truly evidence-based care, SLPs must a) recognize the needs and preferences of those to whom they provide services and combine these factors with the best current research evidence and their personal clinical expertise, b) acquire and maintain their knowledge and skillset related to EBP, c) evaluate all procedures and protocols to identify those that are maximally effective according to the appraisal criteria that is described in the EBP literature, d) evaluate the quality of all evidence presented to them (e.g., in research articles, textbooks, continuing education opportunities, advertising, products for purchase, etc.) and e) monitor and incorporate the newest and highest quality research evidence in their clinical practice (ASHA, 2005). By engaging in EBP, SLPs will provide improved clinical services, be more accountable for the interventions they are providing, provide more standardized care across patients and contribute to reducing the gap that exists between the scientific research and clinical practice (Schlosser, 2003). This ASHA position statement closely reflects Sackett et al.'s model of EBP so even those who are not familiar with their original paper, or their recognized components of EBP, will still be aware of the importance of EBP and of the practical steps for integrating EBP into their daily work.

It is well-known and well-documented that new scientific evidence can and should lead to changes in best-practice recommendations and patient care across treatment realms (Reilly, 2004). Providing high-quality, evidence-based care is central to the clinical services that SLPs provide. It is expected that SLPs will seek and integrate new evidence to ensure that patients are receiving the most up-to-date and effective clinical services (Ratner, 2006). However, it is a cumbersome task for SLPs to navigate the sea of evidence in their professional field. According to the most recent estimate, nearly 2.5 million new scientific papers are published each year (Plume & van Weijen, 2014). Although the number of academic papers directly pertaining to the profession of speech-language pathology is far smaller, the field is certainly diverse and includes many

sub-specialties and intersects with the work of many other professions (e.g., education). As a result, best-practice can only occur when SLPs are able to successfully manage the plethora of research evidence presented in the literature in combination with their clinical expertise, their knowledge of unique patient needs and their awareness of the specific clinical contexts in which they are providing services.

Because of the recognition of the importance of providing services rooted in EBP, the curricula provided to SLP students worldwide frequently incorporates the principles of EBP (Spek et al., 2013). The importance of providing students with knowledge of the principles of EBP and the skills to incorporate these principles into their future practices cannot be underestimated. However, the ultimate goal of teaching EBP to students is to develop their professional behaviours to ensure that they will actively engage in the EBP process in their future practices (Coomarasamy & Khan, 2004; Finn et al., 2005). Increasing students' knowledge and skills regarding EBP will only lead to a change in their behaviour if they also come to understand and believe that such a change is not only possible but desirable (Niemivirta, 1999). The concept of self-efficacy refers to one's belief that they are capable of performing a specific task (Bandura, 1986). This concept also reflects the understanding that if one does not feel capable of successfully completing said task, they may avoid it (Bandura, 2001). Unsurprisingly, self-efficacy is strongly related to academic achievement and success on certain domain-specific tasks like implementing EBP (Zimmerman, 2000; Parajes, 1996). Beyond self-efficacy, the value that students place on EBP, based on their perceptions of its importance, will also influence how likely they are to engage in EBP in the future (Kharrazi & Kareshki, 2010). In a survey of SLP students, Spek et al. (2013) found that, although there was a significant increase in EBP knowledge and skills across a three-year SLP training program, EBP curriculum did not increase self-reported levels of self-efficacy or task value in these students. These results were concerning for researchers and educators alike as a lack of confidence in competency likely has a negative impact on a student's willingness to engage in EBP in their future professional lives. Unfortunately, barriers like lack of self-efficacy and lack of task value are just two of many perceived barriers to EBP in the field of speech-language pathology.

1.3 The Perceived Barriers to Evidence-Based Practice in Speech-Language Pathology

A wide range of studies have been conducted in the past, across the health care field, determining what barriers exist in the face of successful implementation of EBP (Newman et al., 1998). Research has suggested that these barriers arise from a complicated interaction between social, organizational, political, cultural and economic factors (Newman et al., 1998). In 2004, Vallino-Napoli and Reilly sought to investigate SLPs' attitudes towards EBP and to identify any barriers that may interfere with the EBP uptake process. Results demonstrated that the majority of SLPs surveyed were familiar with EBP and saw research as highly valuable. Of these participants, nearly all reported having access to various sources of research evidence (e.g., continuing education opportunities, clinical guidelines, academic journals, etc.). However, despite the availability of evidence, many SLPs indicated that they rarely accessed these resources in their personal practice due, primarily, to a lack of allocated time (Vallino-Napoli & Reilly, 2004). In fact, 18% of survey respondents indicated that they never accessed academic journals as a resource during case management. A range of other studies have come to a similar conclusion—although there is overwhelming agreement among professionals regarding the importance of EBP, a lack of time to read and implement the research literature is the most significant barrier to the EBP process (Dunn et al., 1997; Newman et al., 1998; Metcalfe et al., 2001).

Other barriers to the implementation of EBP align nicely with research arising from other fields of healthcare (e.g., nursing) and present fundamental challenges to the EBP process. For example, a barrier to EBP is a long-standing culture of using tradition in practice. More specifically, when faced with a clinical problem, many professionals' first instinct is to consult their colleagues, rely on their previous clinical experiences or seek advice from easy-to-access generalized websites (Ratner, 2006). Although clinical expertise is an important component of EBP, without the integration of high-quality research evidence and patient perspectives the EBP process will be unsuccessful (Sackett et al., 1996). Additionally, much like the research suggesting that SLP students may lack the skills and confidence to implement EBP, SLPs working in the field may also be

unequipped to successfully engage in this process. SLPs may lack experience and skill in sifting through the plethora of research evidence accessible via computerized databases (Rappolt & Tassone, 2002) or in critically appraising the evidence to determine the quality of the presented research (Kamhi, 2006). Difficulty in either area will directly affect an SLP's ability to successfully implement EBP. Another commonly reported barrier to successful EBP in the speech-language pathology field is the setting in which one works. In some cases, EBP is seen as low priority in the eyes of management; thus, SLPs find themselves lacking the proper resources or facilities to even begin the EBP implementation process (Newman et al., 1998; Closs & Lewin, 1998). Finally, even if an SLP finds that they have the allocated time, the desire to stray from tradition in practice, the critical appraisal skills to navigate the scientific evidence and support from management in their place of work, there is still the possibility that the research they require to make evidence-based decisions will not be available. In 2004, Plante reported that the scientific evidence currently available in the speech-language pathology field does not nearly cover the vast number of approaches to treatment that are being employed. Although research in communication sciences and disorders continues to rapidly expand, a lack of scientific research in some areas makes employing the principles of EBP in clinical decision making extremely challenging. Despite overall agreement that EBP is essential to the practice of speech-language pathology, there are significant barriers that have been identified throughout the literature that may prevent its successful implementation (O'Connor & Pettigrew, 2008). In combination, these findings illuminate a greater truth of EBP – moving research evidence into practice is exceptionally challenging and due to this difficulty, there is a gap that often exists between research and practice.

1.4 Evidence-Based Practice for Speech-Language Pathologists in Education

According to a 2019 position statement by Speech-Language and Audiology Canada, "SLPs are essential members of educational teams supporting students of all ages with speech, language and communication challenges to achieve their academic and personal potential", and further that, "all students deserve access to timely, comprehensive,

evidence-based speech-language pathology services in Canadian schools". The various difficulties faced when implementing EBP in all areas of health care, and more specifically in all areas of speech language pathology, are also clearly demonstrated in the work of SLPs operating within the education system. There are a wide variety of different EBP recommendations, under a range of treatment categories, that are recommended for SLPs working with school-aged children. It is also noteworthy to consider the additional and unique challenges of investigating and implementing EBP in an educational practice setting. Some of these additional challenges may include academic guidelines presented by the government, specific goals presented by the schoolboards, ethical considerations, the involvement of other professionals like educators in the treatment process and the wide range of speech and language needs inherent to a school-aged population. Because of the inherent complexity of EBP, and the additional challenges that may be present in this practice setting, the implementation and outcomes of EBP are challenging to examine in a real-world educational setting. Following Sackett et al.'s model, EBP in the schoolboard requires an SLP's careful and intentional integration of their personal clinical expertise/experience, knowledge of the best and most up-to-date research evidence and the personal factors/preferences of each child and his or her family (Justice & Fey, 2004). At the root of this emphasis on EBP, when working with school-aged children, is a need for accountability among professionals when it comes to clinical decision making. According to Justice and Fey (2004), professionals in this setting have a responsibility to not only accumulate evidence aimed at resolving pressing problems faced in the academic world (e.g., methods of improving the success of at-risk children) but also to ensure that this accumulated evidence is translated into improved practice generally. However, the goal of effectively using research evidence in this practice setting is often exceptionally difficult for clinicians to achieve. Following a survey of nearly 3000 SLPs working in a schoolboard setting, across the United States, 25% reported that they were not trained in EBP (Hoffman et al., 2013). Additionally, echoing the findings of Vallino-Napoli and Reilly (2004), 91% of respondents reported that they had no scheduled time to support EBP activities in their practice within the schoolboard (Hoffman et al., 2013). This lack of time available to devote to EBP is not necessarily surprising considering the fact that

most SLPs working in an educational setting are faced with such heavy caseloads, and such limited time to service, that they find themselves having to prioritize student needs when providing care (McCartney, 1999). This massive barrier, present in the schoolboard setting, draws attention to an intrinsic problem of EBP—there is huge responsibility placed on clinicians to access, interpret and effectively translate research findings into their personal practice (Olswang & Prelock, 2015). This responsibility takes a great deal of time that schoolboard-based clinicians clearly struggle to find. The well-known, and well-documented, research-to-practice gap clearly exists in all areas of practice including clinical work with a school-aged population and in an educational setting.

1.5 Implementation Science and Implementation Strategies

In response to the clear gap between existing research evidence and clinical application, across populations and practice settings, implementation science was born. Implementation science refers to the study of various methods used to improve the quality of patient care, and patient health outcomes, following the systematic uptake of research into clinical practice (Eccles & Mittman, 2006). The primary goal of implementation science is to promote the adoption of EBP into clinical, health care, and educational settings to improve outcomes as well as to identify and address the barriers and facilitators to the uptake of EBP in these settings (Douglas et al., 2022). Implementation science can also be utilized to assess how an EBP treatment or program can be adapted to a specific clinical context while still maintaining its positive effects (Douglas & Burshnic, 2019). A critical aspect of implementation science is the recognition that the real clinical world represents an incredibly complex system that is influenced by a number of factors like policies and organizations (Goldstein et al., 2019; Olswang & Prelock, 2015). In the past, it was assumed that if scientific research was made more accessible, clinicians would apply this evidence to their daily practices (Harvey & Kitson, 2015). Because of this belief, tremendous effort has been made to make research easier to access and understand through the publication of systematic reviews, position statements and clinical guidelines (Douglas & Burshnic, 2019). Yet even these types of publications require clinicians to read, critically appraise and apply

these findings to their clinical practices—tasks that require a great, and sometimes unrealistic, time commitment from clinicians (Olswang & Prelock, 2015).

An important goal of implementation science is to identify, develop and test various implementation strategies (Powell et al., 2015). As such, there has been research conducted on these various strategies that can support the implementation process. In fact, strategies are a central principle of the National Institutes of Health's definition of implementation research which defines this type of research as, "the study of strategies to integrate evidence-based interventions into specific settings" (National Cancer Institute, 2015). More specifically, implementation strategies are defined as "methods or techniques used to enhance the adoption, implementation, and sustainability of a clinical program or practice" (Proctor et al., 2013). Throughout the literature, a variety of implementation strategies, and definitions of these strategies, have been proposed and discussed. Unfortunately, efforts to further develop and test these implementation strategies have been severely challenged by a lack of consistency in the terms and definitions used to describe these strategies (McKibbon et al., 2010; Powell et al., 2012). This idiosyncratic use of strategy terms may be due to the same term holding multiple meanings (i.e., homonymy), multiple terms being used to describe the same strategy (i.e., synonymy) or un unpredictable shift in the terms being used over time (i.e., instability) (Gerring, 2001). Further complicating the potential use/replication of implementation strategies in practice, either scientific or clinical, is a lack of published detail regarding the specifics of these strategies (Proctor et al., 2013; Michie et al., 2009). Challenges like a lack of clarity regarding the terms and definitions used to describe these implementation strategies reflect the same difficult truth that they were designed to assist with—moving evidence into practice is a complex and challenging task.

In 2015, in response to this lack of conceptual clarity, Powell and colleagues recruited a panel of experts in implementation science and clinical practice to generate consensus on a compilation of implementation strategy terms and definitions. This study generated a comprehensive list of 73 different implementation strategies that may be used to support the movement of EBP into clinical practice. Most of these strategies (n = 68) were previously identified by Powell et al. (2012) following an extensive search of the

strategies used across the implementation science literature. The researchers who constructed this original review stated that the compilation of implementation strategies outlined could be used as a tool by stakeholders wishing to implement clinical innovations (Powell et al., 2012). These researchers proposed that these implementation strategies may act as various methods of support for successful implementation of EBP in the clinical world. Many of these strategies may also prove to be beneficial in addressing the specific challenges unique to implementing EBP in an educational setting. To date, this real-world practicality of using these strategies to aid in the integration of EBP in various settings (e.g., the education system) has not been extensively investigated.

It is easy to imagine how a variety of the implementation strategies outlined by Powell and colleagues could play a crucial role in aiding EBP uptake in the educational realm (as well as other clinical areas). Examples of these strategies may include, but are certainly not limited to: assessing for readiness/identifying barriers and facilitators, conducting educational meetings, conducting educational outreach visits, creating learning collaboratives, creating new clinical teams, developing academic partnerships, developing and implementing tools for quality monitoring, distributing educational materials, identifying and preparing champions, identifying early adopters, involving executive boards, modelling and simulating change, organizing implementation team meetings, providing clinical supervision, providing ongoing consultation, shadowing experts, and tailoring strategies (Powell et al., 2015).

1.6 Examining Collaboration between Professionals

A frequently recommended EBP for bolstering practice in a variety of settings, including business, healthcare and education is interprofessional collaboration (Vangen & Huxham, 2003; Schot et al., 2020; Goulet et al., 2003). Interprofessional collaboration is defined as “an active and ongoing partnership often between people from diverse backgrounds with distinctive professional cultures…who work together to solve problems or provide services” (Morgan et al., 2015). There is a growing body of research suggesting that interprofessional collaboration between educators and SLPs working in education can have a positive impact on the academic outcomes of students (Archibald, 2017).

Evidence also suggests that this type of SLP-educator collaboration is especially important in developing the early language and literacy skills that are known to be critical to a student's academic success in later years. There is a plethora of research indicating that SLP-educator collaboration in language and literacy instruction is an EBP that has significant positive impacts on the education outcomes of students in a variety of areas (e.g., Gillam et al., 2014; Hadley et al., 2000; Throneburg et al., 2000). Additionally, there is evidence to suggest that collaboration may have positive effects, like increased confidence and appreciation of colleagues, on the professionals involved as well (Nippold, 2011).

Unfortunately, like many forms of EBP, the process of collaboration is difficult to examine and evaluate in practice. One approach particularly well suited to the study of a complex phenomenon like collaboration, and the complicated human relationships involved in this process, is qualitative research. Qualitative methods allow for a deep exploration of phenomena (Stern, 1980) and allow for individual perspectives to be investigated (Clark, 2010). Exploring collaboration serves as a perfect example of how qualitative research can provide a deeper understanding of an EBP than quantitative research could alone. In the current dissertation, through partnership with a school board, we were able to directly investigate the EBP of collaboration between educators and SLPs during the implementation of an early-years language and literacy program based on the most current scientific evidence.

By using qualitative research methods to examine the factors that both positively and negatively affected educator-SLP collaboration, we were able to also investigate one of Powell et al.'s EBP implementation strategies – the creation of a learning collaborative. Specifically, we were interested in investigating how the formation of these partnerships could foster a collaborative learning environment that would have a positive effect on the implementation of a clinical innovation—in this case an evidence-based language and literacy program.

1.7 Bolstering Practice through Professional Development and Coaching

Providing effective early-years language and literacy instruction is a challenging and complex task for educators. Recognizing this complexity, in combination with the modern push towards including students with a range of exceptionalities and special education needs in general education classrooms, the evidence suggests that additional professionals, like speech language pathologists, should be included as critical contributors to education (Suleman et al., 2014). In recognition of the potential impact that SLPs can have on language and literacy education, professional bodies like ASHA have issued statements advocating that no one individual professional (SLP or educator) is equipped to independently provide the highest quality of educational services to children—especially when it comes to critical components of early education like reading instruction. There is a plethora of research evidence describing the current best approaches to teaching children to read. In 2000, the National Reading Panel identified five key components of reading instruction that must be addressed when providing a truly comprehensive reading program: phonological awareness, phonics, fluency, vocabulary and text comprehension. Implementing an evidence-based instructional reading program that includes the explicit teaching of these five components of reading development is clearly best practice and can be achieved in a number of ways.

An effective way to ensure that research evidence is being translated into practice, without burdening professionals with the added responsibility of independently seeking this information, is to provide professional development opportunities. Professional development has been used in education for many years to provide professionals with the necessary information to continuously advance their knowledge and skill levels. Increasingly, professional development has served to keep early childhood educators, and other professionals in the educative world, up to date on the newest research, curricula and pedagogies related to language and literacy instruction (Powell et al., 2010). Furthermore, research has also suggested that professional development that includes coaching (receiving individualized feedback from an expert in the area) is most effective in improving the quality of post-professional development education provision. This type

of professional development model is based upon the latest scientific evidence and clearly represents an EBP. Investigating the effectiveness of this type of approach, aimed at improving subsequent reading education, allows for direct evaluation of an EBP as well as any implementation strategies involved in the process.

In the work addressed in this thesis, when examining the EBP of bolstering practice through professional development and coaching, two of Powell et al.'s implementation strategies were employed— the development of educational materials and the organization of implementation team meetings. Specifically, we were interested in examining how the language and literacy education provided to students could be improved following the creation of evidence-based professional development educational materials and following the provision of allocated time to come together to reflect on the implementation process.

1.8 Assessing Readiness for Implementation of the Label Developmental Language Disorder

Developmental language disorder (DLD) is defined as "language difficulties that create obstacles to communication or learning in everyday life that are unlikely to resolve by five years of age and are not associated with any known biomedical condition such as brain injury, neurodegenerative conditions, genetic conditions or chromosome disorders such as Down Syndrome, sensorineural hearing loss, autism spectrum disorder or intellectual disability". (Bishop et al., 2016; Bishop et al., 2017). Although approximately 7% of children have DLD (Norbury et al., 2016; Tomblin et al., 1997), there was no agreement regarding how to appropriately label these children with unexplained language problems (Bishop, 2014) until 2017. At this time, Bishop and colleagues recruited a panel of 59 experts in the area of child development and, following a detailed consensus process, decided that the label DLD would be used to describe these children.

Despite this consensus, diagnosing DLD in practice is not a simple task. The profiles of children with DLD are notably heterogeneous and the areas of language impacted by the disorder may include phonology, syntax, word finding and semantics, pragmatics/language use, discourse, and verbal learning memory (Bishop et al., 2017).

Further complicating this diagnostic process is the fact that language development and performance are influenced by many factors (e.g., learning more than one language simultaneously, exhibiting a comorbid disorder like attention deficit hyperactivity disorder, etc.) which can make it difficult to determine if the presenting difficulties truly represent a disorder. Challengingly, there is considerable heterogeneity between individuals with DLD so even SLPs who have diagnosed the disorder in the past may struggle with subsequent diagnoses. Although the EBP literature has demonstrated that relying on previous clinical experiences is not only helpful in clinical practice but recommended in Sackett et al.'s 1996 model of EBP, this past experience might not always inform future diagnostic decisions in the case of DLD. Consequently, managing the variable profiles of children with language disorders, and specifically diagnosing DLD, presents a significant challenge to practice. Further complicating the DLD diagnostic process are challenges in the assessment process—challenges that likely contribute to the known under-diagnosis and subsequent underservice of children with DLD (McGregor, 2020). DLD is a condition in which language competence is different than average. However, capturing and quantifying these impairments can occur in a variety of ways including through standardized tests, non-standardized tests and clinical judgments. To address the variability seen in diagnostic practice, Bishop et al. (2016) stressed that multiple sources of information must be combined in the assessment and subsequent diagnosis of DLD.

Despite consensus in the research literature regarding use of the diagnostic label DLD, a 2018 survey examining the current practices, beliefs, and attitudes towards diagnostic label provision for children with language disorders in a group of 370 English-speaking Canadian SLPs revealed a high level of inconsistency (Kuiack & Archibald, 2021). Results suggested that even though the vast majority of SLP participants (76%) were at least occasionally applying a specific label to describe children presenting with significant language delays, the label language delay was reported to be used most frequently while DLD was used least frequently in practice. Additionally, of 307 respondents, 26% reported that they were unlikely to use the diagnostic label DLD at that time. These results suggested that even though use of the label DLD was, and is, certainly a practice based on the best and most up-to-date scientific evidence, the uptake of the

label in the clinical world was still inconsistent at best. The results of this survey suggested that clinicians may not have the knowledge and skills necessary to change practice in this area. One implementation strategy identified by Powell et al. (2015), to encourage the uptake of EBP, is assessing readiness. A follow-up survey study investigating clinician readiness was planned as part of this thesis. By assessing how clinicians were currently using the label DLD in their practices, as well as identifying any barriers or facilitators that may have influenced this implementation process, we were able to directly investigate this particular implementation strategy. Specifically, we were interested in how ready clinicians were to change their current labelling practices in order to adopt the evidence-based label of DLD.

1.9 Objectives and Overview

The overarching objective of this thesis is to examine the effectiveness of a series of implementation strategies as they are employed in two EBP case studies in the field of speech-language pathology. The importance of EBP in this field is clear, but the real-world implementation of EBP is complex and dependent on a number of factors. Implementation strategies may be helpful in moving complicated research findings into clinical practice, but there is little research examining the practical use of these strategies. In the current dissertation, the real-world outcomes of employing four of Powell et al.'s (2015) identified implementation strategies, during the EBP process, will be explored in two unique case studies. The purpose of this exploration is to provide real-world evidence as to how these four implementation strategies can be used to bolster clinical practice and aid in the EBP uptake process in the field of speech language pathology.

The first case study involved investigating collaborative participation between SLPs and educators in the implementation of an evidence-based language and literacy program for early-years students in an educational setting. This case was divided into two chapters, reflecting two different EBP processes: a) examining collaboration between professionals (chapter two) and b) bolstering practice though professional development and coaching (chapter three). The second case study involved investigating clinician

readiness for real-world implementation of the evidence-based diagnostic label of Developmental Language Disorder (DLD) across practice settings (chapter four).

When examining the EBP of collaboration between professionals (chapter two), one of Powell and colleagues' identified implementation strategies, that may be used to aid in the adoption of this EBP into a practice setting, was utilized and explored. This strategy was to create a learning collaborative and was defined as the need to, "facilitate the formation of groups of providers…and foster a collaborative learning environment to improve implementation of the clinical innovation" (Powell et al., 2015). Specifically, the focus of this chapter was to examine collaboration between educators and SLPs as they implemented an evidence-based early-years language and literacy program.

Focused on another aspect of the same language and literacy project, chapter three examined the EBP of bolstering practice through professional development and coaching. This work incorporated two implementation strategies. The first strategy was related to professional development and involved the development of educational materials defined by Powell et al. (2015) as the need to "develop… supporting materials…that make it easier…for clinicians to learn how to deliver the clinical innovation." The second implementation strategy was related to coaching and addressed the organization of implementation team meetings defined by Powell et al. (2015) as the need to "develop and support teams of clinicians who are implementing the innovation and give them protected time to reflect on the implementation effort, share lessons learned and support one another's learning". These two strategies were used in conjunction while investigating the impact of an evidence-based language and literacy program and the subsequent outcomes of the early-years children involved in this program.

When examining the implementation of the diagnostic label DLD (chapter four), the implementation strategy of assessing readiness/identifying barriers and facilitators was utilized. This strategy was defined as the need to "assess…to determine degree of readiness to implement, barriers that may impede implementation, and strengths that can be used in the implementation effort" (Powell et al., 2015). This strategy was used to

investigate current practice and the point at which clinicians find themselves ready to change their current labelling practice in order to adopt the evidence-based label of DLD.

Overall, the findings emerging from this thesis will add to the EBP literature in the field of speech-language pathology. Specifically, the following three chapters will provide evidence for collaboration between SLPs and educators in early years language and literacy instruction, the effects of professional development and coaching on the language and literacy outcomes of young students and the implementation of the diagnostic label DLD in current practice. This dissertation will help to illuminate several ways in which implementation strategies can be used to bolster practice and contribute to the successful uptake of EBP in the clinical world.

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Chapter 2

2 Qualitatively investigating evidence-based collaborative practice between speech-language pathologists and educators

2.1 Introduction

Morgan et al. (2015) defined interprofessional collaboration as, “an active and ongoing partnership often between people from diverse backgrounds with distinctive professional cultures…who work together to solve problems or provide services”. Interprofessional collaboration allows for the achievement of greater goals than those one could achieve individually, the provision of services to larger groups of people and growth at both an organizational and individual level (Green & Johnson, 2015). This type of collaboration has been encouraged and studied between professionals in a variety of settings from business (Vangen & Huxham, 2003) to healthcare (Schot et al., 2020) to education (Goulet et al., 2003). There is a growing body of evidence demonstrating that collaboration between school-based speech-language pathologists (SLPs) and educators can positively impact educational outcomes (Archibald, 2017). SLP-educator collaboration in the area of literacy development is especially crucial to children’s academic growth. SLPs possess expertise in oral language skill development, which supports written language acquisition, while educators possess expertise in curriculum knowledge and classroom management. Collaborative practice between SLPs and educators is encouraged or required by many institutions and professional bodies. According to the American Speech-Language-Hearing Association (ASHA)’s Code of Ethics (2016), "individuals shall work collaboratively, when appropriate, with members of one's own profession and/or members of other professions to deliver the highest quality of care". More specifically, ASHA’s Ad Hoc Committee on the Roles and Responsibilities of School-Based SLPs (2010) describes collaboration with educators as a responsibility of the SLP. However, despite the many potential benefits of interprofessional collaboration, collaborative practice is challenging. Collaborations are notoriously difficult to manage with a high likelihood of disappointing outcomes (Vangen & Huxham, 2003). One reason that interprofessional collaboration is so

challenging is that it involves complex human relationships. Besides the inherent difficulty in nurturing these types of relationships in practice, they are also extremely difficult to evaluate and study in order to inform our understanding of successful collaboration. The purpose of the present study was to develop a deeper understanding of the factors impacting SLP-educator collaboration in order to inform future practice and to nurture the development of interprofessional collaborative relationships in the field.

Interprofessional collaboration in education is an area of growing interest and research effort. Collaboration in education refers to a joint effort between two or more professionals in working towards the common goal of meeting student needs and building student success within a classroom (Hartas, 2004; Archibald, 2017). It has been suggested that no one professional should be solely responsible for meeting the needs of all students within a classroom (Hartas, 2004). Many professionals engage in collaborative practice in an educational setting including, but certainly not limited to, SLPs and educators. Over the previous two decades, there has been increased research interest in classroom-based collaboration between SLPs and educators for a number of reasons including the promotion of skill generalization (Archibald, 2017). Research has suggested that providing intervention in an authentic setting, the setting in which the developing skills are needed, may lead to faster generalization of those skills (McGinty & Justice, 2006).

The idea of providing intervention in an authentic setting aligns well with the provision of inclusive education. Inclusive education can be defined as, “all students attend[ing] and [being] welcomed by their neighbourhood schools in age-appropriate, regular classes and [being] supported to learn, contribute, and participate in all aspects of the life of the school” (Inclusive Education Canada, 2015). Inclusive education has been demonstrated to improve educational outcomes for students with disabilities in a variety of academic areas, including literacy, when compared to peers with matched disabilities placed in a segregated classroom environment (Ruijs & Peetsma, 2009). Although admirable and necessary, inclusive education can be exceptionally challenging, especially in large classrooms with many students with diverse needs. By collaborating in the classroom, SLPs and educators have the opportunity to promote an inclusive environment

and more effectively help a greater number of students including struggling learners (Archibald, 2017).

In general, SLP-educator collaboration is a consistently recommended practice, which may be especially important in the area of oral language and literacy instruction—a complex but crucial area of focus in early education. This recommendation is born from the understanding that SLPs and educators have complimentary knowledge and skills that, when combined, create an important and effective partnership. Classroom educators are experts in understanding and working through the curriculum as well as managing the variety of needs within the classroom. Additionally, they play a critical role in first identifying children with speech, language and communication needs as well as providing continuous support for these students (Dockrell et al., 2017). SLPs on the other hand are experts in addressing speech, language and communication needs within a class, often with a particular focus on language as it relates to literacy development. This understanding, of the expertise offered by each profession, is the foundation on which the partnerships examined in the current study were built.

Existing literature has demonstrated that classroom-based SLP-educator collaboration can be beneficial in a number of different curricular areas including vocabulary (Throneburg et al., 2000; Hadley et al., 2000), phonological awareness (Hadley et al., 2000) and narrative language or the ability to tell a story (Gillam et al., 2014). Notably, the positive outcomes regarding vocabulary were seen in both students who qualified for speech and language services and their typically developing peers in the classroom (Throneburg et al., 2000). This finding is especially meaningful given the importance of supporting children with varied needs in mainstream classrooms in order to achieve successful inclusion (Shaddock et al., 2007). It is, however, important to note that the body of evidence supporting a collaborative approach to instruction should be interpreted cautiously. When comparing different types of SLP service delivery models in education, Cirrin et al. (2010) concluded that, overall, the research evidence in this area is insufficient and no one specific service-delivery model (e.g., classroom-based collaboration) can be deemed more effective than any other. Although individual studies have reported positive outcomes as a result of SLP-educator collaboration, investigation

of the effects of this type of service delivery model between SLPs and educators should continue, due to the acknowledgment that this is a nascent area of study.

Beyond the potential benefits reaped by students from SLP-educator collaboration, there may also be positive consequences experienced by the professionals involved. One potential benefit of these collaborations is that co-practice between SLPs and educators could result in both parties learning more about the other's discipline. For example, it has been reported that classroom educators are frequently approached by parents regarding their child's speech and language needs (McAllister et al., 2011); however, educators observe that they often do not feel that they possess the required knowledge, skills, or expertise to identify or intervene with children with speech or language needs (Antoniazzi et al., 2010; Law et al., 2000). With increased exposure to SLP practice through collaboration, some of these educator concerns may be alleviated. In general, SLP-educator collaboration provides a unique opportunity for educators to learn and implement specific strategies demonstrated by an SLP and for SLPs to gather a deeper understanding and appreciation of the skills children require for success in the classroom (Nippold, 2011).

There is a clearly documented push, in the world of education, for interprofessional collaboration. However, this type of collaboration is seen as beneficial and desired in a wide variety of other fields as well (e.g., business, healthcare, etc.). Across all professional fields, following a plethora of research studies, one truth is exceptionally clear—collaborative practice is not a simple endeavour. Unfortunately, studying collaboration, with the goal of improving its process, is also a very challenging task. Morgan et al. (2015) conducted a literature review with the goal of examining the nature of interprofessional collaboration, and the factors contributing to its success, in primary health care teams. The researchers chose to study collaboration strictly based upon direct observation methods arguing that, although more difficult and expensive to collect, real-time direct observation is a crucial and promising way to gain further knowledge about the implementation of interprofessional collaboration. In their review, both 'top down' (or 'macro' factors) and 'bottom up' ('micro' factors) were identified as influencing collaboration. Across the 11 studies, the macro factors identified were

primarily organizational. For example, both management/leadership and practice policy/structure could foster or hinder collaboration. In contrast, micro factors primarily included attributes of the individual participants including the importance of shared knowledge creation and shared clinical decision making in collaboration. These examples of micro factors not only reflect qualities of individual participants but also draw attention to the complex human relationships that must be acknowledged, and nurtured, during the collaborative process.

The importance and complexity of micro factors in the collaborative process was further explored by D'Amour and colleagues in 2005. In a literature review aiming to more aptly define collaboration, the researchers described four main concepts that were mentioned repeatedly in various proposed definitions of collaboration: sharing, partnership, interdependency and power. Firstly, sharing encompassed shared responsibility, decision-making, philosophy, values, data, planning and intervention (D'Amour et al., 2005). Secondly, the concept of partnership itself was repeatedly mentioned. Partnerships were described as relationships that were authentic and constructive, based on open communication and mutual trust/respect, possessed a sense of awareness of the contributions of others and involved the pursuit of a common set of goals (D'Amour et al., 2005). Thirdly, the concept of interdependency was a common thread across the literature and referred to the fact that successful collaboration required professionals to forgo autonomy and pursue an interdependence based on a common desire to serve (D'Amour et al., 2005). Finally, all relevant studies made note of the concept of power as it related to collaboration. Power was seen across the literature as needing to be based on one's experience and knowledge rather than prestige or titles. Additionally, power was seen as needing to be shared among all parties in a collaborative partnership and each party needed their respective power to be recognized by all (D'Amour et al., 2005). These four concepts paint an important picture of the complexity of micro factors necessary in successful collaborative partnerships. It is fair to assume that a key to understanding successful collaborations overall, is understanding the dynamics within each collaborative partnership. In other words, it would be impossible to truly understand the specifics, or measure the success, of a collaborative partnership

without studying the micro factors that are driving the complex human relationships necessary for collaboration.

Both macro and micro factors can be viewed as having either a positive or negative effect on successful collaboration. Those factors that are observed to foster the collaborative process can be defined as "facilitators" while those factors that are seen as hindering collaboration can be defined as "barriers". Specifically, in the area of SLP-educator collaboration, a variety of barriers to successful collaboration have been identified. Hartas (2004) questioned both educators and SLPs regarding their perceptions of collaboration with their colleagues and reported that both professional parties viewed time constraints and the rigid expectations/structures of their organizations as primary barriers to successful collaboration. Even though both groups acknowledged and appreciated their shared values and expressed a desire for professional growth through collaboration, time and the expectations of their governing organizations presented a major barrier to collaboration. Similarly, Throneburg et al. (2000) highlighted the importance—albeit challenge—of providing allocated time for educators and SLPs to plan together in order to effectively co-practice. These researchers found that collaborative planning required approval from administrators, classroom coverage for educators and funds to support the process (Throneburg et al., 2000). Allocating time and funds to support co-practice in the classroom may not be a reality for many educators/SLPs; it may also stand in the way of a genuine desire to collaborate. As outlined by Morgan et al. (2015)—micro factors, like desire for collaboration and appreciation of others' skills, are heavily influenced by macro factors like the expectations outlined by one's organization.

Another barrier identified by Hartas (2004) is the fundamental difference in the typical roles that educators and SLPs have historically played in the education system. Educators provide curriculum to an entire class, making modifications as necessary to meet the needs of individual students. On the other hand, SLPs commonly commission their services, targeting only those children with specific needs (McCartney, 1999). Because of heavy caseload demands, SLPs often must prioritize their service provision based on how the needs of one child compare to the needs of others (McCartney, 1999)

while educators do not have this same ability and must address the needs of all students in the class. Hartas (2004) stated that these differences in service provision may act as additional barriers to collaboration. Furthermore, both educators and SLPs are typically accustomed to working independently. Educators often have limited opportunities to interact with other professionals in the classroom, and SLPs most often act independently to select, evaluate and provide services to their clients (Hartas, 2004). Professional independence may create hesitation, on the part of either party, when it comes to collaborating and can act as an additional barrier to co-practice. It can be difficult to ask educators to share control of their classroom and curriculum and for SLPs to forfeit their independent decision-making (Hartas, 2004). These barriers clearly challenge D'Amour et al.'s (2005) identified concepts of sharing and interdependency and have the potential to stand in the way of fostering a successful collaborative relationship. It is important to recognize that these particular challenges are certainly not specific to the collaborative efforts between educators and SLPs. All professionals have a tendency to view their patients and/or services in a discipline-specific manner. This practice often fosters very specific views of their areas of expertise and of the frameworks and paradigms under which they operate (D'Amour, 1999; D'Amour et al., 2005). Combining these profession-specific frameworks to provide services can be exceptionally challenging for all parties, can lead to issues with D'Amour et al.'s (2005) concept of power and can challenge the very basis of a partnership.

2.1.1 The Current Study

The purpose of the current research study was to further our understanding of collaborative partnerships between SLPs and educators and to examine factors that hindered or facilitated these relationships and, subsequently, successful co-practice. The partnerships under study were established as part of a Grade One Language and Literacy Project in a local school board. This project had an overarching goal of improving the quality of language and literacy instruction, and thus the academic outcomes of students, through SLP-educator collaboration. By engaging in direct observation, as well as other means of data collection, we were able to explore the collaborative process as the project unfolded in 22 different schools.

2.2 Methodology and Methods

2.2.1 Methodology

One approach particularly well suited to the study of such complex phenomena, such as human relationships, is qualitative research. Qualitative methods allow for a deep exploration of an area (Stern, 1980), and provide opportunities for different individual perspectives (Clark, 2010). Multiple methods of data collection are employed in qualitative studies to allow for the triangulation of data and thus to provide a more comprehensive understanding of phenomena (Patton, 1999; Carter et el., 2014).

The methodological framework employed in this study was informed by grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1990). This type of approach involves retrospectively finding coherence and meaning in the experiences of an individual as they reflect on their past undertakings, feelings, choices, and outcomes (Goodwin & Horowitz, 2002, 35-6). The rich participant descriptions collected in such methodological frameworks, offer unique insight into the realities of how people act in specific situations and how social relationships may occur and develop (Morrill & Fine, 1997). Narratives arising from interview questions, can often produce and/or refine definitions, and understandings, of key theoretical constructs (e.g., barriers and facilitators to interprofessional collaboration)—constructs that are rooted in participants' personal experiences. In interpreting the narrative data, and incorporating in-the-field observation, we were able to better understand the dynamics of SLP-educator collaboration. More specifically, the research questions that guided our study were:

1. What facilitators, to successful collaboration, were experienced by SLPs and educators during their participation in the Grade One Language and Literacy Project?

2. What barriers, to successful collaboration, were experienced by SLPs and educators during their participation in the Grade One Language and Literacy Project?

3. What can be learned from the collaborative experiences described by SLPs and educators, participating in the Grade One Language and Literacy Project, in order to improve interprofessional collaboration in the future?

When using a qualitative research approach, it is critical to acknowledge both the researcher's and participants' subjective biases and the role they played in the study. Firstly, I recognize that the participants and I bring implicit biases to a study, which are views based on personal experiences. As a researcher, my own subjectivities influenced my thinking throughout the study. I am a trained SLP; the paper's co-authors and the professionals who conducted this study, analyzed its themes, and wrote the results are also primarily licensed SLPs. Although I made a conscious effort to view and treat SLP and educator participants as equal contributors in this project, implicit biases were present. It is also important to acknowledge potential participant biases in the responses gathered. That is, the participants may have reacted to what they thought the researcher desired (Greenberg et al., 1969). To reduce biases, research assistants (RAs) without training in either speech-language pathology or education captured data where possible.

Another limitation was the challenge of using collaborative language rather than directive language when describing the relationships born from this project and the themes that emerged. In other words, it was easy for an SLP-by-training to identify and speak about the coaching/knowledge that SLPs offered throughout the study and more challenging to see the coaching/knowledge that educators offered. This bias reflects a greater truth—collaboration between professionals, each passionate about their own practice, is extremely challenging. Biases may present an additional barrier to collaboration that was not formally identified by participants in this study.

2.2.2 Participants

A total of 16 classroom educators and 15 SLPs agreed to participate in this study. These participants were a subset of a larger group of SLPs and grade-one educators—all of whom were required, by their schoolboard, to participate in the project (but not the research study). All project participants were placed into SLP-educator partnerships for

the duration of the school year. Both the SLP and educator of 14 partnerships agreed to participate in the study. In the remaining cases, either just the SLP (n=2) or just the educator (n=1) from a partnership chose to participate. The 31 participants were individually invited to provide feedback regarding the intervention program, and the collaborative process, by completing several questionnaires and evaluations throughout the course of the project. Ten participants (made up of 5 separate SLP-educator pairs) also agreed to be directly observed during collaborative planning meetings and during co-practice in the classroom. Although one male participant was a part of this study, only she/her pronouns were used in this report (and quotes) to protect confidentiality.

2.2.3 The Grade One Language and Literacy Project

The Grade One Language and Literacy Project was planned for implementation in the 2018/2019 academic year (September to June). The project involved three single-day, whole-group, professional development (PD) workshops with implementation periods in between and followed by a debriefing session with the SLP group. The second two workshops were offered on separate days at two different locations, to accommodate all participants. Workshop 1 (October 2nd, 2018) focused on targeted assessment, understanding assessment results and utilizing decodable texts. Workshop 2 (November 5th and November 6th) focused on planning evidence-based language and literacy instruction. Workshop 3 (February 8th and March 5th) focused on continuing to implement evidence-based instruction and future steps in language and literacy instruction. These workshops were led by project designers, and co-authors, Leggett and Raffalovitch. Further detail regarding the content of these workshops, reading instruction and classroom reading outcomes are provided in chapter 4.

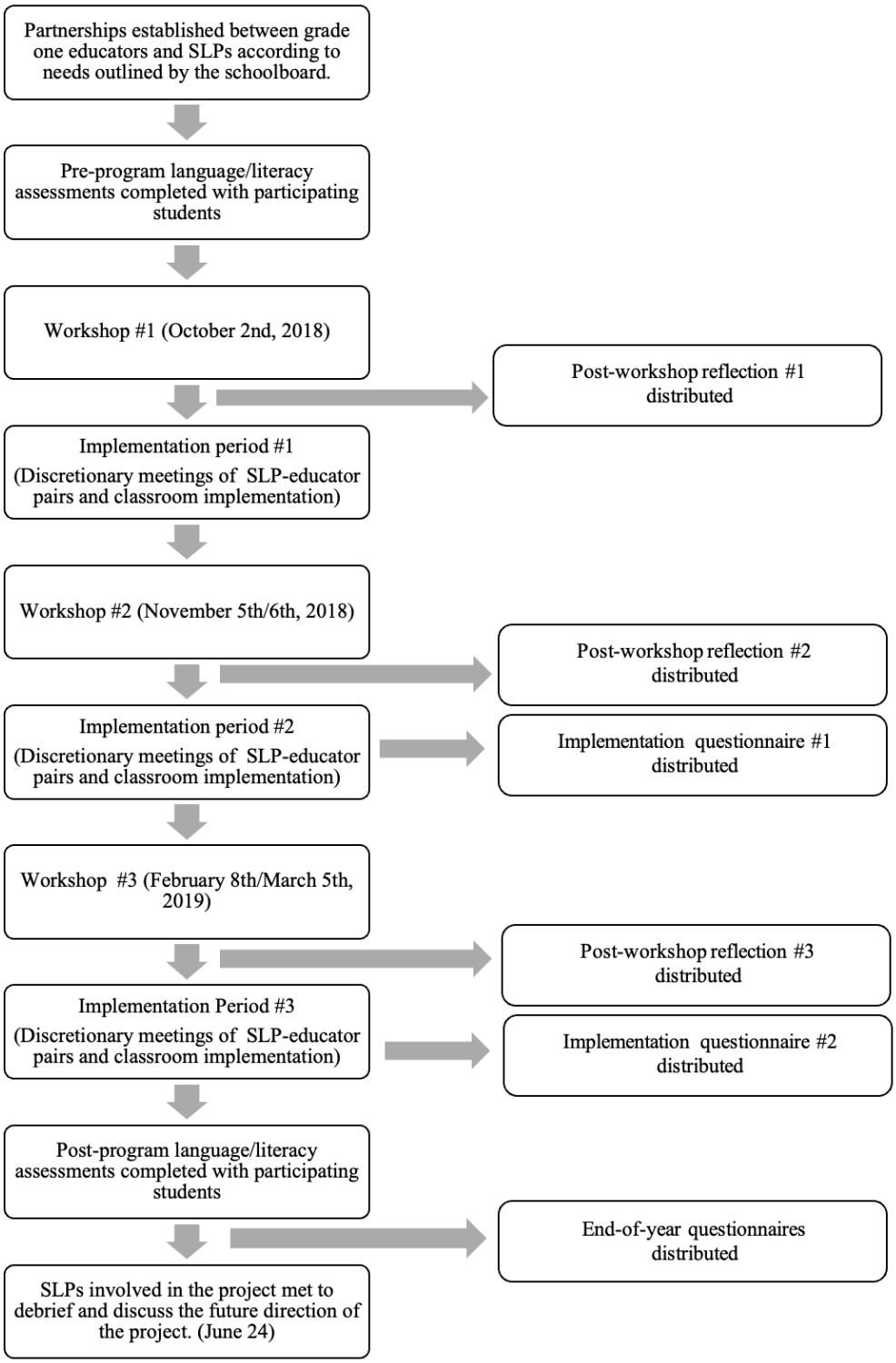
During the implementation periods between the three workshops, SLP-educator pairs met to review the concepts covered during the sessions and to plan for classroom implementation. This implementation period was directed by the needs of the grade one classroom and the nature/dynamics of each partnership. Although the aim of the project was for SLP-educator partners to spend one half-day per week collaborating, the implementation specifics were at the discretion of each pair. Five of these SLP-educator

pairs agreed to be observed, by a non-participant observer, either during collaborative meetings or during classroom implementation. One SLP, who's educator partner did not wish to be observed directly, was given permission by her partner to share the progress the pair was making via telephone calls. Thus, the experiences of six SLP-educator pairs were detailed via field notes by two trained non-participant observers. A total of 21 observation/telephone debriefing sessions were attended by these non-participant observers and summarized in field notes (see field note documentation section below).

Following the completion of the project, the SLPs involved met together to debrief and discuss the future direction of the project. A timeline of the project is outlined in Figure 2.1.

Figure 2.1

Timeline of the Grade One Language and Literacy Project



2.2.4 Study Procedures and Measures

Data for the current study came from questionnaire responses completed by individual participants, individual interviews with participants, or direct observation.

2.2.4.1 Questionnaires

Questionnaires were completed at several points during the study (see Figure 2.1): immediately after each workshop (post-workshop reflections), at the mid-way point between workshops (implementation questionnaires) and at the end of the project (end-of-the-year questionnaire). Although these questionnaires were largely focused on language and literacy outcomes (see chapter 4), each questionnaire included open-ended invitations to comment on the success of the project. Comments focused on collaboration and/or co-practice were included in the current study.

Post-workshop reflections were distributed to all participants following the first and second workshop sessions. These reflection questionnaires were designed to quickly assess what concepts were viewed as effective or memorable and capture how participants felt about the session. Participants were also asked to share any feedback (anonymously, if they wished) about their personal experiences throughout the program. These questionnaires included 4 open-ended questions:

1) What was the most important message(s) you took away from the workshop?

2) What was the most confusing point from the workshop?

3) Describe something(s) from the workshop that you plan to implement in your classroom teaching.

4) Please provide any feedback regarding the workshop.

Implementation questionnaires were distributed to all participants at the half-way point between workshop sessions. Relevant to the current study, this questionnaire

invited participants to share any comments or concerns that they had regarding their experiences during the implementation period.

End-of-the-year questionnaires were distributed to all participants at the end of the academic year. This final questionnaire was designed to evaluate participants' perceptions of, and participation in, the Grade One Language and Literacy Project overall. End-of-the-year questionnaires were individualized for classroom educators and SLPs. Educators were asked to answer open-ended questions reflecting on the changes in classroom implementation, perceived improvements in instruction and the likelihood of the project being continued into the next school year. SLPs were asked to answer open-ended questions related to changes in service delivery models, likelihood of continuing with the project, and specific oral language and literacy strategies implemented.

2.2.4.2 Direct Observation and Field Note Documentation

For partners who agreed to be observed during collaborative meetings and/or co-practice, a non-participant observer attended relevant sessions and collected field notes. The non-participant observers were trained research assistants (RAs) who were not otherwise involved in the study. RAs were trained, in person, for over 3 hours by the first author. Additionally, RAs were provided with a field note documentation guide and participated in monthly meetings with the first author. RAs were instructed to collect both the a) descriptive information and accurate documentation of factual data (e.g., date and time), actions, behaviours, and conversations that were observed, and b) reflective information, including records of thoughts, ideas, questions, and concerns during the participant observation. Additionally, during collaborative meeting observations, RAs were asked to rate how collaborative they felt the meeting was on a scale from 1 (not at all collaborative) to 7 (very collaborative). They also provided specifics about the topics discussed, the future plans made and the participants' next steps. During any classroom observations, RAs were asked to rate how engaged the class appeared to be on a scale from 1 (not at all engaged) to 7 (highly engaged) and to describe, in detail, the language/literacy lesson that was taking place. All field notes were transcribed and then coded by the first author, following their collection. A total of 24 collaborative meetings

and classroom co-teaching sessions were observed. Based on an estimate of once weekly meetings during implementation periods, approximately 19% of meetings were observed. In the case of the one SLP who was individually interviewed about her collaborative partnership, the RA asked questions to collect and record both descriptive and reflective information in their field notes.

2.3 Results

Data were transcribed, interpreted, and thematically coded by the first author, who sought to immerse herself in the data. The collected field notes, post-workshop reflections and implementation questionnaires were systematically analyzed line-by-line to identify any major themes in the data. Workshop session reflections included 23 responses to be coded, implementation surveys included 23 responses to be coded and end-of-year questionnaires included 82 responses to be coded. Additionally, field note documentation yielded 66 pages of text to be coded.

From this plethora of data, five major themes related to SLP-teacher collaboration were identified. These themes were: a gradual shift in responsibility/support, buy-in, time, recognizing strengths in a collaborative partner and PD participation. The identified themes (with the exception of time) acted as both facilitators (i.e., factors enhancing or contributing positively to successful collaboration) and barriers (i.e., factors impeding or contributing negatively to successful collaboration) in various situations. The theme of time was identified solely as a barrier to successful collaboration.

2.4 Findings and Analysis

2.4.1 A Gradual Shift in Responsibility/Support

A major theme that emerged from the data regarding SLP-educator collaboration was a gradual shift in teaching responsibility during collaboration. Generally, during the early stages of the project, SLPs were observed to take on a primary “coaching” role during classroom implementation. They frequently led activities while the classroom educator observed the instruction and assisted when needed. Several educators reported that

having their SLP partner complete a lesson showcasing language and literacy instruction strategies, with which the educator was less familiar, was beneficial for their personal learning and growth. This type of interaction became known as an SLP providing a model for his/her educator partner. Following a model by an SLP, most educators reported feeling more confident applying these learned teaching strategies independently. An educator participant stated that:

> "It has been amazing having her come in and implement literacy strategies in her teaching. I then have taken those strategies and applied them to my language instruction and guided reading groups" (Educator Participant, Partnership 4).

Similarly, an SLP participant shared that:

> "I see a lot more language concerns in [the] students than they do so I did a lot of modelling of language techniques and whole class lessons in the beginning… after modelling and conducting whole-class lessons the educator took a few weeks to do the lessons on their own" (SLP participant, Partnership 3).

It is important to recognize that, due to other job demands, SLP partners spent only a fraction of time in the project classroom compared to the educator partner. Importantly though, following a model, even when the SLP partner was not present, common language/literacy goals of the partnership could still be implemented with confidence by the educator. As the project continued to unfold, SLP-modelling was reported, and observed, less frequently during co-practice. This change in dynamic between partners truly marked a shift in responsibility/support and often mirrored an increased level of confidence in educators. In general, modelling of strategies was done during whole-class (referred to as tier-one) and small-group (referred to as tier-two) activities. As the year progressed, and confidence grew, SLP-educator pairs also gained a better understanding of the variable language and literacy needs present in their classroom. At this point, during language and literacy lessons, educators frequently provided most tier-one and tier-two interventions. Simultaneously, SLPs were frequently observed to provide more specialized one-on-one interventions (referred to as tier-three interventions) for children who were struggling and required more individualized

teaching. An educator participant shared that in her partnership, “It was ideal to work through tier 1, 2 and then 3 with the SLP gradually releasing support. Tier 2 and tier 3 are tougher to do without [support] though” (Educator Participant, Partnership 2). Of course, depending on the dynamics of the partnership, which partner provided which tier of intervention varied.

This type of approach to co-practice seemed to allow for the variable needs within a classroom to best be met. Four out of the five directly observed SLP-educator pairs explicitly mentioned this shift in responsibility and support. Additionally, it was frequently observed by the non-participant observers during the direct observation component of data collection. This theme was most frequently viewed as a facilitator to successful collaboration—when this gradual shift occurred it positively impacted the partnership and the implementation of the project. In some cases, one person in a partnership felt that a gradual shift in responsibility/support did not occur or was not successful. In these cases, participants felt more challenged and frustrated. In these cases, the gradual shift in responsibility/support acted as a barrier to successful collaboration and thus project implementation. One SLP participant shared that, “I enjoyed the project but wish there was more ownership from the teacher to carry out the strategies outside of the project days” (SLP Participant, Partnership 5). In cases like this, co-practice became virtually non-existent marking a type of breakdown in the partnership. While both the SLP and educator continued to work with the same classroom of children, they did so quite independently and were not necessarily working together towards common goals.

2.4.2 Buy-In

A prominent theme that emerged from the coded data was buy-in, or a lack there-of. Buy-in was observed to be a facilitator to collaborative success whereas a lack of buy-in served as a barrier. The participants in this project became involved based on the needs of their school. In other words, SLP-educator pairs did not voluntarily participate in the project but rather became involved if their school was seen as needing to increase early-years reading scores. As a result, the level of interest and buy-in between participants was

variable. Participation ranged from “minimal” (only attending PD sessions and completing required language/literacy inventories) to “maximal” (intensive collaboration between SLPs and educators throughout the entire school year including PD sessions, lesson planning and classroom co-instruction). In cases where buy-in was maximal, greater benefits were reaped. One SLP participant shared, “I find it very rewarding being in the classroom, and I know the teachers have taken away at least one thing each. They have said ‘Oh, I like that!’” (SLP Participant, Partnership 1). In cases where one party was viewed as participating minimally (a disconnect in project investment between the two partners), the project was described as “frustrating” and “challenging”. At the end of the project, during a debriefing meeting with all SLP participants, one project SLP stated that, “I will likely continue with the project, but at another school where I know the teacher is interested in collaborating” (SLP Participant 6). Another SLP shared a similar sentiment in the debriefing session sharing that, “it would be best, moving forward, to choose [our] teachers and schools. Laying it on schools hasn’t been the best approach” (SLP Participant 11). Similarly, when asked to share one thing that she would change about her service delivery model after participating in the project, another SLP participant stated that she would, “spend more time… getting buy-in from an interested teacher prior to starting collaborating” (SLP participant 7). Finally, following a final observation session with a non-participant observer, an SLP participant poignantly shared that, “collaboration is challenging and [the teacher] is hesitant to buy in…” (SLP Participant, Partnership 5). Experiencing a lack of buy-in from a collaborative partner was a significant barrier to the success of the project and negatively influenced how it was perceived by the other partner.

In cases where both partners felt equally invested in the project, the project was generally seen as more successful. Even if both partners bought-in equally, buy-in levels across partnerships also varied. Some pairs were engaged in implementing language and literacy strategies and instruction at a more minimal level (e.g., a short and standard amount of time being devoted to the project during specific language/literacy blocks of instruction) and some were engaged at a more maximal level (e.g., incorporating language and literacy strategies in many or all classroom activities). In general, higher levels of buy-in led to higher levels of perceived project success and enjoyment among

participants. The theme of buy-in extended to school principals as well. In some cases, participants shared that principals were viewed as acting strictly as an “administrator” while in other cases they were viewed as acting as an “instructional leader”. Those who took on an instructional leader role were seen as prioritising the project, supporting the educators involved and encouraging the carry-over of the project into future school years—thus creating a more successful project overall. One SLP shared that the principal of her project school was, “a strong leader which is so important—especially for project carryover to next school year” (SLP Participant 8). A lack of buy-in, by principals, had a negative impact on how the project unfolded and how SLP/educator participants could experience the collaborative process.

2.4.3 Time

Unsurprisingly, time (or rather a lack thereof) was the most frequently identified theme having an impact on the project and its participants. This project, by nature, required a large time commitment by both SLPs and educators. One educator participant shared that, “the project was a half day per week but in reality [there was] A LOT more time behind the scenes” (Educator Participant, Partnership 1). Additionally, one SLP participant stated the simple truth that, “it took a lot of time, but I found it very satisfying to see changes in the teacher and in the students” (SLP Participant, Partnership 4).

A lack of time was identified as the greatest barrier to the successful implementation of the project. Even pairs that were “maximal” in their project involvement, and buy-in, found time to be a common barrier faced in day-to-day implementation. One SLP participant shared that, “I wish I’d had more time to spend with the students” and that she desired an “increase [in] planning time with the teachers” (SLP Participant, Partnership 2). Again, at the final debrief meeting between project SLPs, one SLP participant stated that the, “biggest constraint is time” and, “as an SLP, I only have limited access/time to the project classroom” (SLP Participant 8). When asked if they would continue to implement the project in the coming school year, one SLP participant stated, “I would not repeat the project exactly because of the time commitment involved” (SLP Participant 9). Several participants also reported that the

educator in the pairing was not provided with sufficient classroom coverage to allow for collaborative planning during school hours. This lack of coverage may reflect a lack of overall resources/funding or potentially a lack of buy-in from administration. An SLP participant shared that she would ideally like to continue with the project but in reality, it, "depends on if time is allocated" as her, "planning was impacted by my teacher partner not getting classroom coverage" (SLP Participant, Partnership 5). It is worth noting that in some cases, this lack of project-allocated time was combatted by planning on personal time or using alternative methods of planning (e.g., meeting via Google drive, emails, phone calls) reflecting a higher-than-average level of buy-in and impressive dedication to the project. In reality, a lack of time for collaboration presented a challenge to most participants. The project was seen by many as requiring a substantial time commitment to be conducted properly—a time commitment that few pairs felt they were able to meet. Because of this fact, time was viewed as a barrier and participants felt that a lack of time for planning and collaboration had a negative impact on how the project unfolded in the classroom. In general, even for pairings that received the most allocated time for collaborative planning, more time to dedicate to the project was always desired. Although ample time for collaboration would act as a facilitator to the success of a collaborative partnership, time only presented as a barrier in the current study.

2.4.4 Recognizing the Strengths of your Collaborator

Recognizing the strengths of your collaborator was another prominent theme that emerged from this project. This theme presented as a facilitator to successful collaboration in some cases and (when not recognized), a barrier to successful collaboration in other cases. Pairs that found the project to be most successful, were those pairs who were outspoken in recognizing the strengths of their collaborative partner. SLPs who were outspoken in appreciating a) the knowledge that their educator partner had to offer regarding the learning skills/individual profiles of student participants and b) the effort that their educator partner put into learning and adopting new project practices in the classroom viewed the project more positively overall and demonstrated greater buy-in. Similarly, educator participants who appreciated the specific expertise of, and modelling provided by, their SLP partner viewed the project more positively. It was not

uncommon to have participants speak fondly of their project partner. In one specific partnership, the pairing perfectly exemplified how to reciprocally recognize a partner's strengths. Not only did they work very collaboratively throughout the school year, but they were also consistently outspoken about their appreciation for one another. At the end of the year, the SLP in this partnership shared that, "I hit the jackpot with my teacher partner. She is a very confident teacher. She's very strong in her ideas… and I listen carefully to what she feels strongly about. So, we really do blend together." (SLP Participant, Partnership 2). Sharing in this sentiment, the educator in this partnership expressed, "Overall, I was extremely fortunate to have an amazing SLP coach. She was extremely knowledgeable, professional and helpful towards both the students and me. The students and I LOVED having her in our class! She made learning enjoyable and fun at the same time" (Educator Participant, Partnership 4). Recognizing (and furthermore outwardly appreciating) the strengths of a partner allowed for more enthusiastic co-instruction in the classroom, ongoing learning and growth between partners, focused and effective co-planning of lessons and a more honest and positive relationship.

Participants that felt underrecognized or underappreciated for their strengths in project implementation, viewed the project as more challenging and less successful. Demonstrating this, one SLP participant somberly shared that, "the teacher was happy to have me there, but I don't think they would care if I wasn't" (SLP Participant 10). Lack of recognition presented as a significant barrier in some partnerships and ultimately to lead to a lack of enthusiasm about the working on the project which then often resulted in a lack of buy-in.

2.4.5 PD Participation (Shared Knowledge)

PD participation emerged as another important theme that acted as a facilitator to collaboration in some cases and a barrier in other cases. This theme was viewed as impacting not only collaboration but also the practise that resulted from the project. PD participation primarily arose from the field notes collected by the first author (at the PD session on November 6th, 2019) and by a non-participant observer (at the second PD

sessions February 8th and March 5th, 2019). To illustrate this difference, it was observed that:

> "Some partnerships are clearly excited and invested in this project. There are certain pairings that eagerly soak up the strategies being discussed, ask questions and participate readily. There are other participants in the room who seem less invested, almost unhappy to be here. In these cases, the partners (despite sitting together) do not appear to be working collaboratively" (Observer 1).

All of the participants who viewed the project as valuable, reported that they felt they would have benefitted from more frequent PD sessions. These participants felt that PD sessions were critical for their collaborative goal setting, lesson planning and in-the-field co-practice. Participants who engaged less actively in PD sessions also seemed to be less active in other areas of the project—like co-planning and co-practice following the PD sessions. Similarly, when discussing how her educator partner was feeling overwhelmed and frustrated by the content of the PD sessions, one SLP participant shared that, "I let her know that this is new to all of us, and we are all learning" (SLP Participant 12). This particular partnership struggled with an imbalance in PD session engagement as well as an imbalance in project implementation effort following these sessions. This resulted in the SLP in this pairing eventually abandoning weekly planning sessions and completing all post-project measures independently. Based on this received feedback, it is reasonable to assume that partnerships exhibiting an imbalance in PD participation may have lacked common knowledge and goals that were established during said sessions. As a result, collaborative co-practice was more challenging, and partnerships were more likely to break down. Participants in pairings with an imbalance in engagement levels, also reported greater feelings of frustration—another important theme arising from this study.

2.5 Discussion

The current research aimed to describe the facilitators and barriers faced by SLPs and educators as they worked collaboratively to implement an early-years language and

literacy intervention project. By employing a qualitative research approach and providing professionals with the opportunity to share their unique experiences throughout this project, we were able to deeply explore the complex phenomenon of interprofessional collaboration. Following the collection of both personal narratives and in-the-field observations, five themes were identified as being influential to successful collaboration: a gradual shift in responsibility/support, buy-in, time, recognizing strengths in a collaborative partner and PD participation. Most of these identified themes, with the exception of time, enhanced successful collaboration in some situations (acted as a facilitator) and hindered successful collaboration in other situations (acted as a barrier)—depending on the circumstances and/or the partnership dynamics. Time, acted strictly as a barrier to successful collaboration in this particular study.

Four of the five themes identified as a result of this study, are closely aligned with the concepts identified by D'Amour and colleagues in 2005 as being key to the very definition of collaboration—sharing, partnership, interdependency and power. D'Amour et al. defined "sharing" as encompassing shared responsibility, decision-making, philosophy, values, data, planning and intervention. When a gradual release of responsibility did not occur in a partnership in the current study, it presented a major barrier to successful collaboration because it directly challenged the idea that collaboration is built upon sharing responsibility, decision-making, planning and intervention. When participants in the current study faced the identified barrier of buy-in, this directly challenged the fact that successful collaboration is built upon sharing philosophy and values. When one half of a partnership was more invested than the other, there was a mismatch in the way that the project was viewed and the philosophy and values that were being brought forth during execution of the project. D'Amour et al. (2005) also spoke of the concept of "partnership" itself and of "power" as being important to successful collaboration. The researchers defined "partnerships" as needing to be authentic, constructive, based on mutual trust and respect and possessing a sense of awareness of the contributions of others. They stated that each party's respective "power" needed to be recognised by all. These ideas strongly support the identified theme of "recognising strengths in a collaborative partner" identified in the current study. In partnerships where there was strong and mutual appreciation for one another, this theme

presented as a major facilitator to successful collaboration. Despite being unsurprising and deceptively simple, consistent identification of this theme indicated how crucial it was in the observed collaborative partnerships. Of course, when there was an observed lack of recognition of a partner's strengths in the current study, successful collaboration was challenged. A final concept, identified by D'Amour et al. (2005) as being repeatedly mentioned in definitions of collaboration, was interdependency. They noted that, for collaboration to be successful, professionals needed to be interdependent in the pursuit of their goals and desire to serve. This concept lends itself to the identified themes of "buy-in" and "PD participation" in the current research. When there was a mismatch in a partnership's desire to engage in PD, set goals and work together towards successful program implementation, collaboration was far less successful. These four themes arising from the current research match well with the four main concepts identified by D'Amour et al. as being repeatedly mentioned, across the literature, as key to the very definition of collaboration.

The theme of "time" arising from the current study was unsurprising considering how frequently time has been identified throughout the literature as presenting a challenge to collaboration. Time was the only identified theme acting exclusively as a barrier in the current study with all participants involved voicing their concerns about not being given enough time to implement the project to the best of their abilities. Specifically looking at collaboration between SLPs and educators, both Hartas (2004) and Throneburg et al. (2000) identified that sufficient time allocation was critical yet exceptionally challenging when attempting to co-practice. This barrier seems to be well-established and long-standing and will likely be faced by most, if not all, collaborative partnerships between SLPs and educators.

Based on the five factors identified as facilitators and barriers in the current research study, an important over-arching theme arises, that of frustration. Although feelings of frustration were not explicitly described by any participants, sentiments of frustration could be identified as arising and interacting with all other identified themes and to varying extents across partnerships. Feelings of frustration were noted as some participants described their experiences during PD sessions. Whether due to feeling

overwhelmed by the presentation of new information or a lack of partnerships congruency in PD participation, frustration was noted in certain participant responses. During implementation periods, feelings of frustration were observed to arise when the expected gradual shift in responsibility between partners was not experienced. If one partner felt that they were carrying more weight of project implementation, sentiments of frustration became clear. These imbalances of responsibility ranged from a partner being slightly more responsible for project implementation to a partner completing all project implementation, and pre/post-tests, completely independently. This frustration could be felt when one SLP participant reported that, "they, [the teachers], are open to suggestions, but I feel like I've done the majority of the work and I'm not sure how much carryover there is when I'm not there" and, "I think that…the only time they use or implement my strategies is when I am physically in the classroom… I don't think they do much literacy stuff outside of that" (SLP Participant, Partnership 5). Another commonly reported source of frustration was an imbalance in buy-in between partners. Because collaborative partnerships were assigned rather than chosen, interest levels in the project were not always matched between the SLP and educator, sometimes leading to frustration with the project overall. One SLP participant shared that she, "has encountered restraint and uncertainty," from her educator partner (SLP Participant 12). These two previously discussed barriers were very much related to feelings of frustration that arose when a partner did not feel that their strengths were being recognized by their project partner. When one half of a partnership was responsible for carrying more/all of the project burden, sometimes due to a lack of buy-in, it was clear that those carrying more responsibility often felt that their efforts and strengths in project implementation went unnoticed by their partner. As might be expected, feeling a lack of recognition was frustrating for participants. The final and most identified source of frustration for participants was feeling that they were not provided with adequate time to fully engage in the project. Participants frequently spoke about how challenging it was to handle the demands of the project coupled with the demands from outside sources (e.g., other caseload demands for SLPs, and other curriculum demands for educators). Because time acted strictly as a barrier in this current study, and no participant felt that they had enough time to implement the project to the best of their ability, it makes sense that it was also

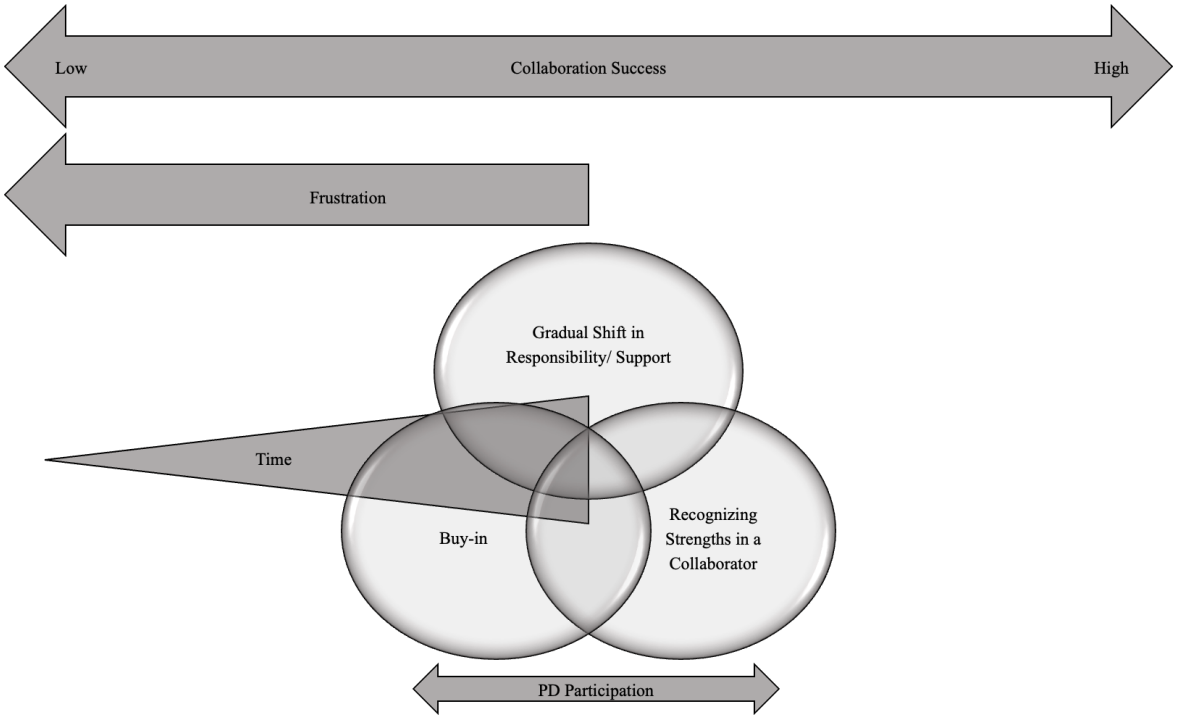
the most identified source of frustration for participants. Overall, frustration arose as the result of participants experiencing other barriers during the project and, in many cases, may have exacerbated the magnitude of said barriers. Overall, frustration was an important overarching theme arising from this study and acting as a further barrier to successful collaboration between SLPs and educators.

Similarly to how frustration was observed to interact with all five other themes identified in the current study, it is important to note that several of the five identified themes interacted with one another as well. The theme of a gradual shift in responsibility was related, in some cases, to buy-in. If buy-in presented as a barrier to collaboration (i.e., there was a lack of buy-in by one partner), a gradual shift in responsibility was less likely to occur and therefore more likely to also present as a barrier. The theme of recognizing strengths in a collaborator was related to both a gradual shift in responsibility and buy-in. When partnerships were more outwardly appreciative of one another, and the knowledge that each brought to the partnership, there was more buy-in from both halves of the partnership with both themes acting as facilitators in this case. When there was a lack of appreciation between partners (a barrier), buy-in also presented as a barrier. Similarly, when partners were appreciative of one another, there was more likely to be a more equal sharing of responsibility by the end of the project (demonstrating that the expected shift in responsibility had occurred). Additionally, if there was greater buy-in by both halves of a partnership (a facilitator), that partnership was more likely to positively participate in PD sessions (a facilitator). Although all five themes were easy to distinguish from one another, and exceptionally important in their own right, there was some important overlap identified as these themes interacted.

The themes arising from this study, and the ways in which they interacted with one another, are visualized in Figure 2.2.

Figure 2.2

A Model of Six Themes Influencing High Versus Low Collaboration Success



The overall success of collaboration is displayed at the top of the model. The level of success observed could be either high or low depending on the other factors represented in this model and how they interacted with one another. The overarching theme of frustration is also presented at the top of the model to indicate that it interacted with, and arose from, all five other themes identified in this study. Frustration arose as a result of the five primary themes being experienced as barriers to successful collaboration and this is represented by frustration's arrow leading towards low overall collaboration success. The themes of a gradual shift in responsibility/support, buy-in and recognising strengths in a collaborative partner are represented by three overlapping ovals to demonstrate how closely they interact with and influence one another. All three of these themes can act as barriers or facilitators leading to high or low collaboration success. The theme of time is represented as a triangle in this model demonstrating that less allocated time leads to lower collaboration success and more time leads to higher collaboration success. Because

time existed only as a barrier in the current study, it is only represented in the low half of collaboration success. However, in other collaborations, higher allocated time could act as a facilitator to collaboration success and therefore this triangle could, in certain cases, reach across the entire model. Time also overlaps with a gradual shift in responsibility/support, buy-in and recognizing the strengths of a collaborator because increased time spent collaboratively working on the project increased the likelihood that these three themes would act as facilitators to collaborative success rather than barriers. The theme of PD Participation is presented at the bottom of the diagram, in isolation, because it acts independently from all other themes yet can lead to high or low likelihood of collaboration success depending on how heavily each pair participates in the PD process.

2.5.1 Limitations

It is important to note that this research project was completed because of a partnership formed between the researchers and the department of speech and language services at the Toronto District School Board. Because of the nature of this partnership, the researchers were more directly involved with the SLPs in this project. This close partnership may have created a bias in the data, with the researchers gaining a more clear understanding of the SLPs' involvement in, and feelings towards, the current research project. Because this project was spearheaded by two speech language pathologists from the department, it is also possible that the SLP participants were predisposed to a greater level of professional buy-in during the project. It is conceivable that because of their closer involvement with the project, the SLPs could have been more invested and considered the project to be more important than their educator partners. The educators were not given a choice in whether or not they wanted to participate (in the project; they did choose to be in the research study), so it is entirely possible that they may have viewed the project as just another demand they needed to manage in the classroom. Because of these potential, inherent differences in professional buy-in, all participants may have been more critical of one another than they would have been if participation was optional for all and partnerships were formed naturally between those who had established strong working relationships.

2.6 Conclusions

The current research outlined the facilitators and barriers faced by SLPs and educators as they worked collaboratively to implement an early-years language and literacy intervention project. After deeply exploring the complexities of interprofessional collaboration, five themes were identified as being influential to successful collaboration: a gradual shift in responsibility/support, buy-in, time, recognizing strengths in a collaborative partner and PD participation. These identified themes, with the exception of time, acted as facilitators to successful collaboration in some situations and barriers to successful collaboration in other situations, depending largely on the dynamics of each individual partnership. In this particular study, time was strictly a barrier. This detailed look into the complicated nature of interprofessional collaboration brought to light themes that must be considered when entering, and maintaining, strong and successful collaborative relationships. In a sense, the results of this investigation, and specifically the visual model created to display these results, can be viewed as a “guidebook” for other professionals (especially those navigating a schoolboard setting) as to how to best approach and navigate an optimally successful collaborative relationship.

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Chapter 3

3 Quantitatively investigating the impact of collaborative professional development and coaching between speech-language pathologists and educators on the language and literacy outcomes of early-years students

3.1 Introduction

With high-quality instruction, most children successfully learn to read, at school, during the primary grades. According to the Ontario Human Rights Commission (OHRC) Right to Read Report (2022), a comprehensive approach to early literacy involves instruction that focuses on word-reading skills, oral language development, vocabulary and knowledge development, and writing. Years of evidence has supported the use of a structured literacy approach to teaching oral and written language for *all* students even those struggling with literacy difficulties (Spear-Swerling, 2019). The core features of structured literacy, and their value in effective literacy instruction, were recognized even before the term "structured literacy" was coined (Carnine et al., 2009; Moats, 1999). The use of an explicit and systematic approach to teaching foundational reading skills represents a 'high-leverage' intervention for the general classroom, that is, an evidence-based intervention with established effectiveness for supporting learning to read in all children (Spear-Swerling, 2019). By employing an effective universal approach aimed at supporting all learners, the number of children requiring more intensive or individualized support will be minimized. The OHRC Right to Read Report (2022) confirmed that the Ontario Curriculum, Language, Grades 1-8 (2006) and teacher education in Ontario Faculties of Education were not promoting a comprehensive, systematic approach to early reading instruction. Recognizing this difficulty well in advance of the publication of the OHRC Report, some school boards in Ontario embarked on an internal professional development program to enhance their reading instruction. At one local school board in Ontario, speech-language pathologists (SLPs) and classroom educators engaged in a year-long Grade 1 Language and Literacy project, in which they formed collaborative partnerships for learning and coaching aimed at infusing high-leverage instructional strategies into their grade 1 classrooms. The present study examined the outcomes related

to teacher and SLP knowledge, as well as student outcomes, following the implementation of this program.

3.1.1 What is High-Quality Reading Instruction?

Over time, and throughout the literature, a wide range of programs and approaches have been suggested, investigated, recommended and debunked within the realm of reading instruction. A well-known example of a set of seemingly contradictory reading instruction approaches, which has led to years of debate within the literature, is the explicit-phonics-instruction versus whole-language approaches to teaching children to read. These two oppositional approaches have colloquially been referred to as opponents in "the reading wars" and although there has recently been a call to end this pitting of approaches against one another (Castles et al., 2018), this example represents a larger truth across the literature – there is still a certain level of uncertainty when it comes to how best to teach children to read.

The Simple View of Reading (Gough & Tunmer, 1986; Hoover & Gough, 1990) states that reading comprehension is the product of word recognition and linguistic comprehension. This view, although well-recognized, is quite broad and therefore not necessarily effective in informing curriculum or helping to design a specific and effective reading program. In 2017, in recognition of the overall lack of specificity stemming from the simple view of reading, Kim (2017) suggested that a component approach to reading instruction may be more effective. Kim (2017) stated that even the authors of the simple view of reading recognized that both word recognition and linguistic comprehension involve incredibly complex processes. In fact, research in the past decade has revealed that word recognition alone requires multiple processes and skills including phonological awareness, orthographic symbol knowledge, orthographic awareness, rapid automatized naming and morphological awareness (Kim, 2017). By instead recognizing, appreciating and explicitly teaching the various linguistic components that are critical for high-quality reading instruction, we can better ensure that important skills for successful reading development are not missed in the curriculum.

A component approach to teaching reading lends itself nicely to the five key components of effective reading instruction that were identified by the National Reading Panel (NRP) in 2000: phonological awareness, phonics, fluency, vocabulary and text comprehension. The report generated by the National Reading Panel (2000) stated that for a reading program to be truly comprehensive, it would address all five of these components. Phonological awareness is defined as the ability to identify and manipulate the sound structures of a language. Research has demonstrated that phonological awareness skills can predict early reading abilities (e.g., Hogan et al., 2005) and the NRP stated in their report that instruction regarding phonological awareness is effective in also improving a child's phonemic awareness, reading outcomes and spelling. Phonics refers to one's knowledge of the letter-sound correspondences within a language. The NRP report (2000) suggested that explicit and systematic phonics instruction is important to children's learning (compared to an unsystematic approach or no phonics instruction at all). Reading fluency is described as the ability to read connected text accurately, at a conversational rate and with appropriate prosody and is viewed as a later-developing predictor of reading success born from practice and experience (Hudson et al., 2005; NRP, 2000). Vocabulary knowledge refers to one's understanding of a word's meaning (either spoken or printed). Effective vocabulary instruction involves provision of both definitional and contextual information regarding the word, as well as multiple exposures to the word, and has a positive effect on one's text comprehension (Stahl & Fairbanks, 1986; NRP, 2000). Finally, text comprehension itself involves the construction of meaning following the merging/interaction between one's background knowledge and information from a text. Text comprehension has been described as the very "essence of reading" (Durkin, 1993) and can be improved through the teaching of various comprehension strategies (e.g., Guthrie et al., 2004). Through their report, the NRP summarized decades of scientific research and concluded that, by addressing these five critical areas of reading instruction most children will be taught to read accurately, rapidly and with comprehension by the end of the third grade (NRP, 2000). The current research project adopted these five components, which were titled "pillars of reading instruction", in the focus of this language and literacy project.

Implementing an evidence-based instructional reading program that includes the explicit teaching of these five components of reading development is clearly best practice. One such approach has recently been termed a ‘structured literacy approach’ and involves: a) instructional methods that are highly explicit, systematic and sequential, b) the teaching of a range of literacy components including phonemes, letter-sound correspondences, syllable patterns, morphemes, vocabulary and sentence/paragraph/text structure, c) a high level of student-teacher interaction, d) carefully selected examples and nonexamples, e) decodable texts and f) prompt and specific feedback following student error (Spear-Swerling, 2019). A structured literacy approach has been shown to be effective for all students and has often been recommended for struggling readers, even those with dyslexia (e.g., International Dyslexia Association, 2016).

It is clear that language and literacy instruction is a complex task. Considering this complexity and recognizing that modern inclusive classrooms are home to students with a wide array of needs and exceptionalities, additional professionals, like speech-language pathologists (SLPs), are viewed as extremely important to the educative process (Suleman et al., 2014). In 1991, when addressing students’ speech and language needs, the American Speech and Hearing Association (ASHA) issued a statement indicating that no one professional (SLP or educator) was seen as possessing an adequate level of expertise to allow them to independently provide educational services to all students (Suleman et al., 2014). This statement demonstrated a clear recognition that both teachers and SLPs possess unique and important knowledge regarding speech and language development in childhood education. This acknowledgement was echoed by 25 educators and 17 SLPs surveyed regarding their views on collaboration in an educational setting when providing services to children with communication issues (Hartas, 2004). Results indicated that both teachers and SLPs recognized that child language and communication development is exceptionally complex and that no one professional should be solely responsible for fostering a child’s development in this area (Hartas, 2004). As such, during recent years, there has been a growing interest in investigating how collaboration between classroom educators and SLPs impacts the language and literacy development of early-years students. Interest in this area stems from this understanding that both SLPs

and educators have unique skill sets that, when combined, may be optimally beneficial to student learning in many curricular areas including reading.

When considering the five competencies (components) reported by the NRP as essential in effective reading instruction it is not hard to imagine that SLPs, with their extensive knowledge of linguistic concepts and typical/atypical language development, are uniquely equipped to support these instructional areas for all students learning to read as well as those students who have been identified as having a language disorder (Powell, 2018). This specialized knowledge was demonstrated by Spencer et al. (2008) who sought to compare the phonological awareness knowledge of SLPs and teachers (regular classroom, reading and special education). The researchers found that, regardless of the teaching assignment, all teachers were comparable in their linguistic content knowledge, and that this knowledge was significantly lower than that possessed by the SLPs. The researchers concluded that SLPs should be considered valuable resources for linguistic knowledge, like phonological awareness, in schools (Spencer et al., 2008). A classroom educator, while perhaps not as specialized in linguistic knowledge, has valuable expertise regarding curriculum expectations, large-group instruction and classroom management. It is easy to imagine that these areas of expertise are complementary and, therefore, one approach to improving the overall language and literacy education provided to school-aged children is to have SLPs and educators work together to provide intervention in regular classroom settings (Justice, 2006; Nippold, 2011). Collaborative efforts between SLPs and educators may allow for reciprocal coaching with SLPs explaining and modelling best practice approaches to literacy instruction and educators explaining and modelling successful classroom implementation. Existing literature has previously demonstrated the beneficial effects of classroom-based SLP-educator collaboration in a range of curricular areas including phonological awareness (Hadley et al., 2000), vocabulary (Throneburg et al., 2000; Hadley et al., 2000), and narrative language (Gillam et al., 2014). The purpose of the current research was to investigate the effects of SLP-educator collaboration in implementing a reading intervention program for grade one students.

3.1.2 Building A High-Leverage Structured-Literacy Grade One Language and Literacy Program

Response to intervention (RTI) is defined as a multi-tiered system that provides students with intervention increasing in intensity and tailored to their specific needs (Fuchs & Fuchs, 2006). RTI has been described as requiring a close level of collaboration between classroom educators and special educators including, but certainly not limited to, SLPs. Tier one instruction involves high-quality, scientifically based, whole-class lessons. Tier two intervention is provided to those students who are observed, or assessed, to not be benefitting from tier one instruction. These struggling students are therefore provided with small-group, specialized, interventions that vary in frequency and intensity depending on the observed needs. Finally, those students who continue to struggle following a period of tier two intervention may be provided with tier three intervention. Tier three intervention is the most individualized and intensive intervention and is provided to students usually in a one-on-one environment targeting specific skill deficits. This system allows movement away from expensive and time-consuming individualized assessments/intervention and rather employs progress monitoring for all students to determine if and when movement to a higher tiered intervention is warranted (Archibald, 2017). SLPs are frequently involved in the various tiers of RTI as they work collaboratively with educators (Roth & Troia, 2009).

In education, benchmark testing is frequently employed to measure a student's progress towards mastering a particular grade-level skill over time and to identify if/when children need higher-tiered intervention. This type of testing allows for educators to compare students to one another in order to create goals and track progress as well as for school districts to monitor yearly performance targets to improve overall instruction and achievement (Abrams et al., 2015). Although benchmarks can offer insight as to how a child is performing relative to their peers, measuring the specific change that a child demonstrates across a year, as a result of their learning, may not be captured by benchmark scores. For instance, even if a child's benchmark score does not change, the child may still have learned some new information, which points to the potential utility of a measure of individual change. Although paired samples t-tests were used in the current

study to demonstrate change across study participants from pre- to post-intervention, statistically significant change at this group level does not provide information regarding individual change within the group (Schmitt & Di Fabio, 2004). One measure of individual change is the reliable change index (RCI), which corresponds to changes beyond the 90% confidence interval (z-distribution cut score of 1.645) for a sample measure and is considered to be a true and reliable change (Estrada et al., 2018). Figure 3.1 shows the formula reported by Estrada et al. (2018), and outlined by Jacobson et al. (1999) and Jacobson & Truax (1991), used in the present study to assess individual change and identify the proportion of students demonstrating true and reliable change on study measures across the school year.

Figure 3.1

Jacobson et al.'s RCI formula as reported by Estrada et al. (2018)

$$RCI = \frac{D_i}{\sqrt{\left(S_{\text{pre}}\sqrt{1 - R_{\text{pre-post}}}\right)^2 + \left(S_{\text{post}}\sqrt{1 - R_{\text{pre-post}}}\right)^2}}.$$

The overarching goal of tier one intervention is to provide learning opportunities that are high-quality and lead to positive outcomes for all children (Justice, 2006), thereby reducing the overall need for tier two or tier three services. Research has demonstrated that when evidence-based tier-one reading instruction is implemented, it will meet the needs of 80-90% of students in the classroom (Searle, 2010). As such, it is imperative that tier one instruction be as effective as possible. It is at this tier that SLPs may work collaboratively with educators in providing high-quality and evidence-based instruction for an entire class as well as monitoring the progress of all students over time. There is clear evidence that SLP-educator collaboration can positively impact student success. For example, Gillam et al. (2014) found that there were significant improvements on first-grade narrative and vocabulary measures following the implementation of a narrative and vocabulary instruction program provided by an SLP in a regular classroom setting. These improvements were especially noteworthy for students recognized as high-risk in the classroom (those with known language difficulties). Hadley et al. (2000) compared

classrooms with regular programming to classrooms in which the educator and SLP collaboratively planned lessons, the SLP taught in the class 2.5 days per week and explicit phonological awareness and vocabulary lessons were included in the curriculum. Following six months of intervention the students in the experimental classrooms demonstrated superior gains on measures of receptive and expressive language, beginning sound awareness, letter-sound associations and sound deletion. Throneburg et al. (2000) compared three different service delivery models investigating curricular vocabulary instruction: a) collaborative teaching between an educator and an SLP, b) classroom-based intervention by an SLP without educator-SLP collaboration and c) traditional pull-out intervention for those students who qualified for speech and language services. Results demonstrated that collaborative teaching between the classroom educator and SLP resulted in increased curricular vocabulary knowledge for both the students who qualified for speech and language services and their typically developing peers in the classroom. Evidently, tier-one intervention, with contributions from an SLP, can result in positive outcomes for all students in a variety of language and literacy areas.

Identifying a tier one instructional reading program that benefits a majority of students is crucial when aiming to meet the diverse learning needs of all children within a classroom. Structured literacy is one such approach; however, structured literacy is not used consistently in schools and many educators are not prepared to implement its core features (Spear-Swerling, 2019). Spear-Swerling and Cheesman (2012) demonstrated this lack of structured literacy implementation when they conducted a survey of licensed educators in the United States and found that over half of participants were unable to recognize when a student with poor decoding skills was provided with a book that was beyond their reading level. The authors argued that the results of this survey indicated that many educators required professional development opportunities that involved structured literacy and education regarding the science of reading. These findings provide further evidence that, in order to build a strong, evidence-based tier one reading intervention, especially one that employs a structured literacy approach, effort must be made to first educate the professionals involved. This need for professional development has been especially crucial in Ontario because, as recently reported in the OHRC Right to

Read report (2022), Ontario teachers have not received training in structured literacy as part of their college training curriculums.

Professional development has long been used in education to provide professionals with continued opportunity for growth and advancement in their knowledge and skill levels. Increasingly, professional development has served to keep early childhood educators up to date on the newest research, curricula and pedagogies related to language and literacy instruction (Powell et al., 2010). However, measuring the quality or success of professional development is a challenging task. Previous research investigating professional development, both regarding professional knowledge growth and student outcomes, has been largely inconclusive. According to a systematic review of studies focusing on professional development related to language and literacy instruction (Markusson-Brown et al., 2017), professional development generally increases the process (educator-child interactions) and structural quality (provision and placement of language/literacy materials) of education but has little effect on educator knowledge regarding language and literacy concepts. The researchers suggested that perhaps increased educator knowledge may not be necessary to produce an increased quality of practice. Furthermore, current research has suggested that the relationship between knowledge and practice is often very complex and is not completely understood at present (Schachter et al., 2016). Although, specific knowledge gains may not be observed in those professionals participating in professional development sessions, it is reasonable to assume that due to improved process and structural quality of the education provided following professional development, student outcomes may be (positively) affected.

Because there are noteworthy potential benefits to professional development, there has been increased research effort, in recent years, investigating professional development best practices. In 2010, Zaslow and colleagues conducted a review of the early childhood professional development literature and suggested that professional development may be more effective when there are specific goals outlined and when practice is included as part of the professional development to aid in the knowledge-to-action process. Additionally, it was suggested that collective participation by more than one educator can lead to more effective professional development outcomes (Zaslow et

al., 2010). In their systematic review, Markusson-Brown et al. (2017) also found that professional development that included coaching (receiving individualized feedback from an expert) was most effective in improving both process and structural quality of post-professional development education. This is likely due to the fact that coaching allows for in-the-field feedback, fine-tuning of practice and continuous opportunities for growth. As a concept, models that involve coaching reflect a best-practice approach to professional development. However, coaching must be approached carefully with collaborative teaching partnerships—like those between educators and SLPs. Coaching suggests the existence of an "expert" providing coaching and feedback to another party. This type of dynamic immediately creates an imbalance of power and challenges the very nature of a partnership. Nevertheless, in the present study, a professional development plus coaching model was adopted as a best practice for facilitating practice change.

Practice-based research is a powerful tool in minimizing the gap that frequently exists between academic research and clinical practice. This gap is bridged by developing research questions in clinical practice through partnerships with clinicians in the field (Westfall et al., 2007) to accelerate the adoption of new evidence back into practice (Robinson et al., 2020). This research approach has been seen in a variety of fields, including, but certainly not limited to, speech language pathology (Crooke & Olswang, 2015). According to Vollebregt et al. (2021), practice-based research projects focus on creating practice, capturing practice, or changing practice. A project aimed at capturing practice involves collecting evidence to evaluate current or ongoing approaches, which was the case in the current study.

The current study represents a practice-based research project focused on the evaluation of an ongoing tier one language and literacy program implemented in grade one classrooms. In this program, SLP-educator partners participated in professional development sessions, focused on implementing a structured literacy approach in the classroom, at three points over the school year. In between sessions, SLP-educator pairs engaged in planning, reciprocal coaching and co-instruction to support classroom implementation of the program. The purpose of this research project was to evaluate the effectiveness of this program. Specifically, we were interested in whether improvements

would be seen in student literacy outcomes, as well as SLP and educator knowledge and self-perceptions of assessment and instruction abilities.

3.2 Methods

3.2.1 Participants

Educator/SLP Participants. A total of 16 classroom educators and 15 SLPs agreed to participate in the evaluation of the Grade One Language and Literacy Project. These participants were a subset of a larger group of educators and SLPs required, by the schoolboard, to participate in the project (but not the research study). Participants provided informed consent to participate in the study but not all participants chose to complete all study components.

Student Participants. During the 2018/2019 school year, 380 students participated in the grade 1 language and literacy project. The vast majority of these participants were grade one students; however a small number of grade two students were included in the study as a result of being part of a split grade one-two class. The 380 participating students were nested within 20 separate classrooms, across the regional school board. The data collected from these students were shared anonymously with researchers—therefore a negative consent process was employed. As part of this process, parents were asked to indicate to their classroom teachers if they did not wish to have their child's data anonymously forwarded to the researchers. No negative consents were received, so all student data collected was included in the current data set. Complete data sets were received for 295 students. An additional 52 students were missing a single measure, 17 students were missing 2-4 measures and 16 students were missing 5 or more measures.

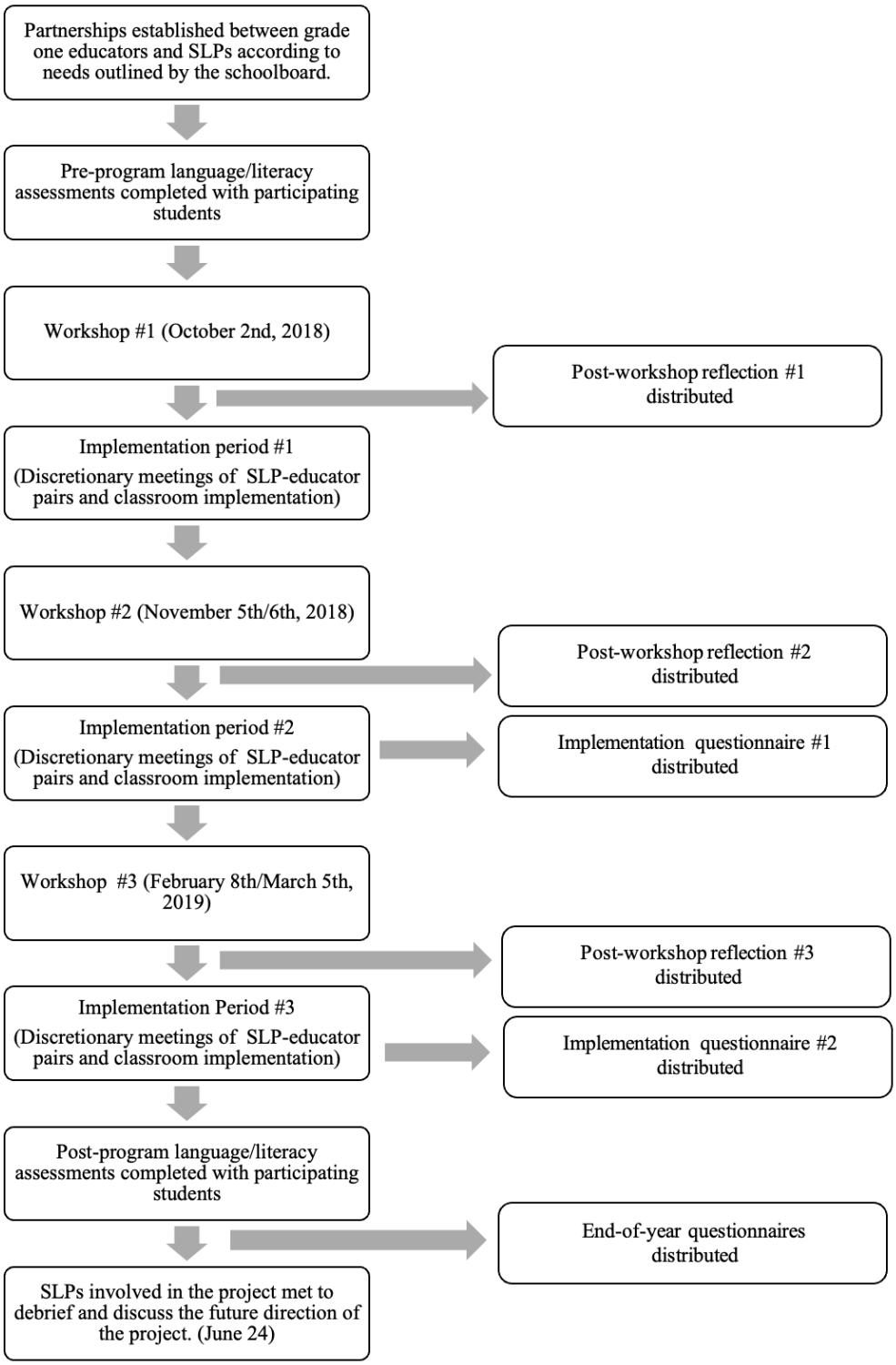
3.2.2 The Grade One Language and Literacy Project Program Description

This intervention program involved three single-day, whole-group, professional development workshops with implementation periods in between and followed by a debriefing session with the SLP group. The second two workshops were offered on separate days at two different locations, to accommodate all participants. Workshop 1

(October 2nd, 2018) focused on targeted assessment, utilizing assessment results and incorporating decodable texts in language and literacy instruction. Workshop 2 (November 5th and November 6th) focused on planning evidence-based language and literacy lessons involving the five key components of effective reading instruction: phonological awareness, phonics, reading fluency, vocabulary and text comprehension. Workshop 3 (February 8th and March 5th) focused on continuing to implement evidence-based instruction and future steps in language and literacy instruction. Between these three professional development sessions, implementation periods occurred. During these implementation periods, SLP-educator pairs met to review the concepts covered during the professional development sessions and to plan for implementation in their shared project classrooms. These implementation periods were entirely driven by the needs of each grade one classroom and by the nature/dynamics of each partnership. Partners were encouraged to select a strategy from the professional development sessions and to work collaboratively to implement that strategy in their shared classroom. Given the importance of continuous coaching to allow for in-the-field fine-tuning of skills and knowledge (Markusson-Brown et al., 2017), SLP-educator pairs were challenged to engage in reciprocal coaching, collaborative planning and co-instruction throughout the implementation periods. Although the goal of the project was to have the SLP-educator pairs spend one half-day per week working collaboratively, the specifics of implementation were at the discretion of each pair. Student language/literacy achievement measures were collected pre- and post-program (at the beginning and end of the school year) by the pairs. A timeline of the project is outlined in Figure 3.2.

Figure 3.2

Timeline of the Grade One Language and Literacy Project



3.2.3 Outcome Measures

3.2.3.1 SLP and Educator Questionnaires

a) Pre- and post-program knowledge and confidence questionnaires were distributed to all SLP and educator participants at the beginning of the first professional development session and at the end of the academic year. These questionnaires were designed to assess a) pre- and post-program knowledge regarding a variety of language and literacy concepts (e.g., counting speech sounds, phonological awareness tasks, definitions, etc.) and b) pre- and post-program self-perceived expertise/confidence in various areas of language and literacy instruction (e.g., phonemic awareness/phonics/vocabulary instruction, assessments, etc.). The knowledge portion of the questionnaires involved 15 multiple-choice questions. The confidence portion of the questionnaires involved 8 questions on which participants rated their confidence on a 5-point Likert scale ranging from 1 (indicating that one considers him/herself a novice) to 5 (indicating that one considers him/herself an expert). Additionally, the post-program questionnaire was designed to evaluate participants' perceptions of, and participation in, the grade one language and literacy project overall with 10 program-reviewing questions. Questionnaires were individualized for classroom educators versus SLPs.

b) During the second and third implementation periods, implementation questionnaires were distributed to the SLP and educator participants. These questionnaires were designed to assess the specifics of strategy implementation following professional development sessions. This questionnaire included 4 questions relevant to the current study and included 1) recalling the strategies that they had planned to implement following the previous PD session, 2) rating how easy they felt it had been, during the implementation period, to implement this/these strategies on a continuous scale from 0 (indicating very easy) to 100 (indicating very challenging), 3) rating how frequently they had used this/these strategies from a) once per week, b) more than once per week, c) one per day, or d) more than once per day and 4) rating with whom they used this/these strategies from a) just a few students or b) all students.

3.2.3.2 Student Language and Literacy Measures

Educators and SLPs involved in the grade one language and literacy project administered a language and literacy assessment to each student in their class at the beginning and end of the school year (with the exception of the Developmental Reading Assessment which was, in some cases, administered halfway through the year as well). This assessment was informed by the simple view of reading and the five pillars of reading instruction outlined by the National Reading Panel in 2000. This language and literacy assessment included measures of phonological awareness, measures of word reading ability, a composite reading measure and a measure of oral language. No measure of vocabulary was administered as part of this assessment. This battery included:

a) Phonological awareness – measures of phonological awareness included: The phonemic blending and phonemic segmenting subtests of the Phonological Awareness Skills Screener.

b) Word reading—measures of word reading included one measure of phonics (The Quick Phonics Screener 3) and one measure of word reading automaticity (The Clay Observation Survey Word Identification Task).

c) Composite reading measure – word reading accuracy, fluency, and text comprehension were measured using the Developmental Reading Assessment 2 (i.e., just 1 score).

d) Oral language – oral language development was measured using the Redmond Sentence Recall task.

The Phonological Awareness Skills Screener *(PASS;* Mather, 2001). This task is designed for students in kindergarten through second grade and assesses a variety of phonological awareness skills including phonemic blending and phonemic segmenting. The phonemic blending task involves the slow presentation of ten sets of phonemes that the child must blend together to create a word. The phonemic segmenting task involves

the child using blocks to identify all the phonemes in a set of 10 words. Both the phonemic blending and phonemic segmenting subtests each result in a score out of 10.

The Quick Phonics Screener 3 (QPS 3*;* Hasbrouck, 2017*).* This task is designed for students in kindergarten through sixth grade and evaluates phonics and decoding skills. This screener evaluates student ability in a series of tasks increasing in difficulty (from recognizing single letter names/sounds to decoding 4-syllable words). During the current project, just a subset of letter names and letter sounds were tested for a total possible score of 31.

The Clay Observation Survey Word Identification Task (Clay, 2016). This task is designed for students in kindergarten through first grade and tests automaticity of word reading. This task employs a series of common sight words and provides a score out of 100. Only 50 sight words from the task were employed during the current project for a total score out of 50.

The Developmental Reading Assessment 2 *(DRA2*; Beaver & Carter, 2006). The DRA2 is an individually administered assessment of a child's reading capabilities. It considers the child's reading accuracy, fluency, phrasing and comprehension. The assessment involves 5 steps: 1) the student reads though the text to become familiar with the story, 2) the student's oral reading rate is calculated as they read, 3) the evaluator keeps a running record as the child reads (including timing), 4) the student reads the story again silently and 5) the student retells the story to the evaluator who evaluates the retell according to a provided scoring manual. A child's accuracy score is based on the percentage of words they read correctly, their fluency rate is determined by the number of words read per minute and their phrasing (reading of larger, meaningful phrases as opposed to slowly reading word-by-word) and retelling scores are given a score of 1-4 based on a provided scoring rubric. Following their retell, children answer a series of comprehension questions which become increasingly more challenging as they progress through the DRA levels (e.g., connecting the story to a real-life event, stating a favourite part of the story, naming the most important events, stating the author's message, describing characters, making predictions, etc.). At higher levels, students may be asked

to write their comprehension responses. DRA2 is commonly completed by classroom teachers 1-2 times per academic year to track a child's reading development. The DRA2 assigns the child a composite score, or reading level, from 0 to 40 (with 0 corresponding to a pre-reading level and 40 corresponding to a fourth grade reading level).

Redmond Sentence Recall (Redmond, 2005). This task is designed for children ages 5-9 years and requires students to listen to and repeat each of 16 sentences. Sentences are 9 to 12 words in length, and repetitions are scored as correct (2), having less than or equal to 3 errors (1) or four or more errors (0) for a maximum score of 32. This task has been found to be highly sensitive to oral language difficulties (Archibald & Joanisse, 2009).

3.2.3.3 Data Analysis

The primary aim of this project was to investigate changes that occurred, as a result of implementing the grade one language and literacy project, in SLP and educator participants. The monitoring of student outcomes served the secondary purpose of assuring that positive changes did occur over the course of the project. Provided sufficient data were available, parametric comparisons using paired samples t-tests were planned for examining group-level change in professional knowledge and student performance. Additionally, normative data (benchmarks) were available for the DRA2 which allowed for direct comparison with student participants' performance in this study. In cases when the sample size was too small for statistical comparison (i.e., SLP and educator participants), aggregate data could only be described.

To assess individual change, reliable change index (RCI) scores were calculated to identify what proportion of students demonstrated true and reliable change across the school year. An RCI cutoff score of 1.645 (indicating a 90^{th} percentile confidence interval) was employed as recommended by Estrada et al. (2018) for single group pre-post test designs. Thus, the number of students who demonstrated change estimated with 90% confidence for the various assessment measures used reflected the change proportion that was true, reliable and not explained by random fluctuations or measurement errors.

3.3 Results

3.3.1 SLP/Educator Measures

Pre- and Post-Program Knowledge and Confidence Questionnaires. The knowledge portion of the pre- and post-program questionnaires was designed to assess participants' understanding of a variety of language and literacy concepts before and after participating in the grade one language and literacy project. The confidence portion of the pre- and post-program questionnaires was designed to assess self-perceived expertise/confidence in various areas of language and literacy instruction. Only 3 (of 16) educator and 7 (of 15) SLP participants completed both the knowledge and confidence portions of the questionnaire at pre- and post-program to allow for comparison. An additional 4 educator participants and 5 SLP participants completed only the post-program questionnaire. At pre-program administration, the questionnaire revealed an average knowledge accuracy score of 62.1% in educator participants (n = 3) and 98.1% in SLP participants (n = 7). At post-program administration, average accuracy scores were 69.0% for educator participants and 98.1% for SLP participants indicating a small increase in language/literacy concept knowledge among educator participants and no change among SLP participants. Given the small sample size, no further analyses could be completed. At pre-program, SLP participants (n = 7) rated themselves, on average, 3.7 on the Likert scale indicating that most participants viewed themselves as falling between "knowledgeable" and "very knowledgeable" (scores ranged from 1-5). By the end of the program these same 7 participants rated themselves an average of 4.0 indicating that most participants saw themselves as "very knowledgeable". Several additional SLP participants provided post-program confidence ratings (n = 5). With these additional participants, the average confidence ratings of SLP participants remained a 4.0 (again, ratings ranged from 1-5). Pre-program, educator participants (n = 3) provided an average confidence rating of 2.8 indicating that most participants viewed themselves as falling between "somewhat knowledgeable" and "knowledgeable" (ratings ranged from 2-4). By the end of the program these same 3 participants rated themselves an average of 3.2 indicating they considered themselves to be "knowledgeable". Again, several additional educator participants provided post-program confidence ratings (n = 4). With these

additional participants, the average confidence ratings of educator participants increased minimally to an average of 3.3 (again, ratings ranged from 2-4). Due to the very small sample of participants who completed these pre- and post-intervention surveys, no further analyses could be conducted. Nevertheless, marginal changes in both knowledge and confidence can be seen following participation in the grade one language and literacy project.

Implementation Periods Questionnaires. During the second implementation period (after workshop 2) SLP (n = 6) and educator (n = 4) participants completed the implementation period questionnaire at the half-way point between workshop 2 and 3. The average rating on the 0 (very easy) to 100 (very challenging) scale for ease of implementation was 43.5 (ratings ranged from 15 to 91) for SLP participants and 35 (ratings ranged from 19 to 51) for educator participants. During this implementation period, 80% of participants reported implementing the selected strategies with “all students” while 20% reported using the selected strategies with “just a few students”. When asked to describe the frequency of their strategy implementation 4/9 participants reported using their selected strategies “once per week”, 2/9 participants reported “more than once per week”, 2/9 participants reported “once per day” and 1/9 participants reported using their strategies “more than once per day”.

During the third implementation period (after workshop 3) SLP (n = 5) and educator (n = 2) participants completed the implementation period questionnaire at the half-way point between workshop 3 and the end of the project. The average rating on the ease of implementation scale was 53.2 (ratings ranged from 20 to 86) for SLP participants and 10 (two ratings of 10) for educator participants. During this third implementation period, 57% of participants reported implementing the selected strategies with “all students” while 43% reported using the selected strategies with “just a few students”. When asked to again describe the frequency of their strategy implementation 5/7 participants reported using their selected strategies “once per week”, 1/7 participants reported “more than once per week” and 1/7 participants reported using their strategies “more than once per day”.

3.3.2 Student Language and Literacy Measures

Results of the language and literacy measures completed by the student participants are displayed in Table 3.1. Significant changes were seen from pre- to post-intervention on all measures. Additionally, the percentage of participants who demonstrated true and reliable change according to a 90th percentile confidence interval is reported (ranging from 23% to 57% of participants across measures).

Table 3.1

Language and Literacy Test Results from Pre- to Post- Intervention

Measure	*n*=	Fall		Spring		*t*(x)	*p*	Cohen's d	Average Change	Proportion RCI >1.645
		M	*SD*	*M*	*SD*					
Phonemic Awareness:										
PASS - *Phonemic Blending*	364	5.30	3.37	8.20	2.45	*t* (363) = 21.6	<.001	1.13	2.90 points	25% (*n* = 92)
PASS – *Phonemic Segmenting*	364	2.98	2.89	5.95	2.81	*t* (363) = 22.2	<.001	1.16	2.97 points	26% (*n* = 93)
Word Reading:										
QPS 3	365	21.90	10.53	27.90	9.06	*t* (364) = 20.1	<.001	1.05	6.02 points	23% (*n* = 84)
Clay Observation Word ID Task	327	19.40	15.7	31.4	14.6	*t* (326) = 24.70	<.001	1.37	12.01 points	33% (*n* = 108)
Composite Reading Measure:										
DRA2	338	6.99	7.20	17.42	8.99	*t* (337) = 33.10	<.001	1.80	10.44 levels	57% (*n* = 193)
Oral Language:										
Redmond Sentence Recall	359	14.7	8.28	19.2	8.28	*t* (358) = 21.80	<.001	1.15	4.52 points	28% (*n* = 100)

Note. – PASS = The Phonological Awareness Skills Screener; QPS 3 = The Quick Phonics Screener 3; ID = Identification; DRA2 = The Developmental Reading Assessment 2.

Phonological Awareness Measures:

Phonemic Blending. Of participants, a total of 2% (*n* = 6) exhibited a negative change in their scores pre- to post-intervention, 16% (*n* = 60) exhibited scores that remained exactly the same (i.e., no change) and 82% (*n* = 298) exhibited a positive change in their scores from pre- to post-intervention. Of the positive changers, 25% (*n* = 92) demonstrated a true and reliable change, from pre- to post-intervention, according to their RCI scores.

Phonemic Segmenting. Of participants, 6% (*N* = 21) exhibited a negative change in their scores pre- to post-intervention, 12% (*N* = 45) exhibited no change in their scores and 82% (*N* = 298) exhibited a positive change in their scores from pre- to post-intervention. Of these positive changers, 26% (*n* = 93) demonstrated a true and reliable change, from pre- to post-intervention, according to their RCI scores.

Word Reading Measures:

The Quick Phonics Screener 3. Of participants, 4% (*N* = 13) exhibited a negative change in their scores pre- to post-intervention, 8% (*N* = 30) exhibited no change in their scores and 88% (*N* = 322) exhibited a positive change in their scores from pre- to post-intervention. Of these positive changers, 23% (*n* = 84) demonstrated a true and reliable change, from pre- to post-intervention, according to their RCI scores.

The Clay Observation Survey Word Identification Task. Of participants, 1% (*N* = 4) exhibited a negative change in their scores pre- to post-intervention, 6% (*N* = 21) exhibited no change in their scores and 93% (*N* = 302) exhibited a positive change in their scores from pre- to post-intervention. Of these positive changers, 33% (*n* = 108) demonstrated a true and reliable change, from pre- to post-intervention, according to their RCI scores.

Composite Reading Measure:

The Developmental Reading Assessment 2 (DRA-2). To be considered proficient readers, grade one students are expected to be reading at a level 3 in the fall of first grade and a reading level of 16 by the spring of first grade. Therefore, the change that is

expected to occur across the grade one year is a change of 13 reading levels. The average DRA-2 change score, across the 338 students who completed pre- and post-intervention tests, was an increase of 10.44 reading levels across the school year suggesting the overall change that occurred across the year was less than expected. Of participants, 1% (*n* = 3) exhibited a negative change in their scores pre- to post-intervention, 3% (*n* = 12) exhibited no change in their scores and 96% (*n* = 324) exhibited a positive change in their reading scores from pre- to post-intervention. Of those students who demonstrated an increase in their pre- to post- scores, 51% (*n* = 165) demonstrated a change score greater than the average of 10.44 reading level increase across the school year and 36% (*n* = 123) demonstrated a change score equal to or greater than the expected change of 13 reading levels. Of these positive changers, 57% (*n* = 193) demonstrated a true and reliable change, from pre- to post-intervention, according to their RCI scores.

The DRA-2 guidelines indicate that by the end of grade 1 students are expected to achieve a reading level of 16 or higher to indicate proficiency. Students exhibiting a reading level of 10 or lower would be identified as having a significant reading deficiency. Of the 339 students that completed the DRA-2 assessment during the spring assessment period, 62% of students (*n* = 211) achieved a reading level of 16 or higher indicating proficient reading at the end of grade 1. During this assessment period, 24% (*n* = 82) of students achieved a reading level of 10 or lower indicating a significant reading deficiency at the end of first grade.

Oral Language Measure:

Redmond Sentence Recall. The average change score across the 359 students who completed this task was an increase of 4.52 points across the school year. Of participants, 9% (*n* = 31) exhibited a negative change in their scores pre- to post-intervention, 6% (*n* = 20) exhibited no change in their scores and 86% (*n* = 307) exhibited a positive change in their scores from pre- to post-intervention. Of those students who demonstrated an increase in their pre- to post- scores, 56% (*n* = 173) demonstrated a larger change score than the average of 4.52 points across the school year. Of these students, 28% (*n* = 100)

demonstrated a true and reliable change, from pre- to post-intervention, according to their RCI scores.

3.4 Discussion

The grade one language and literacy project was a practice-based research project involving SLP-educator partnerships mutually participating in professional development sessions focused on implementing an explicit and systematic structured literacy approach in select grade one classrooms in a schoolboard in Ontario. This project employed 'high-leverage' intervention for the general classroom, focusing on the five key components of effective reading instruction identified by the National Reading Panel (2000), with the overarching goal of improving grade one language and literacy outcomes. The purpose of our partnership with this schoolboard was to evaluate the effectiveness of this program. Overall, marginal increases in educator/SLP knowledge and confidence were seen following the implementation of this program. Additionally, the early-years students participating in this project exhibited significant improvement on all language and literacy measures tested as part of a pre- and post-intervention assessment battery.

Overall, it was challenging to gauge the knowledge and confidence growth of educator and SLP participants, resulting from project participation, due to very small sample sizes. Although marginal changes were seen across measures of competency and confidence (with the exception of SLP competency which was already very high pre-program), with so few participants, it is difficult to attribute these changes to the project or to generalize these findings. Overall, educator participants demonstrated an increase in knowledge scores of 7% from pre- to post-program (from 62% to 69% accuracy) while SLP participants began and finished the program at ceiling (98.1% accuracy). This result may suggest that this knowledge questionnaire covered content familiar to SLP participants and less familiar to educator participants. Additionally, it is worth considering that those who chose to complete these questionnaires were likely the most motivated of all participants and therefore these results may not be representative of knowledge across all participating professionals. In terms of confidence ratings, SLPs were more confident in their language and literacy concept knowledge both pre- and

post-intervention when compared to educator participants—likely corresponding to their higher level of language/literacy knowledge. Educator participants showed more growth in confidence (an increase of 0.5 Likert scale points) over the course of the project but still demonstrated less confidence at the end of the project (3.3 on the Likert scale) than their SLP counterparts reported at the beginning of the project (3.7 on the Likert scale). Taken together, these results suggest that the language and literacy concepts covered as part of this project were more difficult to learn, and work with, for educators compared to SLPs. This result is not particularly surprising considering that some language and literacy topics taught during this project, and assessed in the pre- and post-program questionnaires, are likely already familiar to SLPs (e.g., phonemic awareness). This difference in knowledge was demonstrated in 2008 when Spencer et al. compared phonemic awareness instruction knowledge of several groups including SLPs, classroom educators and specialized educators. They found that SLPs demonstrated superior performance, in terms of phonemic awareness skills than all other educators (Spencer et al., 2008). This potential difference in knowledge between SLPs and educators may have extended to other areas of language and literacy instruction—many of which were taught and used throughout the grade one language and literacy project.

Although the small sample size in the present study precluded the analysis of links between knowledge gains and strategy implementation, the lack of marked observed change in SLP or educator knowledge in the present does not necessarily mean there was a corresponding reduction in implementation. Indeed, Scarinci et al. (2014) reported an increase in early child educator knowledge and confidence, but not in strategy implementation, following SLP-led in-service education. Alternatively, Neuman and Wright (2010) found that after providing a professional development opportunity, aimed at improving prekindergarten teachers' early language and literacy practices, through in-the-field coaching, educators demonstrated only modest increases in knowledge regarding early language and literacy development but did show significant improvements in implementation post-intervention in terms of the structural features of their provided language and literacy environments (Neuman & Wright, 2010). Combined, these two studies may suggest that changes in knowledge and changes in practice may not be dependent on one another.

Educator and SLP participant ratings regarding the ease of strategy implementation during this project revealed that participants found the project to be moderately easy to implement (with an average rating of 40/100). However, it is worth noting that this rating of ease of implementation did not change over the course of the project as may have been expected. Following participants' attendance of more PD sessions, and engagement in more reciprocal coaching and collaborative planning/teaching between pairs, it is reasonable to assume that the project would have felt less challenging to implement. However, greater ease of implementation as the project unfolded was not observed. This may have been due to the fact that new strategies were taught throughout the year (during the professional development sessions). Although, it was assumed that newly learned strategies would build upon previous learning, that may not have reflected the lived experiences of the participants. Perhaps instead, the presentation of new strategies throughout the year meant continuous learning and effort were required. In a 2012 study by Starling et al., educators' modifications to their oral and written instructional language were monitored following training of a series of techniques provided by SLPs. Although overall there was a significant increase in use of these language modification techniques following this training, there were still teachers who only reached what was referred to as "mechanical use" of these techniques (according to the Concerns-Based Adoption Model created by Hord et al. in 2006). Mechanical use indicated that the educator was focusing most effort on the day-to-day use of these strategies with very little time for reflection and was still directing effort towards mastering the skills required to implement said strategies. Mechanical use of strategies, according to this model, suggests that effort and thought are still required during implementation and may accurately reflect how strategies were being used by participants throughout the current study.

Responding educator/SLP participants also shared quite varied responses regarding how often, and with how many students, they were implementing their learned strategies. These responses varied both between participants and between implementation periods reflecting the fluid nature of this project. It is possible that participants implemented learned strategies in response to the specific needs demonstrated by the students in their classrooms.

When investigating the changes in the language/literacy abilities of the students in grade one language and literacy project classrooms, significant improvements in performance were seen across the entire battery of student assessments. These changes are consistent with the idea that the grade one language and literacy project was successful in improving early years language and literacy outcomes in a range of areas. However, it is important to note that, changes in these language and literacy measures are to be expected over the course of the grade one year. The DRA2 test was developed as a teacher-administered assessment used to identify students' instructional reading levels, their strengths and weaknesses in reading and their progress in reading over time (McCarthy & Christ, 2010). As such, it is seen in education as an important tool for gauging classroom reading instruction. In the current study, student results on post-intervention DRA2 assessments (i.e., 62% of students achieving scores indicating proficiency in reading) suggest a strong student response to the grade one language and literacy project. Additionally, according to RCI scores on these DRA2 assessments, 57% of students demonstrated a true and reliable change, from pre- to post-intervention. Of the other language and literacy assessment measures employed during this project, RCI scores were calculated to evaluate sample change at the level of the individual and reliable changes were observed for approximately one quarter to one third of students (ranging from 23% to 33% across measures).

3.4.1 Limitations

Data Completeness. Much of the data collected, during this project, from the participating educators and SLPs was incomplete. Very few participants completed all of the questionnaires that were sent to them over the course of the 2018/2019 school year. Many participants felt overwhelmed by the investment of time that the grade one language and literacy project required (see chapter 2 for a more detailed description of how time acted as a barrier to project implementation) and, as a result, it is likely that some participants may have felt that they could not devote any extra time to completing the questionnaires associated with our program evaluation of the project. The very small sample size of participating educators and SLPs makes drawing conclusions regarding their learning, growth and implementation, over the course of this project, challenging.

Although marginal improvements were seen in most cases, generalization of these trends are difficult to make.

Control Group. It was our intention to recruit a control group of students to complete this assessment battery at the beginning and end of the 2019/2020 school year to allow for a direct comparison between students who participated in the grade one language and literacy project and those who received standard language and literacy instruction. These data would have allowed us to compare the change scores of students who had participated in the grade one language and literacy project to those who experienced classic language/literacy instruction. Unfortunately, due to educator job action in Ontario (2019) and the COVID-19 pandemic (2020—2021), we were unable to collect these data. In the future, it would be worthwhile to collect this set of data to allow for a direct comparison between groups and to account for developmental growth of students during their first-grade year.

Practice-Based Research. As a practice-based research project, the present study afforded the opportunity to capture practice as it unfolded. However, a number of details remained out of the control of the researchers. A concurrent control group could not be recruited, those involved in the study were recruited from a group who had been assigned to complete the project (rather than volunteered), and study measures were added to an already busy learning context. As well, the assessment measures were chosen to fit the project context (i.e., ease and time of administration) and did not fully cover all concepts of interest (e.g., vocabulary). There are a vast number of benefits to practice-based research including the fact that because the project was created by clinicians in the field, rather than being imposed on them by researchers, the likelihood of uptake and successful implementation was higher. However, practice-based research is also challenging in that, from a research standpoint, the level of control and rigor necessary to draw strong and generalizable conclusions can be difficult to achieve.

3.5 Conclusions

The current practice-based research project focused on the evaluation of an ongoing tier one language and literacy program implemented in first grade classrooms. In this program, SLP and educator partners were engaged in three professional development sessions focused on strategies for implementing a structured literacy approach in their assigned classroom. In between sessions, these pairs engaged in planning, reciprocal coaching and co-instruction to support classroom implementation of the program. Across the school year, in a small subset of the study sample, minimal improvements in SLP and educator knowledge and confidence were seen. Participants also reported that the project was moderately easy to implement and that this ease of implementation remained consistent across the school year. Finally, significant improvements in grade one language and literacy outcomes were seen on measures of phonological awareness, word reading, a composite reading measure and oral language –all areas that aligned with the five pillars of reading instruction outlined by the National Reading Panel in 2000. Overall, small improvements in SLP/educator knowledge and confidence and significant improvements in grade one language and literacy assessment measures were observed following participation in the grade one language and literacy project. Notably, these changes occurred while participants were engaged in the project but may not have been a result of the project.

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Chapter 4

4 Identifying and describing developmental language disorder (DLD) in children

4.1 Introduction

Current estimates indicate that just over 7% of children have a persistent language disorder that impacts their learning and/or social interactions (Norbury et al., 2016; Tomblin et al., 1997). Until 2017, there was no agreement regarding how to appropriately label these children with unexplained language problems (Bishop, 2014). This issue was addressed with the publication of the 'CATALISE' studies (Bishop et al., 2016, 2017), which recommended criteria and terminology for children's language impairments based on a consensus by an international panel of 59 experts representing ten different disciplines (e.g., education, psychology, speech-language pathology, paediatric medicine and child psychiatry) and 6 different countries (i.e., Australia, Canada, Ireland, New Zealand, United Kingdom and the USA). It was agreed that the term "developmental language disorder" (DLD) should be used to describe children with,

> "language difficulties that create obstacles to communication or learning in everyday life that are unlikely to resolve by five years of age and are not associated with any known biomedical condition such as brain injury, neurodegenerative conditions, genetic conditions or chromosome disorders such as Down Syndrome, sensorineural hearing loss, Autism Spectrum Disorder or Intellectual Disability" (Bishop et al., 2017).

In other words, DLD is a persistent language disorder of unknown etiology that has a functional impact on everyday social interactions or learning. Although the CATALISE studies described diagnostic criteria for DLD, no prescriptive formula for when to apply the label was provided. Rather, DLD was described as a heterogeneous category encompassing a wide range of language problems requiring the combination of multiple sources of information to inform a diagnostic decision. The present study employs a case study approach to investigate how clinicians use various assessment results to inform

DLD diagnosis. The purpose of the study is to gain a greater understanding of these complex diagnostic decisions and to examine the extent of agreement in these judgements across clinicians.

Diagnosis is the process of identifying a disorder or condition based on its signs and symptoms as revealed in various assessment procedures. Diagnosis is a complex, client-centred and collaborative activity that involves information gathering and clinical reasoning (National Academies of Sciences, Engineering, and Medicine, 2015). When a diagnosis is accurate and timely, the affected individual has the best opportunity for positive outcomes. With regards to DLD, there are several factors that make the diagnostic process challenging. By definition, DLD involves identifying atypical or impaired language development, but there is no specific and identifiable point distinguishing impaired functioning from the low end of normal variation (Bishop et al., 2016). Language is, by nature, complex and multifaceted. As a result, language development is both individually variable and influenced by a number of factors (e.g., bilingualism; co-morbid disorders), all of which must be considered in the diagnostic process. Additionally, there are undeniable challenges in effectively assessing DLD (e.g., tool selection, cutoff scores used). Given this complex picture, DLD diagnosis is clearly a 'top of the license' activity for speech-language pathologists (SLPs). The importance of clinical reasoning and clinical judgement in this process cannot be underestimated. By using a case-based approach to understanding how these diagnostic judgements are made, we hope to illuminate the clinical reasoning involved in DLD diagnosis and contribute to increased confidence and consistency in the diagnostic process moving forward.

The CATALISE studies (Bishop et al., 2016, 2017) offered no further subtypes of DLD based on findings from years of research, which have failed to identify consistent subtypes (Bishop et al., 2000a; Bishop et al., 2000b; Conti-Ramsden et al., 1997) or yield clarity in patterns of individual differences (Leonard, 2014). Traditionally, the only distinction adopted by the field involved that of language modality and led to differentiation between expressive, receptive and mixed receptive-expressive disorders—corresponding to problems principally involving language output, language comprehension or both output and comprehension, respectively. These distinctions were

given diagnostic formality in both the *Diagnostic and Statistical Manual of Mental Disorders—4th Edition* (American Psychiatric Association, 2000) which recognized 'expressive language disorder' versus '(mixed) receptive-expressive language disorder' as well as the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (World Health Organization, 2005) which recognized 'expressive language disorder' versus 'receptive language disorder'. Clinically, many standardized language assessments, currently used by SLPs in practice, generate separate scores for expressive versus receptive language (e.g., the Clinical Evaluation of Language Fundamentals – 5th Edition). One motivation for this expressive-receptive distinction comes from evidence suggesting that disorders involving receptive language are more likely to exhibit pronounced long-term impacts on language and/or social development (Stothard et al., 1998; Johnson et al., 1999; Clegg et al., 2005) and may respond less favourably to intervention (Boyle et al., 2010) compared to expressive disorders. More recent studies of the dimensionality of language, however, have not provided support for a receptive – expressive distinction in language performance (Tomblin & Zhang, 2006; Leonard, 2009). In the most recent 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), the expressive and receptive subtypes have been removed entirely and only the category 'language disorder' is retained (American Psychiatric Association, 2013). DLD is largely consistent with the DSM-5's 'language disorder' category, although DLD is narrower in that it does not apply to individuals with a language disorder associated with a known biomedical condition. Even though a diagnostic distinction between receptive and expressive disorders is not recommended, it remains true that receptive language status is a prognostic indicator (Beitchman et al., 1996; Clark et al., 2007). Therefore, it remains likely that clinicians still use the presence or severity of receptive difficulties as a strong indicator of DLD. We investigated this hypothesis in our case studies by varying the expressive – receptive profiles across the various cases.

4.1.1 The Variability of DLD

DLD is notably heterogeneous. One primary source of variability in DLD is the multifaceted nature of language. Because previous attempts to classify DLD subtypes

have been unsuccessful, the CATALISE panel members opted instead to outline the principal areas of language that might be impaired in DLD. These areas of language difficulty included phonology, syntax, word finding and semantics, pragmatics/language use, discourse, and verbal learning memory (Bishop et al., 2017). In DLD, evidence suggests that difficulties can arise in any or all of these language areas. However, the specific area/areas of language functioning in which a child is impaired may influence their overall prognosis and therefore also influence diagnostic decision making. Generally, the greater the number of language areas that are impaired, the greater the likelihood of these problems persisting beyond preschool and into school age (Bishop & Edmundson, 1987). Then, if a child is still experiencing language problems at school age (over 5 years), there is a greater likelihood of those language problems persisting (Stothard et al., 1998). A greater number of areas of impairment, possibly in combination with a child's age, may increase a clinician's likelihood of providing a label of DLD. It is also true that preschool children experiencing difficulty in language functioning restricted to their expressive phonology have generally good prognoses (Bishop & Edmundson, 1987). The specific area of language functioning difficulty experienced by a child may also influence a clinician's diagnostic decision. Challenges with pragmatics, or language use, can also complicate an SLP's diagnostic process. Children with DLD may exhibit immature pragmatic skills, or difficulty with figurative language, which may lead to challenges in social interactions (Paul et al., 2018; Norbury, 2004). However, challenges with pragmatic language overlap significantly with other neurodevelopmental disorders such as autism (Baird & Norbury, 2016) and attention deficit hyperactivity disorder (Redmond, 2020). Because of this overlap, it may be true that childhood language profiles involving disproportionate deficits in social communication or pragmatics may result in a clinician being more hesitant in providing a diagnosis of DLD. To address the potential diagnostic challenges posed by these previously mentioned areas, we intentionally varied the areas of language functioning difficulty across case studies in order to examine the consistency with which these challenge areas influenced clinicians' judgements. It is noteworthy to mention that recent research by Lancaster and Camarata (2018) suggests that the most appropriate way to address the heterogeneity of potential language difficulties in DLD is to view DLD as a spectrum disorder, with nonrandom but

highly overlapping trait clusters, rather than a disorder with predictable subtypes or individual differences. Although further work is required in this area, the authors did consider the principal areas of language outlined by Bishop et al. (2017) to be potential DLD traits in this spectrum disorder view.

Another source of variability in DLD is the extent of impact on oral versus written language. A large proportion of children with DLD will also experience difficulty with reading (Bishop, 2014). This difficulty may be born from challenges in learning decoding skills, and thus developing fluent word reading, or in reading comprehension. In fact, approximately 50% of children with DLD also meet the diagnostic criteria for dyslexia as a comorbid condition (McArthur et al., 2000; Adlof & Hogan, 2018). Many children with DLD, struggling with the acquisition of oral language, also experience difficulty in the production of written language (Dockrell & Connelly, 2015). The relative impact of DLD on oral and written language can change over the lifespan, although research looking at these outcomes in adults with DLD is still lacking. It is known that a proportion of children's communication difficulties will resolve (Bishop & Edmunson, 1987) and, although protracted in time, many children with DLD will acquire sufficient oral language skills for everyday interactions. Evidence suggests that candid spoken language errors, like grammatical errors, are more likely to occur when children with DLD are young or when they are faced with more cognitively demanding discourse tasks (Kornev & Balčiūienė, 2021). Older children and adults with DLD may struggle to understand and discuss complex narratives, or intricate conversational topics, and may have difficulty in producing more nuanced sentences (Nippold, 2016). Because conversational language is frequently non-complex in nature, the language difficulties observed in teens or adults with DLD may not be readily apparent in day-to-day conversations. In later childhood and/or adulthood, the language deficits associated with DLD may become more apparent when the individual is faced with the complexities of written material. Individuals with DLD may struggle to understand, and/or produce, complex written language and may demonstrate avoidance of writing tasks (Conti-Ramsden et al., 2018). When looking at the Test of Integrated Language and Literacy Skills (Nelson et al., 2016), for children eight years of age and older, one of four identification core scores used to identify language and literacy disorders involves a measure of written expression. It is possible

that clinicians will rely on written language as an indicator of DLD, particularly in older individuals with DLD.

4.1.2 The Complexity of DLD

Language development and performance are influenced by many factors, which can make it difficult to determine if the presenting difficulties truly represent a disorder. Take, for example, early language development. It is well known that language emerges in young children at different rates. In fact, the results of a large, cohort study entitled The Early Language in Victoria Study (ELVS) revealed that at two years of age, approximately 19% of children were considered 'late talkers' (Reilly et al., 2018) – defined as children who have an expressive vocabulary of fewer than 50 words and no two-word combinations at 24 months of age (Paul, 1991; Rescorla, 1989). Nevertheless, a substantial proportion of the late talkers in this cohort study (approximately 70%) recovered – findings which were in line with several other research studies suggesting that between 50 and 70% of late talkers catch up to their age-matched peers and exhibit normal language development by school age (Paul et al., 1996). Alternatively, some children who are not considered to be late talkers may later be diagnosed with DLD. In fact, the ELVS revealed that approximately 8% of their cohort of children who were considered to have typical language development at two years of age went on to exhibit a low level of language at four years of age (Reilly et al., 2018). Given this clear variability, it can be difficult to determine if the language difficulties observed in very young children are likely to be persistent. However, persistence of the language disorder is part of the specific diagnostic criteria for DLD—of course transient difficulties would not be considered a language disorder. Evidence does suggest, however, that by the time a child is four years of age, we are able to discriminate those who will have a persistent language difficulty with relatively high accuracy (Bishop & Edmundson, 1987). Certainly, in the Bishop et al. CATALISE (2017) study, it was suggested that language problems that are still evident at five years of age are likely to persist (Stothard et al., 1998). Given this information, we can expect clinicians to be reasonably confident in their diagnostic decisions for four- to five-year-old children, and even more confident for

older children. The present study did not address diagnostic decisions in children under 4 years of age.

Another issue that adds complexity to the identification, and thus diagnosis, of DLD is when a child is learning more than one language simultaneously. It can take over three years for children learning the language of instruction (often the majority language), as an additional language, to gain mastery of it (Paradis, 2016). In fact, commonly, groups of children with DLD and groups of children who are culturally/linguistically diverse have been found to score comparably low on standardized language tests presented in English (Paradis, 2005; Windsor & Kohnert, 2004). As a result, in bilinguals, it can be difficult to determine if the observed language difficulties reflect a genuine language problem or simply a lack of exposure to the language under investigation. For culturally and linguistically diverse children, determining the presence of a language disorder within the context of the child's language difference (e.g., when a child speaks in a non-mainstream dialect) can be very challenging and must be approached with care (Bland-Stewart, 2005; Oetting & McDonald, 2001). It is important to note that a language disorder will present in all languages that a child is learning. As a result, if the SLP can rule out a language disorder in any language that a child speaks, then a diagnosis of DLD would not be warranted. It is critical to acknowledge that it can be challenging to complete an assessment in non-majority languages because often the clinician does not speak the non-majority language in question, adequate assessment materials are not available and parental/family reports may be unclear. As a result, we can expect diagnostic decisions to be more complex when involving culturally and linguistically diverse children, with time spent learning the test language and the availability of reliable information on performance to be highly influential.

Impairments in cognitive, sensori-motor, or behavioural domains can additionally influence language functioning. Determining whether language difficulties are secondary to impairments in one of these areas, or due to a potentially co-morbid DLD diagnosis, can be challenging. Take, for example, the attentional problems that are characteristic of attention deficit hyperactivity disorder (ADHD). Lack of attention can result in missing instructions or responding with an off-topic remark, which could potentially be

misidentified as a language difficulty. Children with ADHD have been found to exhibit more frequent and longer mazes, or disruptions to their flow of speech via mechanisms like pauses, repetitions and revisions, than typically developing children and children with language impairments (Redmond, 2004). Children with ADHD may also be at an increased risk for a number of language challenges including delayed onset of first words and word combinations, poor performance on various standardized language measures (e.g., vocabulary, syntax, reading fluency, short term memory), difficulty in producing cohesive narratives and challenges with sentence recall tasks (Stanford & Delage, 2020; Hawkins et al., 2016; Barkley, 1997; Love & Thompson, 1988; Purvis and Tannock, 1997). Research by Camarata and Gibson (1999) has also demonstrated that some key ADHD symptoms (e.g., inattention, distractibility, etc.) can be directly mapped onto deficiencies in pragmatic skills (e.g., turn-taking, conversational repair, etc.), which may also be seen in a child with a language disorder like DLD. While ADHD may have a potentially negative influence on some areas of language, a proportion of children with ADHD have demonstrated comparable abilities to their typically developing peers, as well as superior performance to their peers with a language disorder in areas like tense marking, sentence recall and nonword repetition (Redmond et al., 2011). However, it has been shown that children with comorbid ADHD and language impairment perform considerably poorer than their typically developing peers on these measures and similarly to peers with a language disorder alone (Redmond et al., 2015).

From findings like the aforementioned, we can expect that children with ADHD may exhibit some language differences. Walsh et al. (2013) reported that nearly three-quarters of their study cohort of children with ADHD had previously unrecognized language difficulties. More than 70% of those students had both receptive and expressive language deficits. Overall, estimates for the comorbidity of ADHD and DLD have fluctuated across the literature and according to various diagnostic criteria (Redmond, 2020). It may be challenging for an SLP to determine whether language deficits are biproducts of a neurodevelopmental disorder like ADHD or due to a comorbid DLD. Overall, persistent and marked impairments across several language areas, and in the context of low attentional demands, would be more suggestive of a co-morbid DLD diagnosis. Consensus statement nine from Bishop et al.'s (2017) CATALISE study states

that, “Co-occurring disorders are impairments in cognitive, sensori-motor or behavioural domains that can co-occur with DLD and may affect the pattern of impairment and response to intervention, but whose causal relation to language problems is unclear. These include attentional problems (ADHD), motor problems (developmental coordination disorder), reading and spelling problems (developmental dyslexia), speech problems, limitations of adaptive behaviour and/or behavioural, and emotional disorders”. It is important to recognize that there are a number of other neurodevelopmental diagnoses, like ADHD, that do not preclude a diagnosis of DLD even though they may impact a child’s language, complicate a child’s profile and present a diagnostic challenge for the SLP.

4.1.3 The Assessment of DLD

Challenges in the assessment process likely also contribute to the under-diagnosis and subsequent underservice of children with DLD, which has been observed for over two decades (McGregor, 2020). DLD is a condition in which language competence is different than average. Capturing these impairments can occur in a variety of ways. Many professionals view standardized tests as the best way to assess a child’s language ability and identify deficits (Betz et al., 2013). There is certainly merit to this approach—allowing a direct and concrete comparison between a child’s ability to the average abilities of their peer group. Fulcher-Rood et al. (2018) conducted interviews with 39 school-based SLPs who reported that they relied both on standardized testing and informal testing during their diagnostic procedures. However, standardized test results were reported to be the primary tool driving their diagnostic decision-making and determination of treatment eligibility. This reported reliance on standardized tests begs the question—how are these tests selected for use? Betz et al. (2013) conducted a survey of SLPs investigating how frequently an array of standardized tests were being used in clinical practice. They reported that the most frequently employed tests were omnibus and single-word vocabulary measures and that the psychometric properties of a test did not influence how frequently it was used by professionals (Betz et al., 2013). It is possible that standardized tests are selected for use based on familiarity or newness rather than psychometric quality. In our case studies, we provided no information regarding the

psychometric quality of the tests used to obtain the assessment findings for respective cases.

After test selection, an additional challenge in standardized test use is determining an appropriate cutoff score to abide by when diagnosing. In fact, researchers in the CATALISE studies (Bishop et al., 2016) agreed that there is no clear cut-off that distinguishes language impairment from the lower end of normal variation in language ability. Certainly, there is no single cut-off point that applies universally and across different language tests. Nevertheless, cut-offs to aid in diagnostic decisions are determined in a number of ways. According to the DSM-5, the greatest diagnostic accuracy for Specific Learning Disorder is based on academic skill test results that are at least 1.5 SD below the mean (7th percentile). It is further suggested that a more lenient (and wider) threshold (-1 to -2.5SD) may be used with converging evidence and based on clinical judgment. In the case of DLD, Tomblin et al. (1997) examined cutoff scores in an epidemiological sample of school age children who had undergone a comprehensive language test battery. They found that a standardized cutoff score of –1.25 SD, achieved on at least 2 of 5 language subtests, resulted in language disorder diagnoses that were consistent with clinician ratings (Tomblin et al., 1996). Although some research studies have adopted this -1.25 SD (10th percentile) cut off as criteria for DLD, many others have been reported as using a -1.5 SD (e.g., Dollaghan, 2004; Leonard et al., 2003; Maillart et al., 2004; Wells & Peppe, 2003) or a -1 SD cutoff (Flax et al., 2003; Ford & Milosky, 2003; Paradis et al., 2003). These previously listed research papers reflect only those studies published in the Journals of the American Speech-Language Hearing Association between August 2003 and April 2004 (list compiled by Spaulding et al., 2006) and reflect a greater truth—the cutoff scores used in research to determine the presence, or lack thereof, of a language disorder are notoriously variable.

Once again, it must be emphasized that there is no universally recommended cut-off score. Because of this, there is certainly the potential for discrepancy between an arbitrary cutoff score, used across tests, and the cutoff score associated with impairment on a specific test. This discrepancy could lead to over- or under-identification of a language disorder (Plante & Vance, 1994). Unfortunately, arbitrary cutoff scores are

frequently applied to commercially available tests of language by both researchers and clinicians (Spaulding et al., 2006). Many researchers have now begun to advocate for use of evidence-based cutoff scores that have been psychometrically derived for the test in question as this score will have the highest level of sensitivity and specificity (e.g., Dollaghan, 2004; Rescorla & Alley, 2001; Rice & Wexler, 2001, etc.). To directly investigate whether or not commonly used arbitrary cutoff scores could be used to diagnose language impairments, Spaulding et al. (2006) examined the magnitude of differences between groups with DLD and normative samples across 43 different, commonly used, tests of child language. Their results suggested that the mean group differences reported in many test manuals indicated that children with language impairments frequently score closer to the normative sample's mean than common arbitrary cutoff scores (Spaulding et al., 2006). It is reasonable to assume that scores indicating a milder concern would lead to clinicians being more hesitant to assign a diagnosis of DLD.

Although many SLPs rely on standardized testing in the DLD diagnostic process, standardized tests, on their own, are not sufficient to diagnose DLD. Indeed, Bishop et al. (2016) stressed that multiple sources of information must be combined in assessment. One reason for this is that standardized tests are not always sensitive to the language problems experienced by an individual with DLD. Some children with language impairments will score in the average range on commonly used language tests (Spaulding et al., 2006; Spaulding et al., 2012). As well, some language abilities are particularly difficult to capture in a static language assessment. For example, measuring social communication in a standardized way is infamously challenging (Norbury, 2014), as are the functional impacts of a child's deficits. More generally, standardized tests are notoriously biased against children from minority backgrounds (Norbury & Sparks, 2013). Nevertheless, the extent to which clinicians are willing to make a DLD diagnosis in the absence of any standardized assessments is unclear and was examined in two cases included in the present study. Additionally, it is possible that when faced with a child who scores closer to a normative mean, SLPs may be less confident in identifying a disorder and more likely to seek additional information before diagnosis. This possibility

was also explored by investigating SLPs' diagnostic confidence across cases with varying score severities in the present study.

The multiple sources of information outlined by Bishop et al. (2016) to be combined in assessment included interview/questionnaires with parents or caregivers, direct observation of the child, as well as standardized age-normed tests or criterion-based assessments. In fact, there are a wide variety of other measures like language sampling, response to intervention, dynamic assessment, parental report and teacher observation that offer critical insight into the nature and severity of a child's language impairment—insight that is not well-captured by a standardized test. Research has made it clear that converging evidence is important when examining a child's language profile and multiple sources of converging evidence, like those listed here, can be expected to increase a clinician's confidence during the diagnostic process.

It is also very clear that the diagnostic process of DLD requires skill on the part of the SLP assessing to accurately identify deficits and to rule out other disorders that may share common diagnostic features. Three primary factors discussed as challenges to the diagnostic process - variability, complexity and assessment constraints - were echoed in a qualitative investigation conducted by Thomas et al. (2019). This study was aimed at gathering a rich description of SLPs' experiences when diagnosing DLD. The study results drew attention to several important themes. Participants experienced several barriers to early referral including parental misunderstanding and the masking effects of bilingualism (Thomas et al., 2019). Additionally, there were several assessment factors that were challenging including the individual variability of impairments, the appropriate selection of assessment tools and identifying key indicators as well as non-linguistically based difficulties in their clients (Thomas et al., 2019). Overall, Thomas and colleagues concluded more support and improved assessment tools are required to aid SLPs in the DLD diagnostic process. Their in-depth look at SLPs' experiences drew attention to the reality that diagnosing DLD is a complex process with which not all SLPs will be completely comfortable currently.

4.1.4 The Current Research

Immediately following the publication of Bishop et al.'s (2016, 2017) studies, we completed a survey examining the current practices, beliefs, and attitudes towards diagnostic label provision for children with language disorders in a group of 370 English Canadian SLPs (Kuiack & Archibald, 2021). Overall, label use among these SLPs was found to be highly inconsistent. Our results indicated that the majority of SLPs (76%) were at least occasionally applying a specific label to describe children presenting with significant delays in their language. However, despite the recent consensus for the label DLD, our results demonstrated that of all potential labels used to describe these children, the label language delay was reported to be used most frequently while DLD (and even the predecessor specific language impairment) were used least frequently. In fact, of 307 respondents, 26.4% (n = 81) reported that they were unlikely to use the diagnostic label DLD at that time. Encouragingly, respondents indicated an increased likelihood of label provision in their practice if the label was being used by other SLPs. Also, encouragingly, 55.1% (n = 169) of respondents reported feeling that the label DLD was effective and 30.3% (n = 93) strongly agreed with the statement, "children with language disorders would be better off if professionals were consistently using the agreed upon label of DLD". Although, overall, at the time of this study, the label DLD was not being commonly used in practice, there were particular responses that were encouraging for future uptake of the label.

In response to this observed uncertainty regarding use of the DLD label, and clear diagnostic challenges outlined in the literature, a second survey of SLPs was conducted aimed at investigating which types of clinical language profiles, and specific assessment results, were viewed as warranting the diagnostic label DLD. By providing clinicians with the opportunity to review and provide feedback on a variety of carefully constructed case studies that exploited aspects of the diagnostic process identified throughout the literature as being particularly challenging, we sought to develop a deeper understanding of the assessment/diagnostic process for DLD in practice.

We hypothesized that the following variables may increase the likelihood of making a diagnostic decision of DLD:

a) Profiles with *more severe receptive language difficulties*.

b) Profiles with *more converging evidence of language difficulty* (a greater number of language functioning areas impacted).

c) Profiles with *more severe standardized test scores*.

Further, we hypothesized that the following variables would make the diagnostic decision-making process more challenging:

a) Profiles exhibiting *standardized test scores close to the normative sample's mean*.

b) Profiles exhibiting *comorbid diagnoses* (e.g., ADHD, Childhood Apraxia of Speech, behavioural challenges).

c) Profiles indicating that a *child is an English language learner*.

d) Profiles demonstrating *written language difficulty in an older student*.

It was our hope that achieving a deeper level of understanding of the diagnostic process would provide valuable insight into how to build further practice consistency in the provision of the diagnostic label DLD especially in cases of complex language profiles and assessment results.

4.2 Methods

4.2.1 Participants

A total of 243 SLPs working with children with language disorders agreed to complete the online survey, although the number of responses per question varied. The average clinical experience of participants was 14.5 years. Of 224 SLP respondents, 8.5% (n = 19) worked exclusively with 3–5-year-old children, 4.5% (n = 10) worked with 6–13-year-old children, and 0.5% (n = 1) worked with 14–18-year-old children. Additionally,

27.2% (*n* = 61) of the S-LPs worked with children in both younger age categories and 7.1% (*n* = 16) worked with children in both older age categories. The largest proportion of respondents, 52.2% (*n* = 117), worked with children from all three age categories. Of 216 total respondents, 12 different countries were represented in this study including: Australia (*n* = 14), Belgium (*n* = 1), Brazil (*n* = 1), Canada (*n* = 134), India (*n* = 1), Iran (*n* = 1), New Zealand (*n* = 1), Saudi Arabia (*n* = 1), South Africa (*n* = 2), Netherlands (*n* = 1), United Kingdom (*n* = 34) and the United States (*n* = 25). Of 217 respondents, the largest proportion (47.5%, *n* = 103) reported practising in a school board. Another 1.8% (*n* = 4) practiced in a hospital, 2.8% (*n* = 6) in non-residential health care, 13.4% (*n* = 29) in private practice, 8.3% (*n* = 18) in some other location (e.g., preschool speech and language services, a children's treatment centre, a university, etc.) and 26.3% (*n* = 57) in some combination of the aforementioned locations.

4.2.2 Questionnaire

A 61-item questionnaire, available in English, was developed using the online survey platform Qualtrics. Participants were presented with 10 case studies describing various childhood language profiles and assessment results. These 10 case studies were specifically designed, by the authors, to reflect childhood language profiles and test results frequently seen in clinical practice. However, these profiles were also carefully designed to include common complications, and challenges to diagnosis, faced by SLPs in clinical practice. Five case studies were designed to reflect children with DLD, and five case studies were designed to reflect children without DLD. A summary of cases can be seen in Figure 4.1. This figure includes the case number, the age of the child, the intended diagnosis, the symptoms considered consistent with a diagnosis of DLD and factors included that presented a challenge to DLD diagnosis.

Figure 4.1

Summary of Cases

Case #	Age	Diagnosis	Symptoms Consistent with DLD	Challenges to Diagnosis
1	7;2	DLD	-low receptive language score (11th percentile) -low expressive language score (15th percentile) -difficulty forming friendships	-percentile ranks are borderline
2	6;11	DLD	-reported difficulty with narrative language -lack of response to intervention targeting language concepts, storytelling and vocabulary	-informal assessment only for narrative language
3	4;6	DLD	-severe receptive language deficits (2nd percentile) -expressive language deficits (9th percentile) -short ungrammatical sentences	-under 5 years of age -referral for difficulty being understood and mispronunciation of words -speech screening at the 35th percentile
4	5;9	DLD	-immature language -teacher checklist revealed concerns in several language domains -grammatical errors observed during classroom observation	-no formal/standardized language testing
5	12;0	DLD	-older student with severe written language deficits (2nd percentile) -history of preschool speech and language services -deficits on several language subtests (nonword repetition—4th, reading comprehension—6th)	-borderline score on formulating sentences (10th percentile) -low-to-average score on word definitions (28th percentile) -low-average score on recalling sentences (36th percentile)
6	8;4	Not DLD	-confusing narrative retell on first attempt -gaps in vocabulary knowledge	-improvement on narrative retell following coaching -English language learner -no parental concerns regarding home language
7	5;4	Not DLD	-difficulty following classroom instructions	-no formal/standardized testing -improvement following strategy implementation

			-behavioural issues at transition times	
8	5;7	Not DLD	-expressive language deficits (4th percentile)	-previous diagnosis of childhood apraxia of speech -average receptive language score (53rd percentile)
9	8;4	Not DLD	-referral for below grade-level word reading ability -lack of response to phonological intervention	-deficits limited to phonological awareness (7th percentile) -above average receptive language (62nd percentile) -average expressive language (48th percentile)
10	9;2	Not DLD	-frequent pauses and word changes in narrative retell -low formulating sentences score (11th percentile) -low sentence assembly score (14th percentile)	-previous diagnosis of ADHD -history of foster care -low-to-average recalling sentences score (21st percentile)

Participants were asked to a) decide if they felt the presented profile warranted a diagnosis of DLD, b) decide and describe which of the child's presented symptoms they felt were most consistent/least consistent with a diagnosis of DLD, c) rate their confidence in their decided diagnosis on a scale from 1 to 100 and d) qualitatively describe any further information they would choose to seek to aid in their diagnostic process. See Appendix A for each presented case study profile. Following presentation of the 10 case studies, participants were asked to answer four additional questions related to their personal diagnostic processes and use of standardized test results in practice. See Appendix B for a copy of these four additional questions presented. It is important to note that readers may not agree with the case diagnoses presented in Figure 4.1. These cases were designed to, more or less, be diagnostically ambiguous. Our true interest in responses was in the diagnostic reasoning and the diagnostic agreement across clinicians.

4.2.3 Procedure

Participants were primarily recruited online through social media and email invitation. Additionally, a request was sent via email to all members of the preschool and school-aged interest groups of the Ontario Association of Speech-Language Pathologists and

Audiologists and a request for study participation was posted on the Speech and Audiology Canada homepage. After anonymously agreeing to participate, and indicating their involvement with a paediatric population, participants completed any or all of the remaining survey questions and case studies. For each individual case study, participants were asked to read the written description of the child's language profile and then to answer two quantitative (decision-making) questions and three qualitative (open-ended, descriptive) questions (described above).

4.2.4 Data Analysis

Quantitatively, for each profile, the percentage of participants who felt that the child should be/should not be given a diagnosis of DLD was calculated. Additionally, the average confidence rating (%) was calculated.

Qualitatively, the written feedback regarding the symptoms considered consistent with a DLD diagnosis, symptoms considered inconsistent with a DLD diagnosis and additional information/testing desired before providing a diagnosis was compared across participants to determine semantic equivalence. Additionally, the written responses to the four final questions relating to personal diagnostic processes, and use of standardized test results in practice, were analyzed. The qualitative research approach of thematic analysis was drawn upon to systematically identify and organize the data in order to make sense of, and offer insight into, collective meanings and experiences across the data set (Braun & Clarke, 2012). Specifically, the 6 phases of thematic analysis, as described by Braun and Clarke (2006), were employed. These phases were: 1) familiarizing oneself with the data, 2) generating initial codes for the data, 3) searching for themes amongst the generated codes, 4) reviewing these themes through an iterative process, 5) naming and defining the final set of themes and finally 6) producing a report of said themes. This analysis ultimately led to the creation of lists of response items reported across participants, for each case study, as well as the percentage of participants who reported each item.

4.3 Results

4.3.1 Quantitative Results

Figure 4.2 provides a summary of the diagnostic decisions for all cases. Across all 10 profiles, the average diagnostic consensus between participants was 81% (ranging from a low of 51% to a high of 96%). This result indicates that, overall, participants felt similarly regarding which profiles warranted a DLD diagnosis and which did not. The average diagnostic-decision confidence rating across the 10 cases was 67% (ranging from a low of 57% to a high of 78%).

Figure 4.2

Quantitative Results for the 10 Language Profiles – Profile characteristics include intended diagnosis and age (Dx), percentage of respondents that would diagnose the presented child with DLD (% Yes), percentage of respondents that would not diagnose the presented child with DLD (% No). Both symptoms viewed as consistent or inconsistent with DLD are reported as symptoms mentioned by 50% or more (>50%) of respondents or 15% - 50% of respondents. Other information includes information mentioned by 20% or more of participants as wanted to aid in the diagnostic process.

Profile Characteristics			**Symptoms Viewed as Consistent with DLD**		**Symptoms Viewed as Inconsistent with DLD**		**Other Information Required for Diagnosis**
Age/ Dx	% Yes	% No	>50%	15% - 50%	>50%	15%-50%	
7;2 DLD	92%	8%	-11th percentile receptive language -15th percentile expressive language	-Difficulty with socialization -Concerns regarding word finding and sentence formulation -Parental anxiety regarding language development		-Difficulty with socialization	-40% called for **<u>more robust language testing</u>** (e.g., narrative) -39% called for social communication testing -25% called for a more complete review of the child's medical history

6;11 DLD	83%	17%	-Persistent language deficits after 2 intervention periods -Low scores on 2 informal narrative language tests		-Lack of information regarding other areas of language development -Persistent language deficits after 2 intervention periods -All symptoms ARE consistent		-78% called for **more robust language testing** (e.g., standardized testing) -25% called for a more complete review of the child's medical history -21% called for a referral to either a psychologist or an audiologist
4;6 DLD	78%	22%	-2nd percentile receptive language -9th percentile expressive language	-Short, ungrammatical sentences -Difficulty following instructions -Functional impact	-35th percentile on a speech screening		-49% called for a more complete review of the child's medical history -35% called for **more robust language testing** (e.g., narrative) -31% called for referral to an audiologist

5;9 DLD	78%	22%	-Grammatical errors in spontaneous speech	-Difficulty following instructions -Difficulty with classroom vocabulary -Difficulty with narrative language -Difficulty communicating with peers -Teacher concerns regarding academic achievement		-Desire/ability to communicate with peers -Reported difficulty paying attention in class	-61% called for a full standardized assessment -37% called for a more complete review of the child's medical history -25% called for **more robust language testing** (e.g., narrative)
12;0 DLD	49%	51%	-10th percentile formulating sentences subtest	-Concerns regarding written language -6th percentile reading comprehension -4th percentile non-word repetition -Documented history of intervention prior to age 5		-No observed errors in language sample -36th percentile recalling sentences -28th percentile word definitions	-51% called for **more robust language testing** (e.g., narrative) -25% called for the probing of phonological awareness skills
8;4 Not DLD	4%	96%	-Vocabulary gaps in both native and second languages	-Disorganized narrative retell -Teacher concerns regarding second language acquisition -NO symptoms are consistent	-No reported concerns in native language -Success with dynamic assessment	-Limited exposure to second language (2.5 years)	-26% called for more detailed testing of native language

5;4 Not DLD	5%	95%	-Difficulty following instructions	-Behavioural outbursts during moments of frustration	-Immediate success following strategy implementation	-Behavioural issues during transitions -Engrossed play/attention issues	-68% called for **<u>more robust language testing</u>** (e.g., receptive) -35% called for referral to an audiologist -20% called for a more complete review of the child's medical history
5;7 Not DLD	8%	92%	-4th percentile test of morphology	-Teacher concerns regarding word finding -NO symptoms are consistent	-Previous diagnosis of childhood apraxia of speech -53rd percentile receptive language		-47% called for **<u>more robust language testing</u>** (e.g., phonological awareness) -29% called for more complete expressive language testing -20% called for a more complete review of the child's total history
8;4 Not DLD	18%	82%	-7th percentile test of phonological awareness	-Referral for below-grade-level reading ability	-62nd percentile receptive language	-7th percentile phonological awareness (and linkage of	-43% called **for <u>more robust language testing</u>** (e.g., written

				-NO symptoms are consistent	-48th % percentile expressive language	difficulties to this deficit)	language, vocabulary) -22% called for the investigation of dyslexia
9;2 Not DLD	40%	60%		-Teacher concerns regarding oral and written language -11th percentile formulating sentences -Concerns regarding general language development -14th percentile sentence assembly	-Comorbid diagnosis of ADHD	-Concerns regarding history of trauma and unstable housing	-53% called for **more robust language testing** -34% called for a more complete review of the child's total history -24% called for information regarding ADHD management

4.3.2 Qualitative Results

A complete breakdown of all symptoms qualitatively reported by participants as being consistent or inconsistent with DLD, and the exact percentage of participants who reported each symptom, can be found in Appendix C.

Figure 4.2 also presents a summary of other information that 20% or more of participants felt was required in order to make a proper diagnosis. In seven of the 10 cases, greater than 20% of clinicians reported wanting to complete a more thorough review of the child's medical or developmental history. It should be noted however that, this information was called for in all 10 cases (ranging from 8% to 49% of participants). Additionally, in three of the 10 cases, greater than 20% of clinicians wished to refer the child to another professional (an audiologist or psychologist) for assessment before making a diagnosis. Again, this information was actually called for in all 10 cases (ranging from 3% to 35% of participants). Most strikingly, in nine of the 10 presented cases, greater than 20% of clinicians reported wishing to complete more robust language testing before making a diagnosis. Similarly, to previous results, this information was called for in all 10 cases (ranging from 19% to 78% of participants). The areas of language that were called on to be explored during this more robust language testing varied across cases with narrative language testing being called for most frequently. A complete list of further information desired to aid in the diagnostic process can be found in Appendix D.

The four final questions of the survey, relating to clinicians' personal diagnostic practices and standardized test use were also analyzed thematically. From this analysis, lists of commonly reported responses were created and two overarching themes emerged – a general desire for the completion of more robust language testing prior to diagnosis and a reliance on standardized test scores during the diagnostic process.

The first of the final four survey questions asked participants to describe situations in which standardized test scores were INDICATIVE of a language disorder, but they WOULD NOT provide a child with a diagnosis of language disorder. One

hundred and fourteen participants responded to this question, many of whom described more than one situation. The most commonly described situation in which a diagnosis would not be provided regardless of impaired standardized language test scores was when the child exhibited a comorbid diagnosis or biomedical factor (57%, *n* = 65). The most commonly cited comorbid diagnoses that would deter a clinician from diagnosing were autism spectrum disorder, childhood apraxia of speech, acquired brain injury and intellectual impairment. An additional 34% of respondents (*n* = 39) reported that they would not be willing to provide a language disorder diagnosis if a child was an English language learner and 23% (*n* = 26) if a child displayed attentional difficulties. Of respondents, 13% (*n* = 15) shared that a diagnosis of language disorder would not be provided if the child exhibited a hearing impairment or if the clinician was suspicious of a hearing impairment. An additional 10% of clinicians (*n* = 11) explained that if their assessment results revealed borderline standardized test scores or conflicting results, they would refrain from diagnosing with one clinician sharing, "… if the scores indicate DLD but the difficulties are not consistent … I haven't provided the label." Smaller proportions of respondents shared that they would not provide a language disorder diagnosis, even with impaired standardized test scores, if a) the child was under the age of five years (9%, *n* = 10), b) the child had a documented history of trauma or social-emotional issues (7%, *n* = 8), c) there the was no evidence of functional impact (7%, *n* = 8) or d) the child exhibited intelligibility issues (5%, *n* = 6). Finally, a small group of respondents shared that a diagnosis would not be provided if the child demonstrated some type of response to intervention (4%, *n* = 4) with one clinician sharing, "I've also not provided a label when scores indicate a DLD but, through response to intervention trials, the child succeeds at the tasks at hand.".

The second of the final four survey questions asked participants to describe situations in which they WOULD provide a diagnosis of a language disorder despite standardized test scores being CONTRAINDICATIVE of a language impairment (*n* = 112). The most commonly described situation in which a diagnosis would be provided regardless of test scores was when there was a clear functional impact of language ability, or rather lack thereof, on the child's life (44%, *n* = 49). Another 25% of respondents (*n* = 28) suggested that they would provide a diagnosis following an informal assessment

alone (if indicated). An additional 9% (*n* = 10) shared that they would still provide a diagnosis of language disorder if the child exhibited borderline test scores in combination with some other symptom indicative of impairment (e.g., functional impact, receptive language concerns). Smaller proportions of respondents shared that they would still provide a language disorder diagnosis, without impaired standardized test scores, if a) the child exhibited difficulty in language areas like literacy, reading or writing (7%, *n* = 8), b) the child exhibited a history of language difficulty (5%, *n* = 6) or c) if the child had demonstrated a lack of response to intervention (5%, *n* = 5). Finally, 13% (*n* = 14) of respondents strongly emphasized that there would be NO situation in which they would provide a language disorder diagnosis without standardized test scores to support that diagnosis. In some cases, this response was due to personal practices and in others it was due to constraints placed on the clinician by his or her location of practice. One clinician shared that, "due to criteria at my school board I would never be able to recommend a language disorder without standardized data evidence…".

Next, survey respondents were asked to provide qualitative details regarding how they make decisions regarding the severity of DLD when providing a child with a diagnosis. Of 115 responses, 57% (*n* = 65) shared that the level of observed functional impact on the child influenced their decisions regarding DLD severity. Some 53% (*n* = 61) indicated that standardized test scores, percentile ranks and standard deviations from normal impacted their decision. An additional 15% (*n* = 17) shared that the persistence of a child's difficulty, or lack of response to intervention, would impact decision making while 12% (*n* =14) suggested that the number of language subsystems impacted would influence their decision regarding severity. One participant shared, "[There is] higher severity if more domains of language are affected (e.g., syntax, semantics, morphology, phonology, pragmatics) [and] when weaknesses affect both receptive and expressive channels". Another 9% of respondents (*n* = 10) shared that they would make decisions regarding the severity of DLD following informal observation of the child. Additionally, 4% of clinicians (*n* = 5) shared that severity decisions would be made after reading/understanding a child's case history while another 4% (*n* = 5) reported relying on consultation with other colleagues/a child's teacher/a child's parents before providing information regarding severity. Finally, 14% (*n* = 16) explicitly stated that they would not

provide any indication of severity when diagnosing a child with DLD. Again, in some instances, this type of response was clearly due to a clinician's personal practice with one respondent sharing,

> "Well, I don't typically say mild, moderate [or] severe. Perhaps I should revisit that. If it is very severe and I am trying to get the point across to the parents that there is no doubt the child needs significant therapy, I may say a moderate to severe disorder. Otherwise, I usually just describe in great detail, make the diagnosis with appropriate code and make recommendation for areas of instruction that should be addressed".

In other instances, this type of negative response reflected constraints placed on the clinician from his/her location of practice with another clinician stating, "at my workplace we do not specify severity levels of DLD".

Finally, participants were asked what standardized test cutoff points they use when considering a diagnosis of DLD. Qualitative results indicated substantial variability in practice across clinicians. Of 112 respondents, 48% (n = 54) reported relying on a 16th percentile cutoff score when considering a DLD diagnosis. An additional 17% (n = 19) indicated that they rely on the child's overall profile, in combination with their clinical judgement, when making diagnostic decisions rather than specific cutoff scores. The remainder of participants reported relying on various other cutoffs during diagnosis. Percentile cutoff scores reported as being used by clinicians included the 2nd, 4th, 5th, 6th, 7th, 9th, 10th, 12th, 16th and 25th percentiles. Standard deviation cutoff scores reported included -1, -1.5 and -2.

4.4 Discussion

The present study examined which types of clinical language profiles, and specific assessment results, were viewed by clinicians as warranting the diagnostic label DLD. By providing clinicians with the opportunity to review and provide feedback on 10 carefully crafted case studies designed to exploit particularly challenging aspects of the diagnostic

process, it was our goal to develop a deeper understanding of the assessment/diagnostic process for DLD in practice.

Overall, diagnostic agreement was relatively high across eight of the presented case studies and notably low in the remaining two. High diagnostic agreement was seen in cases presenting clear deficits according to standardized test scores, the presence of bilingualism, obvious functional impact on the child's life and/or high levels of parental/teacher concern. The two cases demonstrating the lowest levels of diagnostic agreement were a) an older child (12;0) presenting with a primary language deficit in his written language skills and b) a child with clear language challenges but with a comorbid diagnosis of ADHD. These particular factors are clearly challenging to the DLD diagnostic process.

4.4.1 DLD and Written Language Challenges

Case #5 was created to reflect an older child (12;0 years of age) with DLD experiencing challenges in his written language development. Responses to this case study clearly indicated uncertainty regarding appropriate diagnosis, with 49% of participants believing this child had DLD and 51% believing that he did not have DLD. According to Dockrell & Connelly (2015), many children with DLD experiencing difficulty with oral language acquisition also experience difficulty in the production of written language. This may be especially apparent in later childhood (as in the presented case) or adulthood when the individual has acquired sufficient oral language skills to successfully interact in day-to-day life but may still struggle when faced with more complex language tasks like producing written language (Conti-Ramsden et al., 2018). This child presented with error-free spontaneous speech, suggesting somewhat sufficient oral language skills, but received several standardized test scores suggesting that his language broke down when challenged (e.g., 10^{th} percentile on a formulating sentences language subtest, 6^{th} percentile score on a test of reading comprehension, 4^{th} percentile score on a test of non-word repetition). Although 46% ($n = 67$) of respondents cited the classroom teacher's concerns regarding this child's written language development as being indicative of a

language disorder, the level of uncertainty regarding diagnosis was highest in this case study compared to the other nine profiles.

4.4.2 DLD and ADHD

Case #10 presented a child (9;2 years of age) with low expressive language skills (11th percentile on a formulating sentences language subtest and 14th percentile on a sentence assembly language subtest), concern from his classroom teacher regarding his oral and written language skills, and a previous diagnosis of ADHD. Additionally, this child presented with frequent pauses and mazes during a narrative retell task – language behaviours commonly exhibited by children with ADHD (Redmond, 2004). Clinician responses revealed the second lowest level of diagnostic agreement across the 10 cases, with 40% of participants stating that they believed this child to have DLD and 60% of participants stating that they did not believe him to have DLD. Also of note, the average level of diagnostic confidence for this profile was 57% -- the lowest level across all 10 case studies. Of respondents, 66% reported that they felt that this child's previous diagnosis of ADHD was inconsistent with a diagnosis of DLD and therefore they were not comfortable providing the DLD label. Although this profile was designed to reflect language errors that could be accounted for by an ADHD diagnosis, more than one third of respondents felt that his low standardized test scores and the concerns from his classroom teacher may suggest a comorbid DLD. This uncertainty was further reflected in the fact that 53% of clinicians wished to complete more robust language testing to aid in their diagnostic decision making. These results suggest a general level of uncertainty regarding language disorders in children with ADHD with one clinician sharing, "to be more confident I need to know more about the relationship between DLD and ADHD".

4.4.3 DLD and Bilingualism

Case #6 presented a bilingual child (8;4 years of age) without DLD but with several noteworthy language deficits (e.g., vocabulary gaps in both L1 and L2 as well as disorganized narrative retell) and a referral from his classroom teacher following concerns regarding the development of his L2. It is well-recognized that a child who is

learning more than one language simultaneously may present with symptoms typical of a language disorder and may be challenging for an SLP to assess and diagnose. It can be very difficult to tease apart true language difficulty from simply a lack of language exposure. Impressively, 96% of respondents agreed that this child did not have DLD, representing the highest level of diagnostic agreement across the 10 case studies. Of respondents, 76% stated that lack of parental concern regarding the child's L1 development was contraindicative of a language disorder. Additionally, 40% of respondents cited lack of L2 exposure (2.5 years) as suggesting that this child's deficits were likely due to limited experience rather than a true language disorder. These findings indicate a familiarity, among clinicians, with research suggesting that mastery of a second language can take over 3 years (Paradis, 2016).

4.4.4 DLD and Phonological Awareness Deficits

Case #9 described a child (8;4 years of age) without DLD, exhibiting average/above average expressive and receptive language abilities (48th and 62nd percentiles, respectively) but deficits in word-reading and phonological awareness (7th percentile) as well as a lack of response to prior phonological awareness intervention. Our intention when creating this profile was to describe a child demonstrating deficits in phonological awareness skills but sparing all other areas of language. In the second CATALISE study (Bishop et al., 2017) stated that, while phonological awareness deficits are often seen in children with DLD, DLD should not be diagnosed based on deficient phonological awareness skills alone because it is a metalinguistic skill that can be either a cause of literacy problems or a consequence of literacy problems (Wimmer et al., 1991). Challenges isolated to phonological awareness skills would be more indicative of dyslexia than DLD. A total of 82% of respondents agreed with the intended diagnosis and felt that the child did not have DLD while 18% felt that he did. Research shows that approximately 50% of children with DLD also meet the diagnostic criteria for dyslexia as a comorbid condition (McArthur et al., 2000; Adlof & Hogan, 2018). The 18% of respondents who felt that this child did have DLD, might be reflective of clinical knowledge regarding this high overlap between DLD and dyslexia. Of note, 43% of

clinicians called for more robust language testing in this case, likely for the purpose of differential diagnosis.

4.4.5 DLD Diagnosis and Robust Language Testing

Beyond case-specific issues, several themes arose from the qualitative comments provided by the respondents. One of these themes was a general desire for more robust language testing. Strikingly, in every presented case, a sizable percentage of clinicians reported wishing to complete more robust language testing before feeling completely confident in their diagnosis. In their call for further diagnostic testing, clinicians wished to complete a wide variety of additional tests (e.g., tests of narrative language, tests of vocabulary, tests of written language, tests of morphology, tests of phonological awareness, etc.). Even when up to 6 language test scores were reported as part of a profile, many participants still wished to complete further testing. Across the 10 profiles, the minimum percentage of participants calling for further language testing was 19% (case #6) and the maximum was 78% (case #2). These noteworthy results beg the question, what is an appropriate balance between a) efficiency in the diagnostic process and b) thoroughness in testing so as to provide an accurate diagnosis? Ensuring both a timely and accurate diagnosis may be a challenge that SLPs are facing in practice.

4.4.6 Use of Standardized Tests in DLD Diagnosis

Another theme emerging from the qualitative data was the notion that most clinicians rely on standardized test scores when diagnosing DLD. Although there was clear variability in the specific cutoff scores used when interpreting these standardized test score results (with the largest proportion of participants (48%, $n = 54$) abiding by a 16^{th} percentile cutoff score) participants were less likely to diagnose without standardized measures. Three presented cases (cases #2, #4 and #9) included only informal assessment measures. Even though diagnostic agreement was not negatively affected by this lack of standardized assessment, 78%, 61% and 68% of participants called for more robust language testing (including standardized measures) in each case, respectively. One participant shared, “I would not assign a label without at least attempting some formal

assessment." Another respondent stated, "I'd rather use a 'very unsure one way or another at this stage' response! There are indications [of a language disorder] however there has been no formal assessment to date…". These responses provide qualitative evidence that the majority of clinicians may be uncomfortable diagnosing DLD unless they have standardized assessment data to verify provision of the label. Far fewer clinicians seemed willing to diagnose DLD following informal assessment measures alone. Only 17% of respondents reported that, rather than using a specific cutoff score when diagnosing DLD, they relied on their clinical judgement when looking at the overall profile of a child. Similarly, when describing situations in which clinicians may be inclined to provide a diagnosis of DLD when standardized test scores are contraindicative of a language disorder, 25% shared that they may do so following informal assessment measures. In contrast, 13% strongly emphasized that they would never provide a language disorder diagnosis without standardized test scores to support said diagnosis.

4.4.7 Limitations

The ten individual cases presented in this study were designed by the authors to include points/symptoms/assessments, outlined in the literature, as complicating the diagnostic process. Diagnostically, these cases were somewhat ambiguous and individual clinicians may have agreed or disagreed with the intended diagnoses. Overall, the goal of this study was to investigate diagnostic agreement in the face of common, yet complicated, paediatric language profiles. By intentionally varying the areas and severity of language functioning difficulty across the cases, we sought to examine the consistency with which these challenge areas influenced clinicians' judgements. We acknowledge though, that these cases were not perfect examples of children with DLD or without DLD. Additionally, although there were 12 different countries represented in these results, this questionnaire was only offered in English and the majority of respondents reported practicing in the same country (Canada, 62%, n = 134).

4.5 Conclusions

Overall, across 10 carefully constructed paediatric language profiles exhibiting common clinical challenges to diagnosis, diagnostic agreement regarding DLD was quite high. Two particular profiles, demonstrating written language difficulties and a comorbid diagnosis of ADHD, led to the poorest levels of diagnostic agreement. Across all profiles, clinicians shared a desire to complete more robust language testing (including a wide range of diagnostic tests) in order to increase their confidence in providing a DLD diagnosis. It is also important to note that across respondents there was a consistent call for more education regarding DLD and its diagnosis. The results of this study reveal an important truth – diagnosing DLD is not a simple task especially in the face of complex language profiles with a wide range of complicated symptoms and test results.

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Chapter 5

5 General Discussion

Evidence-based practice (EBP) refers to the integration of clinical expertise acquired through one's professional development and experiences, the best available research evidence from the scientific literature and the unique needs presented by a client or clinical setting (Sackett et al., 1996). In recent years, EBP has become a central and critical theme in all areas of health care across the world including health education, practice, management and policy (Rycroft-Malone et al., 2004). Currently, EBP is considered a cornerstone of modern healthcare which extends to all areas of the field including speech language pathology.

Major governing bodies, like the American Speech-Language-Hearing Association have published position statements calling on speech-language pathologists to incorporate the principles of EBP in their clinical decision making in order to provide the highest caliber of clinical care. By actively engaging in EBP, SLPs can ensure that they are providing improved clinical services, are being held accountable for their chosen interventions, are providing more standardized care across patients and are contributing to reducing the gap that exists between the scientific research and clinical practice (Schlosser, 2003).

Despite awareness of the importance of EBP, there is still a notable gap that exists between the best-available research evidence and clinical practice. In response to this gap, the field of implementation science was created. Implementation science, or the study of various methods used to improve the quality of patient care, and patient health outcomes, following the systematic uptake of research into clinical practice, has the overarching goal of ensuring that EBP is adopted into clinical and educational settings (Eccles & Mittman, 2006; Douglas et al., 2022). An additional goal of implementation science is to identify, advance and examine various implementation strategies or "methods or techniques used to enhance the adoption, implementation, and sustainability of a clinical program or practice" (Powell et al., 2015; Proctor et al., 2013).

In this thesis, we extended the current literature on EBP within the field of speech language pathology. Through two specific case studies, we were able to show how four implementation strategies, originally identified and described by Powell et al. (2015), could be used to encourage the uptake of the most up-to-date scientific evidence into current clinical practice. In this chapter, I will summarize the primary findings from chapters 2, 3 and 4, discuss the relevant implications of this work and discuss important recommendations for future research endeavours in the area.

5.1 Relevant Findings

5.1.1 Chapter 2

Interprofessional collaboration is an EBP that is commonly recommended to improve practice in a range of settings from business to healthcare to education (Vangen & Huxham, 2003; Schot et al., 2020; Goulet et al., 2003). This type of collaboration involves an active and continuous partnership between professionals, with distinct skillsets and backgrounds, who actively work together to problem solve and provide services (Morgan et al., 2015). Research has demonstrated that interprofessional collaboration can improve provided services following collaborative efforts in a range of areas. More specifically to the area of early language and literacy development, interprofessional collaboration has proven to have a positive impact on the academic outcomes of students following collaboration between SLPs and classroom educators (Archibald, 2017; Gillam et al., 2014; Hadley et al., 2000; Throneburg et al., 2000). Although the positive impacts of SLP-educator collaboration are clear, and although collaborative practice is a consistently recommended EBP in the field of early language/literacy instruction, the process of collaboration is notoriously challenging to study.

This chapter presented part one of the first case study of this thesis. By using qualitative research methods to investigate the factors that both positively and negatively affected educator-SLP collaboration during language and literacy instruction, we were also able to assess one of Powell et al.'s EBP implementation strategies – the creation of

a learning collaborative. Specifically, we were able to investigate how the formation of these collaborative partnerships could positively contribute to the successful implementation of a clinical innovation—an evidence-based language and literacy program.

By deeply exploring the complexities of interprofessional collaboration, and following the collection of both personal narratives and field observations, five themes were identified as being influential to a successful collaborative partnership. These themes were: a gradual shift in responsibility/support, buy-in, time, recognizing strengths in a collaborative partner and professional development participation. Most of these identified themes, with the exception of time, acted as facilitators (i.e., enhanced successful collaboration) in some situations and acted as barriers (i.e., hindered successful collaboration) in other situations—depending on the circumstances and/or the dynamics of the specific collaborative partnership. Time, however, strictly acted as a barrier to successful collaboration in this particular study. In studying these five themes, one final overarching theme also arose—the theme of frustration. Although feelings of frustration were not explicitly described in any personal narratives, sentiments of frustration were identified as arising and interacting with all other identified themes and to varying extents across the various partnerships.

This detailed investigation into the complicated nature of interprofessional collaboration exposed themes that must be considered when entering and maintaining strong and successful collaborative partnerships. The results of this investigation can be thought of as a map for other professionals of how to best approach and navigate an optimally successful collaborative relationship, and in the context of this study, is especially applicable to those working in a schoolboard setting.

5.1.2 Chapter 3

Years of research, aimed at improving reading instruction for students especially in the early years of their education, has supported the use of a structured literacy approach to teaching oral and written language (Spear-Swerling, 2019). Remarkably, evidence has

suggested that this approach is beneficial for *all* students, even those struggling with literacy difficulties. The primary features of structured literacy, and their value in effective literacy instruction, have been well-recognized for years (Carnine et al., 2009; Moats, 1999). The use of a systematic and explicit approach to teaching foundational reading skills, like structured literacy, exemplifies a 'high-leverage' intervention – an evidence-based intervention with established effectiveness for supporting all children in the process of learning to read (Spear-Swerling, 2019).

In 2000, the National Reading Panel stated that for a reading program to be truly comprehensive, it must address five key components: phonological awareness, phonics, fluency, vocabulary and text comprehension. When considering these five components, it is clear that SLPs, with their specialized and extensive knowledge of linguistic concepts and typical/atypical language development, are particularly well-equipped to support classroom educators in these instructional areas for all students learning to read, including those who have been identified as having a language disorder (Powell, 2018). A large and well-recognized body of research has demonstrated that collaborative classroom instruction between SLPs and educators has improved students' academic outcomes in a number of areas of language and literacy development (Gillam et al., 2014; Hadley et al., 2000; Throneburg et al., 2000).

This chapter presented part two of the first case study of this thesis. This chapter explored and evaluated an evidence-based tier one language and literacy program implemented in grade one classrooms. In this program, SLP-educator partners collaboratively participated in professional development sessions focused on the implementation of a structured literacy approach in the classroom and engaged in planning, reciprocal coaching and co-instruction to support classroom implementation of the program across one school year.

By, examining whether or not improvements were seen in student literacy outcomes, as well as in SLP and educator knowledge and self-perceptions of assessment and instruction abilities, we were also able to assess another two of Powell et al.'s EBP implementation strategies – the development of educational materials and the

organization of implementation team meetings. Specifically, we were able to investigate how the language and literacy education provided to students could be improved following the creation of evidence-based professional development educational materials and following the provision of allocated time to come together to reflect on the implementation process.

In the evaluation of this program, minimal improvements in SLP and educator knowledge and confidence were seen across the school year. Participants reported that the project was moderately easy to implement and that this ease of implementation remained consistent across the program. Additionally, significant improvements in grade one language and literacy outcomes were seen on measures of phonological awareness, word reading, a composite reading measure and oral language – all areas that aligned with the five pillars of reading instruction outlined by the National Reading Panel in 2000.

5.1.3 Chapter 4

Developmental language disorder (DLD) is defined as "language difficulties that create obstacles to communication or learning in everyday life that are unlikely to resolve by five years of age and are not associated with any known biomedical condition such as brain injury, neurodegenerative conditions, genetic conditions or chromosome disorders such as Down Syndrome, sensorineural hearing loss, autism spectrum disorder or intellectual disability", and affects approximately 7% of children (Bishop et al., 2016; Bishop et al., 2017; Norbury et al., 2016; Tomblin et al., 1997). Despite ongoing research and increasing awareness, diagnosing DLD in practice is not a simple task. The profiles of children with DLD are notably heterogeneous, the areas of language impacted by the disorder are variable and there are a number of other conditions and co-occurring disorders that make it challenging for clinicians to determine if the difficulties they see in a presenting child truly represent the disorder (Bishop et al., 2017). Furthermore, there is considerable variability in DLD assessment methods across clinicians. While many professionals view standardized tests as the best way to assess a child's language ability and identify deficits (Betz, 2013), which standardized tests are used and, more

specifically, which cutoff scores are employed when conducting the chosen standardized test is variable across clinicians. Importantly, Bishop et al. (2016) stressed that multiple sources of information must be combined in the assessment, and subsequent diagnosis, of DLD.

A survey aimed at examining the current practices, beliefs, and attitudes towards diagnostic label provision for children with language disorders revealed that, despite the label DLD representing best practice based on the best and most up-to-date scientific evidence, the uptake of this label in the clinical world was still inconsistent at best (Kuiack & Archibald, 2021). In response to these 2021 results, a second survey was conducted aimed at investigating which types of clinical language profiles and specific assessment results were viewed as warranting the diagnostic label DLD. By giving clinicians the opportunity to explore and provide feedback regarding a variety of carefully constructed case studies that varied on aspects of the diagnostic process known to be particularly challenging, we sought to develop a deeper understanding of the assessment/diagnostic process for DLD in current practice.

This chapter presented the second case study of this thesis. This chapter assessed exactly how clinicians were currently using the label DLD in their practices and identified any barriers or facilitators having an influence on this implementation process. This investigation also allowed us to assess another one of Powell et al.'s 2015 implementation strategies—assessing readiness. Specifically, we sought to explore factors influencing clinicians' change in labelling practices and adaptation of the evidence-based label of DLD across practice settings.

This survey included 10 carefully constructed paediatric language profiles demonstrating common clinical challenges to diagnosis. Eight of the presented profiles garnered high levels of diagnostic agreement while the remaining two showed notably low agreement. High diagnostic agreement was seen in cases presenting clear deficits according to standardized test scores, the presence of bilingualism, obvious functional impact on the child's life and/or high levels of parental/teacher concern. The two cases demonstrating the lowest levels of diagnostic agreement included an older child with a

primary language deficit in his written language skills and a child with clear language challenges but with a comorbid diagnosis of ADHD. These particular factors clearly presented a challenge to the DLD diagnostic process. Across all 10 profiles, clinicians shared a desire to complete more robust language testing in order to increase their confidence in providing a DLD diagnosis. Importantly, across respondents, there was a consistent cry for more education regarding DLD and its diagnosis. The results of this study, taken as a whole, reveal an important truth – diagnosing DLD is not a simple task especially in the face of complex language profiles with a wide range of complicated symptoms and test results.

5.2 Implications

5.2.1 Supporting Effective SLP-Educator Collaborative Partnerships in Language and Literacy Education

The evidence arising from the first case study, covered in both chapters 2 and 3, investigating collaboration between SLPs and educators and the subsequent positive impacts of these collaborative efforts on students' language and literacy outcomes, provides a strong example of how EBP plays an important role in improving current practice in both the worlds of speech language pathology and education. By recognizing and exploring the barriers and facilitators to successful collaborative practice between SLPs and educators we provide a "blueprint" for other clinicians to consider when beginning their own, respective, collaborative journeys. It is easy to imagine that the themes identified in our qualitative investigation of these collaborative partnerships can be generalized to other collaborations in other fields as well. Because interprofessional collaboration is a recommended practice in a range of areas like business, healthcare and education (Vangen & Huxham, 2003; Schot et al., 2020; Goulet et al., 2003) the themes identified in this particular study may be applicable to collaborative efforts beyond the unique case of SLPs working collaboratively with classroom educators.

Specific to reading instruction intervention programs, this dissertation adds to our current understanding of the importance of high-leverage structured literacy approaches in the classroom focusing on phonological awareness, phonics, fluency, vocabulary and

text comprehension (National Reading Panel, 2000). The improvement seen in student language and literacy outcomes following participation in this program are consistent with the notion that focusing instructional efforts to include these key components is beneficial. Furthermore, this thesis provides even further evidence that SLPs can play an important role in early years language and literacy instruction. This understanding of best practice will be especially important in the coming years as the Ontario Human Rights Commission's Right to Read Report (2022) continues to guide education and practice. This thesis project was completed prior to the Right to Read Report, but there is no doubt that other schoolboards will be looking to enhance their reading instruction as well. Our project serves as a strong example of EBP—moving the best scientific evidence regarding reading instruction into practice and critically evaluating outcomes following implementation.

5.2.2 Exploring Clinicians' Readiness for Use of the Label DLD

The second case study presented in this dissertation examined which types of clinical language profiles and specific assessment results were viewed by clinicians as warranting the diagnostic label DLD. Findings provided insight into which types of clinical profiles are particularly challenging for clinicians to manage in the field. These findings, combined with a consistent call from participants for more clarity and education regarding the DLD label, demonstrate that, despite significant advocacy efforts in recent years, more awareness and education regarding DLD is necessary. Although the CATALISE studies (Bishop et al., 2016, 2017) described diagnostic criteria for DLD, no prescriptive formula for when to apply the label was provided and this ambiguity was evident in responses to this study. By identifying complexities in language profiles that are viewed as particularly challenging for clinicians, education efforts can be tailored to address these uncertainties and improve diagnostic accuracy and clarity moving forward.

5.2.3 Demonstrating the Effectiveness of Implementation Strategies in EBP

Throughout this thesis four implementation strategies, identified and described by Powell and colleagues (2015), were investigated as they were applied to real-world clinical practice in speech language pathology. These strategies included: creating a learning collaborative, developing educational materials, organizing and implementing team meetings and assessing readiness/identifying barriers and facilitators.

The first case study, covered in chapters 2 and 3, provided three strong examples of how implementation strategies can be beneficial when moving an evidence-based intervention program into practice. Firstly, through the creation of a learning collaborative, SLPs and educators, the two providers of services involved in the grade one language and literacy project, were brought together to learn about the best available research evidence. This collaborative learning had a positive impact on the overall implementation of this particular clinical innovation (Powell et al., 2015). Our study demonstrated that those pairs with a higher level of collaboration, and a deeper level of appreciation for one another's skills, viewed implementation of the project more positively. Secondly, this case study also demonstrated that when the best available scientific evidence was presented through developed material, created by the project leads and shared during professional development sessions, the clinical innovation in question (the grade one language and literacy project) was easier for clinicians to implement. Thirdly, by providing SLPs and educators with protected time to engage in team meetings during project implementation, to come together to reflect on their efforts, to discuss shared learning and to support one another, we saw another implementation strategy at work. Previous research has demonstrated that having sufficient time is frequently experienced as a barrier to professionals when attempting to implement a project like the one outlined in this case study and expecting clinicians to not only understand but also to independently move research evidence into their practice may be unrealistic (Hartas, 2004; Throneburg et al., 2000). All three implementation strategies employed during this project allowed for this evidence-based intervention program to more easily and effectively be moved into practice.

In the second case study, through presenting clinicians with carefully constructed clinical paediatric language profiles we were able to look at a fourth implementation strategy from Powell and colleagues (2015) – assessing clinician readiness for, and identifying barriers and facilitators in, the implementation of the EBP of considering, and using when appropriate, the diagnostic label of DLD. To ensure that a clinical practice, that is backed by the best and most up to date scientific evidence, is actually implemented in the clinical world, it is important to gather data as to current practice. By examining how the label DLD was currently being used, we were able to understand which steps needed to be taken moving forward to ensure uptake of this practice in the field.

Taken together, this dissertation offers insight into the importance of considering and including implementation strategies to bolster practice and encourage the uptake of EBP in the clinical world. It is well-recognized that EBP is challenging yet critical to providing the highest level of patient care. Clinicians and researchers interested in examining and implementing EBP should consider Powell and colleagues' comprehensive list of 73 implementation strategies as a guide to support the movement of EBPs into clinical practice.

5.2.4 Demonstrating the Importance of Mixed-Methods Research

The second chapter of this thesis took a specifically qualitative research approach to investigating collaboration between speech language pathologists and classroom educators. Qualitative research is particularly well-suited to studying complex phenomena like human relationships—the relationships that are central to interprofessional collaboration. The literature suggests that qualitative research methodologies allow for deep exploration of a particular area (Stern, 1980) and provide opportunities to recognize and explore different individual perspectives (Clark, 2010). In chapter 2, by providing participants with the opportunity to share their unique perspectives of the collaborative process as it unfolded across the grade one language and literacy project, we were able to better understand the facilitators that encouraged success in these partnerships and the barriers that threatened successful implementation of the project. This examination added a level of depth to our investigation of this program and

allowed for a deeper evaluation of its success than the quantitative data could have provided alone. Presented together, chapters 2 and 3 created a complete picture of the grade one language and literacy project and its successes. Similarly, in chapter 4 mixed-methods research allowed for a clearer picture of current diagnostic practices in terms of the application of the label developmental language disorder. Adding consistent opportunities for clinicians to offer written feedback to compliment the quantitative evaluations of their assessments of each presented paediatric language profile allowed for a more holistic picture of current clinical practice. These three empirical chapters not only present evidence relevant to each individual study, but together demonstrate the deep level of insight that can be gained when including both quantitative and qualitative research methodologies—a deep level of insight that should be sought in all future research looking at EBP.

5.3 Directions for Future Research

The findings of the current thesis add to the existing literature regarding the importance and impact of EBP within the field of speech-language pathology and specifically with a school-aged population. Implementation science, and specific implementation strategies, were explored as a means to address the disparity or gap between existing research evidence and the clinical application of said evidence. This research just scratches the surface of the various implementation strategies that exist and that were outlined by Powell et al. (2015). Future research is needed to explore this vast array of implementation strategies to examine which strategies are most important and feasible in the field of speech language pathology and within particular speech language pathology practice contexts. Looking at the comprehensive list of implementation strategies that exist in the literature is undoubtedly overwhelming for researchers and clinicians alike. A comprehensive review of these strategies and how they may be used in the field of speech language pathology, including the examples presented in this dissertation, would be beneficial for all embarking on an EBP journey.

In recent years, as research has acknowledged the importance of EBP, a plethora of EBP models have been proposed across the literature. These models share the common goal of breaking down the innate complexity of translating evidence into clinical practice

and ensuring that time and resources are not invested into EBP efforts that ultimately fail (Schaffer et al., 2013). Unfortunately, because of the enthusiasm in the research world for EBP, there is often confusion related to the variety of terms used and the vast number of EBP models in existence. Similarly, growing awareness of the specific EBP of interprofessional collaboration has led to the creation of a wide variety of models of collaboration as well. These models are often specific to a particular professional field. In recent years, health care professionals have been expected to take on more and more responsibility in collaborative efforts between themselves and other professionals in clinical settings (D'Amour et al., 2008). A brief look at the current literature on EBP, and more specifically the EBP of interprofessional collaboration, makes it glaringly obvious that attempts to understand and execute a best approach to EBP in practice will be exceptionally overwhelming for clinicians. The current thesis offers a strong example of how interprofessional collaboration, an EBP, can be tackled in the field. To help generalize the current findings to other collaborative partnerships, the facilitators and barriers identified as part of the current thesis should be examined across other collaborative partnerships for validation and eventually mapped into a new model of EBP or onto a preexisting model of EBP.

Specific to the fourth chapter of this dissertation, research into the application of the label DLD should be continued over time as advocacy efforts and awareness regarding DLD continues to grow. In 2012, Raising Awareness of Developmental Language Disorder (RADLD, n.d.), an organization of clinicians and researchers in the United Kingdom, launched an awareness campaign for DLD including informational videos and awareness materials. In 2018, those efforts became international. By 2019, these awareness materials had been translated into 29 additional languages to spread awareness worldwide (McGregor, et al., 2020). It would be beneficial to also translate the survey used in the current dissertation to allow for a broader examination of DLD diagnosis across the world. Limiting our survey to English-speaking SLPs, the majority of whom practised in Canada, provides a very narrow view of practice and gathering more data from around the world would provide more insight into how advocacy and educative efforts can be improved on a large scale.

5.4 Conclusions

Overall, the findings arising from this thesis add to the EBP literature in the field of speech-language pathology. Specifically, this dissertation provided evidence for the benefits of collaboration between SLPs and educators in early years language and literacy instruction, the positive effects of professional development and coaching on the language and literacy outcomes of young students and the growing importance of the implementation of the diagnostic label DLD in current practice. More generally, this dissertation helped to demonstrate several ways in which implementation strategies can be effective in bolstering practice and contributing to the successful uptake of EBP in the clinical world. The three empirical chapters echo an important truth that is becoming more and more clear in the literature—EBP is challenging yet critically important for improving healthcare across fields and especially in the realm of speech language pathology.

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Appendices

Appendix A. Case studies used in Chapter 4.

Appendix B. List of four additional questions related to personal diagnostic processes and use of standardized test results in practice in Chapter 4.

Appendix C. A complete breakdown of all symptoms qualitatively reported by participants as being consistent or inconsistent with DLD and the exact percentage of participants who reported each symptom.

Appendix D. A complete list of further information desired to aid in the diagnostic process in Chapter 4.

Appendix A. Case studies used in Chapter 4.

Profile 1:

Jessica is referred to you by her kindergarten teacher who is concerned that Jessica's speech and language are not developing at the same rate as her classmates. Jessica is a monolingual English speaker. Her teacher reports that Jessica uses very short sentences that don't always make sense. She also shares that Jessica has a great deal of difficulty following instructions in the classroom. Additionally, she reports that Jessica is very difficult to understand and mispronounces many words. After collecting a language sample from Jessica, you confirm some of these concerns – the majority of her utterances are short and ungrammatical. Following the language sample, you decide to complete several subtests from a standardized language test. On the expressive language subtest Jessica performs at the 9th percentile and on the receptive language subtest she scores at the 2nd percentile. Finally, you conduct a speech screening which places Jessica's speech sound production ability at the 35th percentile.

Profile 2:

Hailey is a kindergarten student (age 5;7) who has been previously diagnosed with severe Childhood Apraxia of Speech. Her speech is difficult to understand due to frequent consonant distortions and syllable omissions often impacting the final sounds or syllables in words. Hailey's classroom teacher has expressed some concerns with Hailey's ability to get her message across reporting that Hailey isn't always able to find the words she wants to say or make sentences. In conversational speech, Hailey uses short phrases with multiple errors related to articulatory groping. On a test of morphology, Hailey omits morphological markers at the ends of words and scores at the 4th percentile. On a receptive language test, Hailey scores at the 53rd percentile.

Profile 3:

Elliot is a 12-year-old, monolingual, student who has been referred to you by his classroom teacher. Elliot's teacher shares some concerns regarding Elliot's written language skills. Upon consultation with Elliot's mother, you learn that he was previously seen by Preschool Speech and Language Services from the age of 3;6 to 4;2. Elliot was discharged from these services, without concern, and enrolled in kindergarten. You decide to complete a language sample with Elliot as well as several subtests from a standardized language test. In reviewing Elliot's language sample, you do not find any noticeable errors. Elliot scores at the 10th percentile on formulating sentences. He scores at the 36th percentile on recalling sentences. Elliot scores at the 28th percentile on word definitions. Finally, Elliot scores at 4th percentile on nonword repetition, the 6th percentile in reading comprehension and the 2nd percentile on his written language sample.

Profile 4:

Sarif is a grade 3 student (age 8;4) who has been referred to your services by his classroom teacher. Sarif's teacher is concerned that he is not learning English as expected. Sarif and his family immigrated to Canada 2.5 years prior to his referral. Although his first language is Arabic, Sarif has attended school, in English, for both grades 1 and 2. Sarif's parents report that they have no concerns regarding his language development in Arabic. You administer standardized vocabulary and narrative language tests. With the help of a translator, you re-administer these tests informally in Arabic. Vocabulary testing reveals Sarif has knowledge of some words in one, the other, or both languages. Vocabulary testing also reveals some gaps in knowledge. Sarif retells most of the details from a short story, although his retell is a bit confusing. After teaching him how to complete the task (with help from the translator) his performance improves.

Profile 5:

Miriam is a monolingual kindergarten student (age 5;9) who has been referred to you by her classroom teacher. This referral comes at the end of Miriam's senior kindergarten year due to concerns regarding her immature language. Her teacher reports that Miriam has difficulty in understanding classroom vocabulary, paying attention, telling stories, interacting with her classmates and following directions. At your request, Miriam's teacher completes a language checklist which reveals some significant academic concerns. You decide to observe Miriam in the classroom one afternoon. You watch Miriam play in the house centre with 2 female classmates. The three girls chatter about the roles they are taking in their game of "house". Miriam is observed to frequently comment to her classmates and the other girls are observed to sometimes respond to her. In speaking, you notice that Miriam exhibits many grammatical errors in her spontaneous speech. These errors include errors in verb tense, in pronoun use and in the omission of copulas and auxiliaries. When you draw closer to Miriam, she immediately begins to talk directly to you and you provide her with some scaffolding to assist her in telling you about her play episode.

Profile 6:

A kindergarten teacher at your school has come to you to ask for advice regarding one of her students. Jack, a senior kindergarten student, has been exhibiting angry outbursts regularly during most transitions between classroom activities. Jack is a monolingual English speaker. This teacher is unsure how to address these issues. She shares that punishment and discussion with Jack have proven ineffective. You decide to observe and intervene with Jack, in the classroom, over a two-day period.

During day 1 observation Jack is engrossed in several different play activities during free time. He plays with blocks and vehicles and playdoh. When the classroom teacher

instructs the children to clean up their activities and move to the carpeted area for a group activity, Jack does not acknowledge her. When the other students are just about finished with their cleanup, the teacher notices that Jack is still playing. The teacher approaches him to help tidy up. Jack is surprised by the teacher and becomes very angry when the trucks that he is playing with must be put away.

During day two you decide to trial intervention with Jack. At the end of the free choice period, as the teacher instructs the class to begin cleaning up, you draw Jack's attention to the teacher and her instructions. You then offer Jack a choice: he can either clean up his construction toys or place them in a special spot so that he can play with them again the next day. Jack chooses to move the construction materials to an empty shelf for tomorrow's activity time. Once these special materials are stowed away, you engage Jack in cleaning up the remaining odds and ends. After class, you explain and discuss the strategy with the classroom teacher.

One week later, the teacher visits your office to report that the strategy is still working very well, and Jack has been outburst-free for the entire week.

Profile 7:

Gabriel, a monolingual student in the second grade (age 8;4), has been referred to your services following parental and teacher concerns. His classroom teacher and parents report that his word reading ability is below grade-level. Upon reviewing Gabriel's file you find that he performed below expectations on a phonological awareness screening tool in kindergarten. In grade one he participated in a 6-week phonological awareness small-group intervention with his school SLP. You decide to have Gabriel complete several different tests over a week-long period. On a test of expressive language Gabriel scored at the 48th percentile. On a test of receptive language Gabriel performed at the 62nd percentile. However, on a test of phonological awareness Gabriel scored at the 7th percentile.

Profile 8:

Maeve, a first-grade student, has been referred to you by her parents. Maeve is a monolingual English speaker. Her parents share general concerns about her language development. They report that Maeve seems to have difficulty thinking of the words that she wants to say. They also find that Maeve has trouble putting words together to form sentences that make sense. Maeve's parents have been waiting for an assessment for a long time and are very eager to receive some results. In consulting with Maeve's classroom teacher you learn that Maeve has a great deal of difficulty forming friendships because "somehow she just doesn't seem to fit in". Her teacher does not have any concerns about Maeve's attention or classroom behaviour. You decide to conduct 2 subtests from a standardized language test with Maeve. On the expressive language composite Maeve scores at the 15th percentile and on the receptive language composite she scores at the 11th percentile.

Profile 9:

Caden is a young boy, age 9;2, who has been referred to you by his classroom teacher following serious concerns regarding his oral and written language. Caden is a monolingual English speaker. The teacher shares with you that Caden has been in and out of foster care over the past 2 years. Caden also has a previous diagnosis of ADHD. His teacher reports that he is very well-liked by the younger boys in his split-grade classroom. You decide to complete several subtests from a standardized language test and an informal story-retell task with Caden. Caden performs at the 21st percentile in recalling sentences, the 11th percentile in formulating sentences and the 14th percentile in sentence assembly. During his story-retell task Caden is able to retell all of the main events of the story. However, Caden also exhibits frequent pauses and word changes throughout the task.

Profile 10:

Lilly, age 6;11, is a monolingual English student who has been on your caseload for the past two years. You first worked with Lilly after she was red flagged following a low score on an informal narrative language assessment completed in kindergarten. Following Lilly's low score, she completed an 8-week intervention, with you, targeting language concepts. In early grade one Lilly again received a low score on the same informal narrative language assessment. Lilly subsequently completed another 8-week intervention period with you focusing on language concepts, storytelling and vocabulary development. You just scored Lilly's most recent informal narrative language assessment. This assessment was completed at the end of her first-grade year. Lilly again received a score below cutoff on your local norms.

Appendix B. List of four additional questions related to personal diagnostic processes and use of standardized test results in practice in Chapter 4.

1. Describe a situation when standardized test scores are indicative of a language impairment but you would NOT provide a diagnosis of language disorder.

2. Describe a situation when standardized test scores suggest no language impairment but you WOULD provide a diagnosis of language disorder.

3. What standardized test cutoff points do you use when considering a diagnosis of DLD? Provide as much detail as possible. (E.g., scores, percentiles, standard deviation, etc.)

4. How do you make decisions regarding the severity of DLD? Provide as much detail as possible.

Appendix C. A complete breakdown of all symptoms qualitatively reported by participants as being consistent or inconsistent with DLD and the exact percentage of participants who reported each symptom.

Profile 1:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses Total *n* = 126**
11th percentile score on a receptive language test/15th percentile score on an expressive language test.	75% (*n* = 94)
Difficulty with socialization.	41% (*n* = 53)
Parental concerns regarding word finding.	38% (*n* = 48)
Parental concerns regarding sentence formulation.	30% (*n* = 38)
General parental concerns/anxiety regarding language.	23% (*n* = 29)
Persistence of language issues despite previous intervention.	13% (*n* = 16)
No concerns regarding behaviour or attention in the classroom.	9% (*n* = 11)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses Total *n* = 84**
Difficulty with socialization.	36% (*n* = 30)
Borderline scores on receptive and expressive language tests.	13% (*n* =11)
No concerns regarding behaviour or attention in the classroom.	13% (*n* = 11)
Potential test anxiety.	4% (*n* =3)
All symptoms ARE consistent.	21% (*n* =18)

Profile 2:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses Total *n* = 125**
Persistent deficits despite two intervention periods.	73% (*n* = 91)
Low scores on two informal tests of narrative language.	55% (*n* = 69)
Lack of progress in the areas of vocabulary and language concepts.	12% (*n* = 15)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses Total *n* = 65**
Lack of information regarding other areas of language development	31% (*n* = 20)
Persistent deficits despite two intervention periods.	22% (*n* = 14)
All symptoms ARE consistent.	35% (*n* = 23)

Profile 3:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses Total *n* = 153**
2nd percentile score on receptive language test (lower than expressive).	74% (*n* = 113)
9th percentile score on expressive language test.	70% (*n* = 107)
Short, ungrammatical sentences in language sample.	44% (*n* = 67)
Difficulty following instructions in the classroom.	35% (*n* = 53)
Functional impact of language deficits.	15% (*n* = 23)
No other known biomedical conditions.	6% (*n* = 9)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses** **Total *n* = 144**
35th percentile score on a speech screening.	66% (*n* = 95)
Age <5 years.	14% (*n* = 20)
9th percentile score on expressive language test (higher than receptive language).	13% (*n* = 18)
All symptoms ARE consistent.	8% (*n* = 11)

Profile 4:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses** **Total *n* = 134**
Grammatical errors observed in spontaneous speech.	87% (*n* = 116)
Reported difficulty following directions.	43% (*n* = 58)
Reported difficulty understanding classroom vocabulary.	40% (*n* = 54)
Reported difficulty with narrative language.	34% (*n* = 46)
Observed difficulty communicating with peers (despite desire to interact).	30% (*n* = 40)
Teacher concerns regarding overall academic progress.	21% (*n* = 28)
Reported difficulty paying attention in class.	8% (*n* = 10)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses** **Total *n* = 103**
Desire/ability to socially engage with peers.	43% (*n* = 44)
Reported difficulty paying attention in class.	36% (*n* = 37)
Willingness to interact with clinician/observed response to clinician's scaffolding.	13% (*n* = 18)

All symptoms ARE consistent.	8% (*n* = 11)

Profile 5:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses Total *n* = 145**
10th percentile score on a formulating sentences language subtest.	68% (*n* = 98)
Concerns from the classroom teacher regarding written language skills.	46% (*n* = 67)
6th percentile score on a test of reading comprehension.	46% (*n* = 66)
4th percentile score on a test of non-word repetition.	35% (*n* = 50)
A documented history of SLP intervention prior to age five.	33% (*n* = 48)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses Total *n* = 133**
No observed errors in a language sample.	34% (*n* = 45)
36th percentile score on a recalling sentences language subtest.	32% (*n* = 42)
28th percentile score on a test of word definitions.	26% (*n* = 34)
Previous discharge from preschool speech and language services.	14% (*n* = 18)
Lack of comprehensive oral language testing.	14% (*n* = 18)
4th percentile score on a test of non-word repetition.	13% (*n* = 17)

Profile 6:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses Total *n* = 131**
Some vocabulary knowledge gaps in both L1 and L2.	54% (*n* = 71)

Disorganized narrative retell.	43% (*n* = 56)
Teacher concerns regarding L2 acquisition.	21% (*n* = 27)
NO symptoms are consistent	19% (*n* = 25)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses** **Total *n* = 137**
No reported parental concerns regarding acquisition of L1.	76% (*n* = 104)
Success during dynamic assessment.	59% (*n* = 81)
Limited exposure to L2 (2.5 years).	40% (*n* = 55)
Vocabulary knowledge in L1, L2 or both.	8% (*n* = 11)
ALL symptoms are inconsistent.	10% (*n* = 13)

Profile 7:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses** **Total *n* = 122**
Difficulty with following classroom instructions.	58% (*n* = 71)
Behavioural outbursts at times of frustration.	16% (*n* = 20)
Evidence of receptive language difficulty (i.e., attention, following directions).	12% (*n* = 14)
NO symptoms are consistent	22% (*n* = 27)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses** **Total *n* = 121**
Immediate success following implementation of clinician's strategy.	50% (*n* = 61)
Behavioural issues at times of transition.	28% (*n* = 34)

Engrossed play behaviour leading to attentional issues.	16% (*n* = 19)
No concerns regarding expressive language.	12% (*n* = 15)
ALL symptoms are inconsistent.	3% (*n* = 4)

Profile 8:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses Total *n* = 145**
4th percentile score on a test of morphology.	90% (*n* = 131)
Teacher concerns regarding word-finding difficulty.	19% (*n* = 28)
NO symptoms are consistent	16% (*n* = 23)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses Total *n* = 142**
Previous diagnosis of CAS/Articulation issues	82% (*n* = 116)
53rd percentile score on a test of receptive language.	60% (*n* = 85)
ALL symptoms are inconsistent.	3% (*n* = 4)

Profile 9:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses Total *n* = 119**
7th percentile score on a test of phonological awareness.	66% (*n* = 78)
Referral for below-grade-level reading ability.	22% (*n* = 26)
Lack of progress despite previous phonological awareness intervention.	9% (*n* = 11)
Concerns from parents and the classroom teacher.	4% (*n* = 5)

NO symptoms are consistent	20% (*n* = 24)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses Total *n* = 120**
Receptive and expressive language scores within normal limits (62nd and 48th percentile, respectively).	89% (*n* = 107)
Difficulties all linked to phonological awareness deficits (7th percentile).	21% (*n* = 25)

Profile 10:

Symptom reported as being *consistent* with a diagnosis of DLD	**# of Responses Total *n* = 108**
Concerns from the classroom teacher regarding oral and written language.	43% (*n* = 53)
11th percentile score on a formulating sentences language subtest.	42% (*n* = 51)
Concerns regarding his general language profile.	27% (*n* = 33)
14th percentile score on a sentence assembly language subtest.	22% (*n* = 27)
Comorbid diagnosis of ADHD.	5% (*n* = 6)
Concerns regarding observed function impact.	5% (*n* = 6)

Symptom reported as being *inconsistent* with a diagnosis of DLD	**# of Responses Total *n* = 122**
Comorbid diagnosis of ADHD.	66% (*n* = 71)
Concerns regarding reported history of trauma and unstable housing.	48% (*n* =52)
21st percentile score on a recalling sentences language subtest.	13% (*n* = 14)
Ability to successfully retell the main events of a story.	12% (*n* =13)
Ability to function well socially.	5% (*n* = 5)

Appendix D. A complete list of further information desired to aid in the diagnostic process in Chapter 4.

Profile 1:

Further information desired to aid in diagnosis	**# of Responses Total *n* = 100**
More robust language testing (e.g., word finding, vocabulary, narrative, etc.).	40% (*n* = 40)
Investigation of social communication skills.	39% (*n* = 39)
A more complete review of the child's medical and intervention history.	25% (*n* = 25)
Completion of an audiological assessment.	10% (*n* = 10)
Completion of a psychological/cognitive assessment.	9% (*n* = 9)
Investigation of play skills.	4% (*n* = 4)

Profile 2:

Further information desired to aid in diagnosis	**# of Responses Total *n* = 105**
More robust language testing (e.g., standardized testing).	78% (*n* = 82)
A more complete review of the child's medical and intervention history.	27% (*n* = 28)
Referral to either a psychologist or audiologist for further evaluation.	21% (*n* = 22)
Investigation of functional impact.	11% (*n* = 12)
More information from the child's caregiver.	5% (*n* = 5)

Profile 3:

Further information desired to aid in diagnosis	**# of Responses Total *n* = 133**
A more complete review of the child's medical and developmental history.	49% (*n* = 65)

More robust language testing (e.g., classroom observation, social communication and narrative language).	35% (*n* = 46)
Completion of an audiological assessment.	31% (*n* = 41)
Probing of response to intervention (because of the young age of the child).	17% (*n* = 23)
Referral to a psychologist for evaluation.	9% (*n* = 12)
More complete testing of receptive and expressive language skills.	8% (*n* = 10)

Profile 4:

Further information desired to aid in diagnosis	**# of Responses** **Total *n* = 117**
Completion of a full standardized assessment of receptive and expressive language abilities.	61% (*n* = 71)
A more complete review of the child's medical and developmental history.	37% (*n* = 43)
More robust language assessment (e.g., social communication, narrative language, response to intervention probing, etc.).	25% (*n* = 29)
Referral to a psychologist querying potential other conditions (e.g., ASD, ADHD).	15% (*n* = 18)
Completion of an audiological assessment.	14% (*n* = 16)

Profile 5:

Further information desired to aid in diagnosis	**# of Responses** **Total *n* = 125**
More robust language assessment (e.g., narrative language, vocabulary, reading comprehension, etc.).	51% (*n* = 64)
Probing of phonological awareness skills querying dyslexia.	25% (*n* = 31)
Referral to either a psychologist or audiologist for further evaluation.	15% (*n* = 19)
Investigation of functional impact.	10% (*n* = 13)

More information regarding previous preschool speech and language intervention and subsequent discharge.	8% (*n* = 10)
A more complete review of the child's medical and developmental history.	8% (*n* = 10)

Profile 6:

Further information desired to aid in diagnosis	**# of Responses** **Total *n* = 95**
More complete testing of L1.	26% (*n* = 25)
More robust language testing.	19% (*n* = 18)
A more complete review of the child's medical and developmental history.	19% (*n* = 18)
A longer period of progress monitoring.	17% (*n* = 16)
Comparison of performance on a specific task in L1 versus L2.	7% (*n* = 7)
Completion of an audiological assessment.	3% (*n* = 3)

Profile 7:

Further information desired to aid in diagnosis	**# of Responses** **Total *n* = 101**
More robust language testing (e.g., standardized tests of receptive and expressive language, social communication skills and literacy).	68% (*n* = 69)
Completion of an audiological assessment.	35% (*n* = 35)
A more complete review of the child's medical and developmental history.	20% (*n* = 20)
Referral to a psychologist or paediatrician for assessment querying ADHD and ASD.	15% (*n* = 15)
More information from the child's caregiver and classroom teacher.	9% (*n* = 9)

Profile 8:

Further information desired to aid in diagnosis	**# of Responses** **Total *n* = 86**
More robust language testing (e.g., phonological awareness and receptive morphology).	47% (*n* = 40)
More complete testing of expressive language skills (beyond morphology).	29% (*n* = 25)
A more complete review of the child's medical and intervention history.	20% (*n* = 17)
Reassessment of skills after a period of speech therapy or the introduction of an AAC device.	9% (*n* = 8)
Completion of an audiological assessment.	7% (*n* = 6)

Profile 9:

Further information desired to aid in diagnosis	**# of Responses** **Total *n* = 83**
More robust language testing (e.g., written language, reading comprehension, articulation, vocabulary, letter-sound knowledge, etc.).	43% (*n* = 36)
Investigation of possibility of dyslexia (through a wide variety of different methods from completing the TILLS to referring to other professionals).	22% (*n* = 18)
A more complete review of the child's medical and developmental history.	15% (*n* = 12)
Referral to a psychologist for a psychoeducational assessment.	15% (*n* = 12)
Probing of response to intervention.	6% (*n* = 5)
Completion of an audiological assessment.	6% (*n* = 5)
More education regarding the potential interaction between phonological awareness and DLD.	6% (*n* = 5)

Profile 10:

Further information desired to aid in diagnosis	**# of Responses** **Total *n* = 100**
More robust language testing.	53% (*n* = 53)
More complete review of child's medical/developmental/educational history.	34% (*n* = 34)
Review of how current ADHD management.	24% (*n* = 24)
Probing of response to intervention.	13% (*n* = 13)
Probing of social communication skills.	13% (*n* = 13)
Referral to either a psychologist or audiologist for further evaluation.	12% (*n* = 12)
More complete testing of literacy skills.	11% (*n* = 11)

Curriculum Vitae

Name: Alyssa Kuiack

Education:

In progress	Ph.D Health and Rehabilitation Sciences, University of Western Ontario Advisor: Dr. Lisa Archibald
In progress	M.Cl.Sc Speech-Language Pathology, University of Western Ontario
2015	Bachelor of Arts, Psychology, Huron University College, University of Western Ontario Thesis: Infants' Sensitivity to Fine Durational Cues in Speech Perception

Honours Awarded:

2012-2015, 2017-2021	Dean's Honour List, University of Western Ontario
2015	The Dr. Moira Sansom Award for Excellence in Psychological Research, Huron University College
2015	Canadian Psychological Association Certificate of Academic Excellence, Huron University College

Peer-Reviewed Publications:

Kuiack, A. & Archibald, L. M. D. (2021). Investigating label use by Canadian speech language pathologists. *Canadian Journal of Speech-Language Pathology and Audiology, 45* (3).

Kuiack, A. & Archibald, L. M. D. (2019). Developmental language disorder: The childhood condition we need to start talking about. *Frontiers in Young Minds, 7* (94). doi: 10.3389/frym.2019.00094.

Kuiack, A. (2015). Infants' Sensitivity to Fine Durational Cues in Speech Perception. *Undergraduate Honours Theses.* Paper 12. http://ir.lib.uwo.ca/psych_uht/12.

Kuiack, A. (2013). The baby schema's effect on motor dexterity. *The Huron College Journal of Learning and Motivation, 51* (1).

Pham, T., Bardell, T. E., Vollebregt, M., **Kuiack. A. K.,** & Archibald., L. M. D.

Evaluating the Modified-Shortened Token Test as a working memory and language assessment tool. Journal of Speech, Language, and Hearing Research

Conference Presentations:

Symposium of Research in Child Language Disorders 2022
The University of Wisconsin, Madison, Wisconsin
- Poster presentation: Identifying and Describing Developmental Language Disorders in Children

First International Developmental Language Disorder Research Conference 2021
- Virtual presentation: Identifying Developmental Language Disorder (DLD) in Children

Symposium of Research in Child Language Disorders 2021
The University of Wisconsin, Madison, Wisconsin
- Virtual presentation: Identifying Developmental Language Disorder (DLD) in Children

Society for the Scientific Study of Reading 2019
Toronto, Ontario
- Poster presentation: The Grade One Language and Literacy Project: A Collaboration Between Speech-Language Pathologist and Educators

Faculty of Education Research Partners Day 2019
Western University, London, Ontario
- Oral presentation: Partnerships for Practice-Based Research in Educational Speech and Language Services

Symposium of Research in Child Language Disorders 2019
The University of Wisconsin, Madison, Wisconsin
- Poster presentation: The Grade One Language and Literacy Project: A Collaboration Between Speech-Language Pathologist and Educators

Speech and Hearing British Columbia Conference 2018
Victoria, British Columbia
- Research presented orally by supervisor Dr. Lisa Archibald: Developmental Language Disorder: Applying the Consensus Terminology in Practice

Symposium of Research in Child Language Disorders 2018
The University of Wisconsin, Madison, Wisconsin
- Poster presentation: Investigating Label Use by Canadian Speech-Language Pathologists

Huron University College Faculty Research Day 2015
Huron University College, London, Ontario
- Oral presentation: Infants' Sensitivity to Fine Durational Cues in Speech Perception

Ontario Psychology Undergraduate Thesis Conference 2015
Western University, London Ontario
- Oral presentation: Infants' Sensitivity to Fine Durational Cues in Speech Perception

Professional Experience:

2023	Course Instructor COMMSCI 9618 (Developmental Language Disorders 1), University of Western Ontario
2022	Course Instructor COMMSCI 9638 (Developmental Language Disorders 2), University of Western Ontario
2022	Student Clinician (Speech-Language Pathology), Oxford Speech Plus
2022	Student Clinician (Speech-Language Pathology), Thames Valley District School Board
2022	Graduate Teaching Assistant, COMMSCI 9631 (Voice Disorders), University of Western Ontario
2022	Graduate Teaching Assistant, COMMSCI 9650 (Resonance and Resonance Disorders), University of Western Ontario
2021	Student Clinician (Speech-Language Pathology), Parkwood Institute
2020	Graduate Teaching Assistant, COMMSCI 9649 (Evidence-Based Practice: Principles and Techniques), University of Western Ontario
2020-2021	Graduate Teaching Assistant COMMSCI, 9633 (Swallowing and Dysphagia), University of Western Ontario
2019	Graduate Teaching Assistant COMMSCI 9613, (Language Acquisition), University of Western Ontario
2017-2021	Student Clinical Supervisor (Speech-Language Pathology), Wise Words/ Leaps to Literacy, University of Western Ontario
2017-2019	Student Clinician (Speech-Language Pathology), H.A. Leeper Clinic, University of Western Ontario
2015-2017	Research Assistant for Dr. Christine Tsang, Huron University College

Professional Service:

2015-2017	Sponsored Learner at London Health Sciences Centre**,** Department of Speech-Language Pathology

2015-2017	Volunteer for a Speech-Language Pathologist, Thames Valley District School Board, London, Ontario
2016	Volunteer Speech Therapist and Tutor, London, Ontario
2010-2017	Classroom Volunteer, Thames Valley District School Board, London, Ontario