The Effects of PLEASE on the Writing Performance of High-school Students with High Functioning Autism Spectrum Disorder

by

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We acknowledge with respect the Lekwungen peoples on whose traditional territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

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Abstract

Students with Autism Spectrum Disorder (ASD) often require academic support to participate in the inclusive classroom. SRSD writing interventions have proven to be effective on this population. As there is a gap in the literature regarding the effectiveness of SRSD writing interventions on high-school students with ASD, this study employed a single-case design (SCD) to investigate the implementation of PLEASE paragraph-writing on two high-school students with high-functioning ASD. Response to intervention was assessed with pretest and posttest measures and with progress monitoring across intervention sessions. Data analysis included Percentage of Non-Overlapping Data (PNDs) and visual inspection of the line. Results indicated that PLEASE was very effective in improving the student's writing and planning skills regarding theme development and organization, and draft-writing and self-monitoring respectively. Results of this study are discussed in relation to existing literature on SRSD, writing interventions, and ASD. Implications for educators and professionals working with high-school students identified with ASD and writing difficulties are discussed.

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"Diversity is being invited to the party. Inclusion is being asked to dance."

Vernā Myers, Inclusion Advocate

Introduction

The present study will focus on the efficacy of Self-Regulated Strategy Development (SRSD) writing interventions on adolescent students with Autism Spectrum Disorders (ASD) who face writing difficulties. First, I will discuss ASD and present its characteristics, intervention and treatment approaches that research has identified. I will also discuss the current policies and regulations in British Columbia (BC) and Canada that relate to ASD, writing, and academic success. Second, I will discuss writing and present theories of writing development, the development of writing in adolescents, and the specific characteristics that writers with ASD who struggle with writing present. Third, I will review the SRSD model of instruction, and the efficacy of SRSD writing interventions across populations with different characteristics who present writing difficulties. Finally, I will discuss gaps in the literature and I will present the research questions addressed by the present study.

Undoubtedly, writing is a crucial skill that can help individuals achieve a variety of goals. It provides a medium for communicating with family, friends, and colleagues, and people use it to gather, preserve and transmit information, regardless of time and space. In BC, writing is an important component of the curriculum across subjects and grades. Specifically, it is stated that essential learning, literacy (including writing) and numeracy foundations, and core competencies are the base of the new BC curriculum (BC Government, 2018). Students with ASD are expected to meet the academic demands in content-area instruction and make progress in these academic domains. There is limited research on evidence-based interventions to support students with ASD in the inclusive classroom (Spencer, et al., 2014). Behavioural, social, and functional needs of students with ASD have historically taken precedent; the number of students with high functioning autism following the general curriculum indicate that a focus on the academic skills of these students is crucial to their success (Spencer et al., 2014). Therefore, in the following sections, I will

present a review of the literature regarding writing interventions for students with ASD, illustrate gaps in the current literature, and present an overview of the PLEASE strategy. Following this overview of the literature, the study's research questions will be presented.

Autism Spectrum Disorder

Autism as a diagnostic term was first used by Leo Kanner in 1943. In his study "Autistic Disturbances of Affective Contact," Kanner introduces Autism as a diagnostic concept instead of a symptom, separating it from schizophrenia. He highlights the extreme autistic aloneness and the obsessive desire for the maintenance of the sameness as the main characteristic of the disorder, together with self-sufficiency, inability to relate to the environment, lack of social awareness, excellent rote memory, literalness, echolalia, fear of loud noises, and repetitive behaviors (Kanner, 1943). To date, research supports the validity of autism as a specific diagnostic concept. Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder with an onset in early development. Its characteristics are significant and persistent deficits in social interaction and communication skills, and stereotyped patterns of behaviours, activities and interests (Mash & Wolfe, 2016).

The Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM–5) (American Psychiatric Association, 2013), defines autism as a spectrum disorder with diagnostic criteria grouped into two categories. These categories are in accordance with autism's hallmarks, as Kanner identified them back in 1943: social communication and interaction deficits, and restricted, repetitive patterns of behaviour, interests, or activities (American Psychiatric Association, 2013). Social communication deficits include deficits in social-emotional reciprocity, in non-verbal communicative behaviors, and in developing, maintaining, and understanding relationships (American Psychiatric Association, 2013). Restricted interests and repetitive behaviors include stereotyped or repetitive motor movements, use of objects, or speech, inflexible adherence to routines or ritualized patterns of behaviour, fixated interests that are abnormal in intensity or focus, and hyper- or hypo-reactivity to sensory input (American Psychiatric Association, 2013). The severity level of each one of the two categories is ranked separately as "requiring support" (level 1),

"requiring substantial support" (level 2), and "requiring very substantial support" (level 3), with the recognition that severity may vary by context and fluctuate over time (American Psychiatric Association, 2013, p. 50). There are three more diagnostic criteria that need to be met for an ASD diagnosis: (a), the symptoms must be apparent in the early developmental period, (b) the symptoms cause clinically significant impairment in important areas of daily functioning, and (c) these deficits are not better explained by intellectual disability or global developmental delay (although ASD and intellectual disability can co-occur; American Psychiatric Association, 2013).

It is important to highlight the changes from DSM-IV-TR to DSM-5 regarding ASD. DSM-5 (American Psychiatric Association, 2013) specifies that individuals who had an established DSM-IV diagnosis of the following developmental disorders should be given the diagnosis of ASD: (a) Autistic Disorder, whose features were a markedly abnormal or impaired development in social interaction and communication and a markedly restricted repertoire of activities and interests (American Psychiatric Association, 2000); (b) Asperger's disorder, whose essential features were abnormal or impaired development in social interaction and communication and a markedly restricted repertoire of activities and interests, but in contrast with Autistic disorder, it had no clinically significant delays or impairment in language acquisition, and no clinically significant delays in cognitive development during the first three years of life (American Psychiatric Association, 2000); and (c), pervasive developmental disorder not otherwise specified (PDD-NOS), a diagnostic category that included atypical autism, which was used when there was a severe and pervasive impairment in the development of reciprocal social interaction due to impaired verbal or non-verbal communication skills or due to stereotyped patterns of behaviour that did not meet the diagnostic criteria for specific Pervasive Developmental Disorder, Schizophrenia, Schizotypal Personality Disorder, or Avoidant Personality Disorder (American Psychiatric

Association, 2000). In essence, ASD is a new DSM-5 disorder that encompasses the DSM-IV autistic disorder, Asperger's disorder, childhood disintegrative disorder, Rett's disorder, and PDD-NOS (American Psychiatric Association, 2013). The notion of autism as a spectrum disorder reflects the homogeneity in the core impairments, as well as the continuum of variability in the clinical presentation of these deficits (Vivanti, 2015). The revised criteria relate importantly to the language domain, since the requirement of a delay in language development has been removed. ASD is characterized by (a) deficits in social communication and social interaction, and (b) restricted repetitive behaviours, interests, and activities (RRBs) (American Psychiatric Association, 2013). Because both components are required for diagnosis of ASD, social (pragmatic) communication disorder, a new DSM-5 condition is diagnosed if no RRBs are present, which involves persistent difficulties in the social uses of verbal and non-verbal communication (American Psychiatric Association, 2013). An understanding of the differences between DSM-IV and DSM-5 autism-related diagnoses is important to this study to better understand the rational of the present study's participants, as it is described in the methods section of this paper.

The etiology of ASD relates to both genetic and environmental factors. Although there is incontrovertible evidence that ASD results from an interaction between environmental and genetic factors, "the exact mechanisms that underlie the homogeneity and the heterogeneity observed in ASD are largely unknown" (Vivanti, 2015, p. 277). The onset and developmental course of ASD occurs in two patterns, (a) the early onset pattern, where developmental abnormalities appear from infancy, and (b), the regressive autism pattern, where a child develops normally during early childhood but then loses previously acquired social and communicative skills (Vivanti, 2015; American Psychiatric Association, 2013).

ASD and Treatment

The Interactive Autism Network has estimated that there are approximately 400 different treatments for individuals with ASD (Mash & Wolfe, 2016). To date, research suggests that there is no known cure for this disorder. Some self-advocacy organizations question the need to treat ASD, as they view it as a way of being in the world (Vivanti, 2015). The goal for most existing treatments is to minimize the core impairments of ASD, so that the individual will grow to be an independent adult who is able to establish relationships, develop professionally, and be fully included in the society (Mash & Wolfe, 2016). The most effective interventions for ASD are behavioural and educational, with medication having only a minor role (Lai et al., 2014). Research also suggests the importance of early intervention to predict better future outcomes (Lai et al., 2014). Most early interventions follow a learning/behavioural model, a structured teaching model, or a developmental and relationship approach, and they usually aim to reduce disruptive behaviours, teach appropriate social behaviour and communication skills, and improve executive functioning (Mash & Wolfe, 2016). Much less research has been conducted on evaluating the efficacy of academic interventions with students with ASD.

ASD Policies and Regulations in BC, Canada

The BC Ministry of Education defines Autism Spectrum Disorder as "a life-long developmental disability that prevents people from understanding what they see, hear, and otherwise sense. This results in severe problems with social relationships, communication, and behavior"(BC Ministry of Education, 2000, p. 3). People with ASD can present different levels of intelligence, with severity ranging from mild to severe. In the BC education and policy manuals, this range is often referred to as high-functioning autism to low-functioning autism (BC Ministry of Education, 2000). In Canada, inclusive education mandates and initiatives are federally supported through the Canadian Charter of Rights and Freedoms and

through provincial education acts, with similar legislative backing in countries throughout the world (DeLuca, 2013). More specifically, the Canadian Charter of Rights and Freedoms states that all people in Canada, including children, have certain rights. Equality, one of these rights, is stated in Section 15 (1): "Every individual is equal before and under the law and has the right to the equal protection of the law, without discrimination and in particular, without discrimination based on… mental and physical disability" (Canadian Charter of Rights and Freedoms, 1982).

Additionally, in 1991, Canada ratified the United Nations Convention of the Rights of the Child. Article 23(3) states:

> Recognizing the special needs of a disabled child, assistance extended in accordance with paragraph 2 of the present article shall be provided free of charge, whenever possible, taking into account the financial resources of the parents or others caring for the child, and shall be designed to ensure that the disabled child has effective access to and receives education, training, health care services, rehabilitation services, preparation for employment and recreation opportunities in a manner conducive to the child's achieving the fullest possible social integration and individual development, including his or her cultural and spiritual development.

BC has an inclusive educational system. Inclusion describes the principle that all students are entitled to equitable access to learning, achievement and the pursuit of excellence in all aspects of their educational programs (BC Government, 2006). However, inclusion is not necessarily synonymous with full integration in regular classrooms, and goes beyond placement to include meaningful participation and the promotion of interaction with others (BC Government, 2006). Therefore, students with special needs, including students with ASD, have guaranteed access to education in classrooms alongside their same-age peers. An Education Board must ensure that an Individual Education Plan (IEP) is designed for a

student with special needs as soon as the student is identified as having special needs (BC Government, 2006). The student's IEP documents the educational goals, special educational needs, assessments, interventions, accommodations and all the adaptations and/or modifications that the student might need (BC Government, 2006). The inclusive educational system and the expectation that students with autism will follow the general curriculum highlights that the focus on the academic skills of these students is crucial to their success (Spencer et al., 2014).

Section Summary

ASD is a spectrum disorder characterised by social communication deficits and restricted, repetitive patterns of behaviour and interests. ASD presents homogeneity in the core impairments and great variability in the clinical presentation of these deficits. Although there is no cure for ASD, there are interventions and supports available to help individuals with ASD become independent adults and be included in the society. As BC has an inclusive educational system, it is important to identify ways to support students with ASD in a general education setting.

Writing

Writing is an important and complex skill, which highlights the need to research effective interventions for struggling writers. Writing is a requisite skill for education and it is used for both learning and assessment purposes (Graham & Fulton, 2015; Graham et al., 2013). In their professional life, most individuals are required to use writing on a daily basis across professions, while at home, writing is now a part of everyday life because of social media, emailing, texting, and other forms of digital composing (Graham & Fulton, 2015). To situate the present study in the writing intervention field, it is essential to establish a theoretical basis. Thus, in the following section, I first discuss the cognitive processes involved in writing, and then will present the Simple View of Writing as the theoretical model used in this study after I briefly discuss the models that preceded its conceptualisation.

Cognitive Processes behind Writing

Contemporary research on writing suggests that the cognitive processes of transcription (the ability to transcribe the words one wants to say into written symbols on the page, i.e. handwriting, keyboarding, and spelling; MacArthur & Graham, 2006), working memory (the capacity to hold varying amounts of information in memory while processing; MacArthur & Graham, 2006), self-regulation (a self and goal-directed behaviour involving a variety of strategies for regulating the writing process, the writer's behaviour, and the writing environment to achieve the goals that the writers set for themselves; MacArthur & Graham, 2006), and motivation (the cognitive process of being moved to do something; Ryan & Deci, 2000) play a crucial role in the writing process (MacArthur, Graham, & Fitzgerald, 2006). The first influential model of writing was proposed by Hayes and Flower in 1980. Hayes and Flower's 1980 model was the first one to investigate the cognitive processes that are involved in writing. Their model included three basic components: task environment (e.g., topic, audience, and motivating cues), cognitive processes (e.g., planning, translating plans into

written text, and reviewing to improve existing text), and the writer's long-term memory (vast stores of knowledge and experience acquired in the past, e.g., knowledge about the topic, the intended audience, and general plans or schemas for accomplishing various writing tasks; Hayes, 2012; MacArthur & Graham, 2006). Hayes revised this model in 1996 to incorporate other cognitive processes and factors involved in writing, such as motivation, the writing context, and working memory, and revised the original cognitive processes into the broader categories of reflection, text production, and text generation (Hayes, 2012; Wagner et al., 2011).

Taking into consideration the executive functions in Hayes and Flower's model, Berninger et al. (2002) synthesized educational, cognitive, linguistic, developmental, and neuropsychological components from the field of writing research to create a theoretical model on writing called Simple View of Writing, and recognized that most skills of the functional writing system are either executive functions or self-regulatory skills (Berninger et al., 2002; Berninger & Amtmann, 2003; Tolchinsky, 2006). As executive functions and self-regulation are two concepts essential to the theoretical model itemized in this study, an explanation of executive functions and self-regulation will first be provided, and then the Simple View of Writing will be presented. Executive functions as a term refers to the higher order control processes necessary to guide behaviour in a constantly changing environment; it includes abilities such as planning, working memory, mental flexibility, response initiation, response inhibition, impulse control and monitoring of action (Robinson et al., 2009).

Self-regulation can be defined as goal-directed behaviour, typically enacted within a certain amount of time, and it entails (a) ideals of thought, feeling, or behaviour that individuals endorse, mentally represent, and monitor; (b) sufficient motivation to invest effort into reducing discrepancies between ideals and actual states; and (c) sufficient skills to achieve this despite the obstacles and temptations that one will encounter (Hofmann et al.,

2012). With respect to writing, Zimmerman and Risemberg's (1997) social-cognitive view of writing places self-regulatory processes in a central position. According to Zimmerman and Risemberg (1997), these processes can be grouped into three major categories of self-regulatory influence: (a) environmental processes, which refer to writers' self-regulation of the physical or social setting in which they write; (b) behavioural processes, which pertain to writers' self-regulation of overt motoric activities associated with writing; and (c) personal processes, which involve the writer's self- regulation of cognitive beliefs and affective states associated with writing (Zimmerman & Risemberg, 1997). This triadic system of self-regulatory processes is closely linked to self-efficacy, which in the context of writing research refers to perceptions of one's own capabilities to plan and implement actions necessary to attain designated levels of writing on specific tasks (Zimmerman & Risemberg, 1997). As they employ these self-regulatory strategies, writers monitor, evaluate, and react to their use of them, and from the consequences of their actions, they learn how to become better writers and develop their writing skills (MacArthur & Graham, 2006). These behaviours have an important effect on a writer's motivation and self-efficacy. A writer's sense of efficacy can be enhanced or diminished depending on the perceived success of the strategies, while self-efficacy influences intrinsic motivation for writing, the use of self-regulatory processes during writing, and eventual literacy attainment (MacArthur & Graham, 2006).

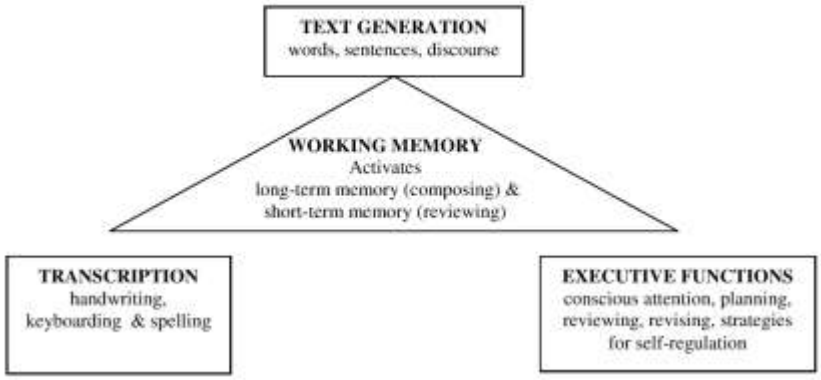
The Simple View of Writing

The specific skills and processes that are the core components of the Simple View of Writing, as presented by Berninger and Amtmann (2003) are: (a) transcription, which involves the use of writing skills such as handwriting, keyboarding, and spelling (MacArthur & Graham, 2006); (b) working memory, which is the capacity to hold varying amounts of information in memory while processing it (MacArthur & Graham, 2006); (c) discourse

knowledge; (d) planning, which is a discrete stage in the production of a document and it involves forms of representation different from that in which the final output will appear (Torrance, 2006); (f) revising, which involves reading and editing the text that one has written in order to achieve the set goals or the desirable outcome (Harris et al., 2008; MacArthur et al., 2006); and (g) strategies for the executive functions for self-regulating these cognitive processes during writing. Figure 1 visually represents the way these skills interact during writing:

Figure 1

The Simple View of Writing (Berninger & Amtmann, 2003).



In this framework, the writing process is represented as a triangle encompassing a short-term, working, and long-term memory environment. Long-term memory contains vast stores of knowledge and experience acquired in the past, including in the case of writing, knowledge of content, writing forms and qualities, audiences and social situations, language, writing strategies, transcription skills, and many other topics, while short-term memory refers to time-based and item-based limits in one's memory, such as the limit in the number of items that one can remember for a specific period of time (Cowan, 2017). At the left base of the triangle is transcription, which includes handwriting, keyboarding, and spelling. At the right base of the triangle are executive functions, which include conscious attention, planning,

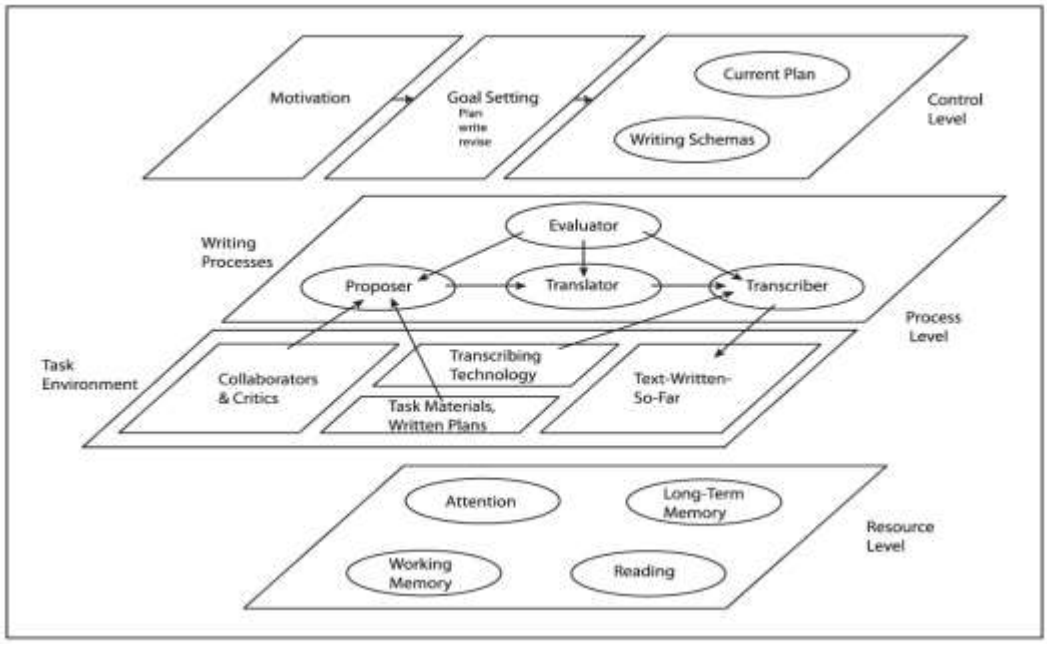
reviewing, revising, and strategies for self-regulation. Both transcription and executive functioning skills support text generation (words, sentences, discourse) which is at the vertex of the triangle. At the center of the triangle coordinating all these processes is working memory, which activates long-term memory during composing and short-term memory during revising (Berninger & Amtmann, 2003). Text generation draws on long-term memory for idea generation, and then these ideas are translated into language representations in working memory (Berninger et al., 2002). Text generation also draws on transcription skills, which the writer uses to translate the language representations created in the working memory into orthographic symbols using pencil, pen, or keyboard (Berninger et al., 2002). All the skills involved in the writing process are equally important. However, depending on the developmental stage of each writer, different processes will place a more or less influential constraint in the writing process.

Hayes' 2012 Model

It is important to discuss Hayes' 2012 model of writing, as it is the most recent update of the influential 1980's model. Hayes developed it taking into consideration,

Figure 2

Hayes' 2012 Model of Writing



amongst other studies, Berninger's research on writing processes, skills, development, and the Simple View of Writing (Hayes, 2012). It accounts better for the role of motivation and transcription compared to previous models (Hayes, 2012), and both skills are central to the Simple View of Writing and SRSD. Its purpose is to view the skills involved in writing as the result of different subprocesses that are interacting to complete a writing task, and each one does part of the writing job but cannot do the whole job (Hayes, 2012). This framework assumes that these processes as well as the skills involved in the writing process can be developed through experience and instruction, such as writing interventions (Hayes, 2012).

Figure 2 shows Hayes' 2012 model, which is divided into three levels: (a) the control level, which includes the subprocesses of motivation, goal setting, as well as the current writing plan and writing schemas; (b) the process level, which includes two sub-levels: writing processes (evaluator, proposer, translator, transcriber), and task environment (collaborators and critics, task materials and written plans, transcribing technology, and text written so far); and (c), the resource level, which includes the processes of attention, working memory, long term memory, and reading (Hayes, 2012). This latest model underlines the importance of transcription including spelling and orthography in the development of writing as an important component in both adults and children, as it competes with other writing processes for cognitive sources (Hayes, 2012). Hayes (2012) also highlights the importance of motivation, since it affects whether people will write, how long they write, and how much they attend to the quality of what they write. The 2012 model generally captures the impact of motivation on goal-setting, but further revisions of the model and research are needed to suggest how motivation may influence transcription or evaluation (Hayes, 2012). Notably, task schemas for various writing tasks (e.g., revising, collaborating, summarizing) are presented as part of the control level but are presumably stored in long-term memory (Hayes, 2012).

It is noteworthy that in Hayes' 2012 model, planning and revising are not viewed as cognitive sub-processes of writing, but as special applications of the writing model, as opposed to the Simple View of Writing, where planning and revising are sub-processes of the executive functions end of the triangle. According to Hayes (2012), planning entails goal setting, generating ideas, evaluating, and translation and transcription to produce a written product, a plan, that helps the author of the plan to produce another text, and therefore, planning becomes part of the task environment (Hayes, 2012). Plans that are not written down are stored in memory and involve the proposer, the evaluator, and the translator (Hayes, 2012). As far as revising is concerned, it is also viewed as a specialized writing activity because it starts with the detection of a problem in an existing written text, planning the solution to the problem (in written form or not), translating that solution into language, and transcribing that language into new text (Hayes, 2012). This conceptualization of planning and revising aligns with the way these two skills are treated by the SRSD model of instruction which is itemized in the present study, since plan-making and revising have to be modeled and explicitly taught to the student as separate skills, or distinct steps in the process of producing a written composition of good quality (Harris et al., 2008)

Writing Development

Written language development is a well-established domain of inquiry in cognitive psychology, but this knowledge is fragmented along lines of theory, method, age range, or populations studied, with little done to create an integrated picture of writing development as a multidimensional process that continues across the lifespan (Bazerman et al., 2017). Researchers agree that writing is a multidimensional undertaking that requires using various developmental skills simultaneously and therefore, becoming a skilled writer requires mastery of all levels of linguistic knowledge (Abbott & Berninger, 1993; Bazerman et al., 2017; Tolchinsky, 2006). Neurodevelopmental, linguistic, and cognitive constraints operate

at all stages of writing development, however different skills have a more influential role at different developmental stages (Abbott & Berninger, 1993).

Early Developing Writers, Grades 1-4

Neurodevelopmental constraints are the most influential in early grades (Abbott & Berninger, 1993). According to the Simple View of Writing as well as Hayes' 1980, 1996, and 2012 model, early in writing development, lower-level skills play an important role. More specifically, transcription provides the foundation from which writing springs, while executive functions are dependent on the guided assistance from parents, teachers, and peers, which is called "other-regulation"(Berninger & Amtmann, 2003, p. 350). As transcription skills gradually become automatized through instruction and practice, more attentional capacity is available for the text generation process (Abbott & Berninger, 1993). Orthography and phonology skills, which constitute spelling, are also lower level skills that are being developed and automatized during the early grades (Abbott & Berninger, 1993). It needs to be noted that linguistic constraints are also apparent here, as handwriting is fundamentally a linguistic act (producing alphabet symbols on the motor output channel to produce words; Abbott & Berninger, 1993). A characteristic of the writing products of this period is that early developing writers retrieve any information that is somewhat appropriate from their long-term memory and write it down, with each preceding sentence or phrase acting as stimulus for the next idea (Graham & Harris, 2000).

From Developing to Skilled Writers

Linguistic constraints appear to be more influential in the intermediate grades as handwriting and spelling become more and more automatized, and cognitive constraints in the junior-high grades (Abbott & Berninger, 1993). The Simple View of Writing predicts that spelling determines to a large extent writing ability during the early years of writing development, while executive functions and text generation become progressively more

important, once spelling has become automatized (Tolchinsky, 2006). Research suggests that hand-writing fluency highly predicts the quality of written text organization (e.g., the presence of a topic sentence, logical ordering of ideas, and organization in a main idea, body, and conclusion; e.g., Wagner et al., 2011), as well as the writer's productivity (word count and number of different words used; e.g., Wagner et al., 2011). Wagner et al. (2011) showed that between grades one and four, as young writers acquire handwriting fluency, text organization and written productivity nearly double. This suggests that an individual who is fluent at handwriting fluency has more attentional resources that can be devoted to planning and composing (Wagner et al., 2011). Thus, as the lower-level skills related to writing become automatized, higher-level self-regulatory skills start to develop, moving from other-regulation to self-regulation (Berninger & Amtmann, 2003). Research suggests that planning and revising skills gradually increase from early to later grades (e.g., grades six to eight) with students making more planning notes, increasing conceptual planning, and revising more often and larger units of texts (Graham & Harris, 2000). At this stage, the more students develop their cognitive skills (high-level writing) skills, the more skilled they become in writing. Skilled writers are more self-regulated than less skilled writers, they allocate more time for planning and revising, and they often exhibit self-initiated strategies for controlling environmental, behavioural, and personal processes (Graham & Harris, 2000). In an educational context, students are likely to learn those genres, skills, and strategies that they experience in school and less likely to learn those that are ignored or rejected (Bazerman et al., 2017).

Through a combination of brain maturation and academic instruction, young writers learn to regulate the executive functioning processes themselves and develop their writing skills (Berninger & Amtmann, 2003). Thus, writing instruction holds a key-role in writing development. When educators are teaching writing strategies, it is important to take into

consideration the current writing level of the student, the expectations of the curriculum in use, the socio-educational context and the resources available (Bazerman et al., 2017), and consequently, with respect to special education, the developmental challenges that a child with a neurodevelopmental disorder may be facing. Therefore, since this study will focus on struggling writers with ASD, it is important to review the literature to examine if individuals with ASD present specific patterns of writing difficulties that should be taken into consideration.

Section Summary

Writing is an important and complex skill. The Simple View of Writing is a writing model that discusses the various skills and cognitive processes involved in writing. Transcription skills, executive functions, and working memory collaborate and result in text generation. Neurodevelopmental, linguistic, and cognitive constraints operate at all stages of writing development. However, as lower-level skills like transcription and spelling become automatized (grades one to four), students have more attentional capacity to use and develop their higher-level skills, such as planning, revising, self-monitoring, and self-regulation. Students become skilled writers through a combination of brain maturation, academic instruction, and practice. Thus, effective writing instruction is essential to writing development.

Writers with ASD

Although there are some studies that have investigated the effectiveness of writing interventions for students with ASD (Asaro-Saddler, 2016; Pennington & Delano, 2012), research on the development of writing skills and the writing characteristics for this group is sparse. Amongst the primary deficits that have been hypothesized to underlie ASD include difficulties in (a) theory of mind, (b) central coherence, and (c), executive functioning (Vivanti, 2015). This section will first illustrate the way these three deficits may impact the writing skills of students with ASD and present the findings of the sole published meta-analysis that examines the characteristics of written expression in individuals with ASD.

Theory of mind is the ability to attribute mental states to others, for example how they think, feel, and interpret the world around them (Grossman et al., 2013; Vivanti, 2015). Research suggests that this difficulty could be the reason why some writers with ASD face challenges in anticipating the needs of their reader and taking perspective while writing, as well as writing for an absent audience (Asaro-Saddler & Bak, 2014; Brown & Klein, 2011). This difficulty results in a written text that readers perceive it as poor (Brown & Klein, 2011; Grossman et al., 2013). Additionally, writers with ASD often present weak central coherence (Brown & Klein, 2011; Vivanti, 2015). This is evident in writing as a detail-focused processing style, where information is processed in terms of constituent parts rather than global coherence (e.g., the sequence between one main point or argument to another may seem irrelevant, or may not seem to support the overarching main idea of the essay; Brown & Klein, 2011). Brown and Klein (2011) found significant differences between typically developing (TD) writers and writers with ASD in the global and local coherence of their essays.

With respect to the Simple View of Writing (Berninger & Amtmann, 2003), executive functioning difficulties in writing may be observed as difficulties in planning, conscious

attention, reviewing, revising, monitoring, and self-regulation. There is a body of research suggesting that executive functions and writing achievement are highly related, and that interventions that target the executive functions of planning, reviewing, revising, monitoring, and self-regulation in writing improve the writing achievement of students with difficulties in writing, including students with ASD (Asaro-Saddler, 2016; Asaro-Saddler & Saddler, 2010; Berninger & Amtmann, 2003; Cook & Bennett, 2014; Harris et al., 2008; MacArthur & Graham, 2006; MacArthur & Philippakos, 2010; Mason & Shriner, 2008; Taft & Mason, 2011; Tolchinsky, 2006; Zimmerman & Risemberg, 1997).

Recently, Finnegan and Accardo (2018) conducted the first meta-analysis on the writing ability of individuals with ASD. The purpose of their study was to compare the written expression of individuals with ASD and their TD peers through the examination of the existing research. They found that when comparing writers from the ASD group with the TD group, there were significant differences in performance in the following components: (a) length, (b) handwriting fluency with respect to both legibility and speed (e.g. number of letters written in a given time frame), (c) size of letters written, (d) spelling, and (e) structure. Taking into consideration the developmental deficits of individuals with ASD, the Simple View of Writing, and the way TD writers develop their skills as discussed in the previous sections, these findings are consistent with the literature. As far as handwriting fluency is concerned, individuals with ASD scored significantly lower on legibility, their written letters were significantly larger, and they wrote significantly slower (Finnegan & Accardo, 2018). As discussed above, handwriting fluency predicts written text organization (presence of topic sentence, logical order of ideas) and productivity (word count and different words used; Abbott & Berninger, 1993). Thus, developmentally, the lower scores on handwriting fluency of the ASD group predict their lower performance on word count and text structure. Additionally, according to the Simple View of Writing, as transcription becomes

automatized, there is more attentional capacity available for executive functions like self-regulation, planning, monitoring, and revising. This information is useful to educators working with struggling writers with ASD, since it demonstrates the need to consider the developmental stage of their students (overall and in writing) as well as their individual writing profile when choosing or designing interventions.

Importantly, even when early developing writers with ASD automatize the lower-level writing skills and start transitioning to an intermediate writing level, higher-level writing skills, which develop through instruction and brain maturation (Berninger & Amtmann, 2003), may be challenging to develop, since one of the main deficits of individuals with ASD lays in their executive functioning skills (Vivanti, 2015). Therefore, the instruction of executive functioning skills that relate to writing (e.g., planning, goal-setting, monitoring, and revising) is important for secondary and high-school students with ASD. As the present study will focus on students with high-functioning autism, it is important to highlight that research suggests that the majority of children with high-functioning autism present writing difficulties, including both difficulty with handwriting and difficulty expressing thoughts on paper (Dickerson & Calhoun, 2008). Effective interventions available include writing strategy instruction, such as teaching explicit strategies for planning and writing compositions using question prompts and mnemonics with guided feedback and self-regulatory procedures; or, in other words, interventions that target the executive functions component of writing according to the Simple View of Writing. In the following section, I will review the literature on effective writing interventions for students with ASD.

Writing Interventions for Individuals with ASD

With regards to special education, interventions are planned strategies or actions designed to improve the academic, behavioural, and social performance of children and adolescents (Gilligan, 2005). As discussed above, areas of challenge for writers with ASD

across writing development involve transcription (handwriting fluency and spelling), productivity, and written text organization (Finnegan & Accardo, 2018). These difficulties in text organization, together with executive functioning deficits (Vivanti, 2015) that interfere with writing skills like planning, monitoring, and revising (Berninger & Amtmann, 2003), and deficits in theory of mind (Brown & Klein, 2011) can result to a written text that lacks central coherence and is perceived as poor. In this section, I will discuss the focus writing intervention research has taken for students with ASD and summarize the evidence-based instructional practices identified. Then, I will present the SRSD model of instruction, which is the theoretical framework of the writing intervention utilized in the present study.

Empirical research on writing interventions for students with ASD has focused on the following writing genres and skills: (a) persuasive writing; (b) story writing or story elements; (c) narrative writing; (d) expository/ informational writing (e) revision; (f) spelling or spell correcting; (g) sentence writing; (h) letter formation; (i) adjective use; and (j), action and describing words (Accardo et al., 2019; Pennington & Delano, 2012). Research has identified a number of effective practices that can be used by teachers and intervention professionals to support students with ASD in the area of writing: (a) the practices of the SRSD model of instruction (Accardo et al., 2019; Asaro-Saddler, 2016; Pennington & Delano, 2012); (b) constant time delay (Accardo et al., 2019); (c) response prompting and sentence frames (Accardo et al., 2019); (d) various forms of modelling (Accardo et al., 2019; Pennington & Delano, 2012); (e) sentence combining (Accardo et al., 2019); (f) reinforcement (Accardo et al., 2019; Pennington & Delano, 2012); (g) computer based instruction (Accardo et al., 2019; Pennington & Delano, 2012); and (h) task analytic instruction with systematic prompting and graphic organizers (Accardo et al., 2019; Pennington & Delano, 2012). Indeed, effective instruction in writing for individuals with ASD is complex and requires the combination of multiple strategies. The SRSD model of

instruction has the capacity to combine a variety of effective teaching strategies and tools (e.g., strategy instruction, modelling, graphic organisers, etc.) while targeting the writing skills that students with ASD struggle with, such as self-regulation, planning, revising, and text organisation. Thus, it is considered an effective instructional package to improve the writing skills of struggling writers with ASD (Accardo et al., 2019; Asaro-Saddler, 2016; Bazerman et al., 2017; Pennington & Delano, 2012). As SRSD will be the intervention framework utilized in the present study, in the following section I will present this framework and highlight gaps in the literature regarding SRSD writing interventions for individuals with ASD.

The SRSD Model of Instruction

Self-regulated strategy development (SRSD) is an approach to writing instruction developed by Karen Harris, Steve Graham, their research colleagues, numerous teachers, and their students, which has also been used in several other academic areas, such as reading and math (Harris et al., 2008; Harris et al., 2003). It is an evidence-based approach that helps students develop writing strategies and acquire knowledge about the writing process and content knowledge, self-regulation strategies such as goal setting and self-monitoring, positive attitudes and beliefs towards writing, and confidence in themselves as writers (Harris et al., 2008; Swanson et al., 2003).

There are six stages of instruction used to introduce and develop the writing and SRSD strategies in this approach. The first step is to develop background knowledge, where the teacher helps students develop pre-skills needed to understand, acquire, and execute the target strategy to allow students to move to the next stage (Harris et al., 2008). The next step is to discuss the strategy, where the teacher and the students examine and discuss prior and current performance, the writing strategies the students presently utilize, the benefits and goals of the proposed strategy instruction, as well as the mnemonic device used in the

strategy (Harris et al., 2008). The third step is called "model it", where the teacher models how the strategy is used, along with modelling helpful self-instructions, including problem definition, planning, strategy use, self-evaluation, coping and error correction, and self-reinforcement statements (Harris et al., 2008). The following step is to "memorize it", where students memorize the agreed-upon strategy steps, personalized self-statements, and any mnemonic if appropriate (Harris et al., 2008). The fifth phase is called "support it", and students practice using the strategy and self-instructions with teacher guidance until the learning objectives are met (Harris et al., 2008). Teacher and student evaluation of the strategy are ongoing and the teacher may again choose to use self-regulation procedures, including goal setting, self-assessment, or self-recording (Asaro-Saddler, 2016; Harris et al., 2008). Prompts and support are faded as appropriate. The final phase is called "independent performance", where students use the strategy and self-instructions independently (Harris et al., 2008).

To date, several studies support that SRSD interventions can improve the writing skills of a wide range of struggling writers. Apart from students with ASD, the SRSD model of writing instruction has been found to have a positive effect on the writing skills of students with emotional and behavioural disorders (e.g., Kiuhara et al., 2012; Mason & Shriner, 2008; Taft & Mason, 2011), attention deficit-hyperactivity disorder (e.g., Kiuhara et al., 2012; Taft & Mason, 2011), specific language impairment (e.g., Kiuhara et al., 2012), learning disability (e.g., Cook & Bennett, 2014; Harris et al., 2008; Kiuhara et al., 2012; Welch, 1992; Woods-Groves et al., 2014), intellectual disability (e.g., Taft & Mason, 2011; Woods-Groves et al., 2014), cerebral palsy (e.g., Woods-Groves et al., 2014), and chronic health impairments (e.g., Milford & Harrison, 2010). The age of these participants ranges from 7 to 22 years old (e.g., Cook & Bennett, 2014; Kiuhara et al., 2012; Mason & Shriner, 2008; Milford & Harrison, 2010; Taft & Mason, 2011; Welch, 1992; Woods-Groves et al., 2014)

Effectiveness of SRSD on ASD Students

There are several studies supporting SRSD's efficacy in improving the academic skills of students with ASD (e.g., Alresheed et al., 2018; Carr et al., 2014). With respect to writing, the SRSD model of instruction has been recognised as one of the most effective instructional models to assist struggling writers with ASD, especially when the elements of the intervention included graphic organisers, modelling, self-management techniques, reinforcement, explicit instruction with systematic prompting, and speech and print feedback (e.g., Accardo et al., 2019; Alresheed et al., 2018; Asaro-Saddler, 2016; Pennington & Delano, 2012). With respect to population, SRSD has been studied and found to be effective to assist struggling writers who have an ASD, Asperger's syndrome, or PDD-NOS diagnosis, with participant age ranging from six-year-old primary school students to 20-year-old college students (e.g., Asaro-Saddler, 2016; Jackson et al., 2018). However, the vast majority of the participants are male and in sixth grade or below, while there is limited research examining the effectiveness of SRSD on high-school and university students (Accardo et al., 2019; Asaro-Saddler, 2016). To date, most studies have investigated the effectiveness of SRSD interventions on story writing (e.g., Asaro-Saddler, 2014; Asaro-Saddler & Saddler, 2010; Asaro & Saddler, 2009; Mourgkasi & Mavropoulou, 2018), planning either as a separate skill or as one of the steps of the mnemonic used (e.g., Asaro-Saddler, 2014; Asaro-Saddler & Bak, 2012, 2014; Asaro-Saddler & Saddler, 2010; Asaro & Saddler, 2009; Mourgkasi & Mavropoulou, 2018), persuasive writing (e.g., Asaro-Saddler & Bak, 2012, 2014), opinion essay (e.g., Asaro-Saddler & Bak, 2014), revising, as well as action words and describing words (Accardo et al., 2019; Asaro-Saddler, 2016). The most widely used mnemonics have been the POW + TREE, the LEAF and the mnemonic WWW, What=2, How=2 (Asaro-Saddler, 2016). Research suggests the SRSD model of instruction as effective to increase the quality of persuasive or story writing, the quantity of a written passage, sentence combining

and adjective use, the student's planning time and behaviours, and their self-regulation behaviours (Accardo et al., 2019; Asaro-Saddler, 2016). Thus, it is apparent that the SRSD model of instruction supports the development of the high-level writing processes as detailed in the Simple View of Writing, and therefore assists writers with ASD move towards becoming skilled writers.

The PLEASE Strategy

The intervention that was developed for the present study is based on the SRSD model of instruction discussed above and the PLEASE strategy for paragraph writing. The PLEASE strategy was originally developed as a metacognitive, problem-solving strategy which addresses specific types of written expression deficits related to prewriting planning, composition, and paragraph revision (Welch, 1992). To date, there are two studies which have itemized the PLEASE strategy to assist struggling writers with different disabilities. Welch (1992) conducted research to investigate the effect of the PLEASE strategy on seven 6th grade students with learning disabilities who were struggling with writing. He examined (a) the student's metacognitive knowledge about prewriting planning, composition, revision, and paragraph parts, (b) the student's writing samples, and (c) the student's attitude toward writing paragraphs (Welch, 1992). The sessions were 30 minutes long, they were video-assisted, and they were implemented three times a week over a 20 week period in a resource room setting (Welch, 1992). The experimental and the comparison group's pre-test scores found the two groups comparable with respect to the metacognitive knowledge on the parts of a paragraph, their writing samples, and their attitudes towards paragraph writing (Welch, 1992). The intervention was found effective, since the post treatment mean scores of the experimental group were found significantly higher than the comparison group in all three areas (Welch, 1992).

The second study that used this strategy was conducted by Milford and Harrison (2010). They developed an intervention based on the PLEASE metacognitive strategy and the SRSD model of instruction to address the writing difficulties of an 11-year-old student with a chronic illness over six 60-minute sessions (Milford & Harrison, 2010). The results of this intervention indicated that SRSD was an effective intervention for a chronically ill middle school student with writing difficulties, since the student increased the quality and quantity of her written text, and was able to regulate her behaviour using the mnemonic and to apply the paragraph-writing procedures taught to her own writing (Milford & Harrison, 2010).

A review of the literature suggests that the effects of the PLEASE strategy on struggling writers with ASD have not been investigated. The SRSD model of instruction is an evidence-based practice which research suggests as an effective writing intervention for students with ASD (Accardo et al., 2019; Asaro-Saddler, 2016; Carr et al., 2014; Harris et al., 2003; Pennington & Delano, 2012). However, the literature reviewed in the previous sections suggests that further research is required on the effects of the SRSD model of instruction on students with ASD. More specifically, it has been suggested that research should (a) include more females in the sample; (b) investigate the effects on high-school and university students; (c) examine the effect of the intervention on the self-regulatory behaviours in a quantitative manner; (d) investigate a bigger variety of writing strategies that have proved effective for populations with other difficulties; (e) assess the effect of such interventions in a general education inclusive classroom; and (f) assess SRSD writing interventions directly administered by general education teachers (Accardo et al., 2019; Asaro-Saddler, 2016; Pennington & Delano, 2012; Spencer et al., 2014). The present study attempted to address some of the gaps in the research related to SRSD writing interventions for students with ASD.

Section Summary

Students with ASD often present writing difficulties with respect to production (length), spelling, fluency and structure. Their written compositions are often shorter in length with weak central coherence. Even if lower-level skills become automatized, their executive functioning deficits interfere with their self-regulatory skills during writing, which adds an extra obstacle in developing towards becoming skilled writers. SRSD writing interventions have proven to be effective on students with ASD as they address these higher-level writing skills while utilizing evidence-based effective practices for teaching students with ASD. However, there is a gap in the literature regarding the effectiveness of SRSD writing interventions on high-school students with ASD.

The Present Study

The present study examined the implementation of the PLEASE paragraph-writing intervention on high-school students with high-functioning ASD. This demographic is important, as more high-school students with ASD graduate from high-school and attend post-secondary education and in this transition, they require effective support in various social and academic areas, including writing (Elias & White, 2018; Jackson et al., 2018; White et al., 2017). This study aimed to extend previous research in three ways. First, it examined the effect of an SRSD writing intervention on high-school students with ASD, an age range that research focusing on ASD and SRSD has not adequately investigated (Accardo et al., 2019; Asaro-Saddler, 2016). Secondly, a review of the literature suggested that research has not yet investigated the effect of the PLEASE intervention on the paragraph writing skills of students with ASD. Therefore, the present study evaluated a strategy for use with adolescents with ASD that has been demonstrated to be effective in improving the writing skills of other populations (Milford & Harrison, 2010; Welch, 1992), as suggested by Pennington and Delano (2012). Thirdly, in addition to the writing outcomes, the present study attempted to add to previous literature by evaluating self-regulatory writing behaviours quantitatively to determine the extent to which changes in these behaviours may occur.

Method

The present study was designed to address the following research questions: (a) Is PLEASE an effective writing intervention for high-school students with high functioning ASD, as evidenced by a positive change in written expression scores? (b) Does PLEASE improve the self-regulatory writing skills of high-school students with high functioning ASD, as evidenced by an increase in observed self-regulatory behaviours when writing?

Design

The present study used a single case design (SCD) to investigate the research questions. SCD is a collection of experimental methods that are designed for use with one student or a small group of students (Riley-Tillman & Burns, 2009). Although it does not meet the demands to develop generalizable knowledge for a larger population, it allows an in-depth understanding of its population's target skill and response to intervention (Riley-Tillman & Burns, 2009). Through systematic replication of SCD studies, researchers can gradually gain confidence that the intervention will be effective in future applications if used on a similar population (Riley-Tillman & Burns, 2009). This design was selected because it presents certain advantages that meet the characteristics and needs of the present study. For example, the present research focused on high functioning students with ASD who attend high-school, a population that is not only unrepresentative of the norm (in clinical terms) of adolescent students, but also presents high variability of characteristics amongst individuals with the same diagnosis (American Psychiatric Association, 2000; Vivanti, 2015). SCD research has historically provided useful information for the special education field (Horner et al., 2005) as it provides an alternative to group designs (Alnahdi, 2015). This study was also implemented in a school. In an educational setting, it is not appropriate to have a control group of students who are intentionally denied an intervention, and it is also not ethical for the experimental group to stop attending the general education classes that may cause a

change to the target skill of the intervention (Riley-Tillman & Burns, 2009). Also, there is much higher variability amongst persons with disabilities, as already noted for people with ASD, which makes it challenging to assemble equivalent groups to compare and study (Alnahdi, 2015). Additionally, SCD is more feasible and can be adapted to meet the real-life needs of educational settings (Alnahdi, 2015; Horner et al., 2005) in order to investigate how students respond to an intervention (Riley-Tillman & Burns, 2009). SCD was used in the present study to compare the writing performances and self-regulatory behaviours of the participants before the intervention with the ones occurring during and after the intervention, which is the typical use of this research design (Alnahdi, 2015; Riley-Tillman & Burns, 2009).

SCDs present certain limitations regarding threats to their external and internal validity (Horner et al., 2005; Riley-Tillman & Burns, 2009). In the present study, certain steps were taken to enhance internal and external validity to the extent possible. To begin with, although the focus on the individual is an advantage of SCD in special education research, as it is a field that features a focus on individual intervention and practices, it can also be a weakness regarding external validity (Alnahdi, 2015). Regarding internal validity, the present study controlled for instrumentation changes (Riley-Tillman & Burns, 2009), as the interventionist followed the same procedures with all participants as described in the procedures section, and used the same materials, script and self-monitoring forms and correction rubrics with all students. Additionally, to minimize practice repeated testing effect (Riley-Tillman & Burns, 2009), alternate prompts (A-B) were used for the pre- and post-intervention assessment when available.

Participants

The targeted population for this intervention was high-school students with high-functioning ASD who are experiencing writing difficulties. Participants were referred from a

local independent school for children with learning disabilities (ie, ASD). Three students were referred for screening based on the following inclusion criteria: (a) they must have either a DSM-V diagnosis of high functioning ASD, or a DSM-IV diagnosis of PDD autistic disorder, Asperger's disorder, or PDD-NOS, which they received in Canada; (b); their IQ score is 85 or above. Exclusion criteria included (a) a diagnosis of intellectual disability (DSM-V) or mental retardation (DSM-IV-TR), and/or (b), an IQ score below 85. In addition, it was required that the students attended high-school classes and had identified and documented writing difficulties in their IEPs. One participant dropped participation after the screening assessment. The other two students proceeded. Student 1 was a 15 year old female with high-functioning ASD attending grade 10, following the general education curriculum with certain adaptations. Student 2 was a 17 year old male with high-functioning ASD in grade 12, also following the general education curriculum with certain adaptations. It was disclosed to the researcher that both students have received extracurricular support at home, behavioural interventions to address ASD symptoms, they use the school's counselling services, and they struggle with anxiety. Both students had an IEP which stated that their school teachers and parents found it crucial for them to receive extra support in developing their writing skills. Pseudonyms will be used to preserve confidentiality. Thus, student 1 will be referred to as "Erica" and student 2 as "John."

Section Summary

This study examined the implementation of the PLEASE paragraph-writing intervention on high-school students with high-functioning ASD. The PLEASE intervention's effect on students with ASD was investigated for the first time in this study and an attempt was made to measure self-regulatory writing skills quantitatively. The research questions were: (a) Is PLEASE an effective writing intervention for high-school students with high functioning ASD, as evidenced by a positive change in written expression

scores? (b) Does PLEASE improve the self-regulatory writing skills of high-school students with high functioning ASD, as evidenced by an increase in observed self-regulatory behaviours when writing? A single-case design (SCD) was used to compare the writing performances and self-regulatory behaviours of the participants before and after the intervention. SCD is widely used in special education as it allows an in-depth understanding of the target skill and response to intervention of a population that presents high variability of characteristics. Participants were a 15 year old female with high-functioning ASD attending grade 10 and student 2 was a 17 year old male with high-functioning ASD in grade 12. Both students attended a local special education school, had an IQ over 85, were following the general education curriculum with certain adaptations, and had documented writing difficulties in their IEPs. Their assigned pseudonyms are Erica and John respectively.

Procedures

Screening, pre-, and post-test assessment and all intervention sessions were delivered at the participants' school, in a quiet classroom provided by the principal.

Screening

To gain a better understanding of Erica and John's level in writing prior to intervention, the Sentence Composition and Essay Composition subtests of the Wechsler Individual Achievement Test (WIAT-III; Psychological Corporation, 2009) were used. WIAT-III is a comprehensive norm-referenced achievement test that provides information on academic achievement compared to Canadian children and adolescents of the same age. The Sentence Composition subtest measures sentence formulation skills including the use of correct grammar, syntax, semantics (meaning of words) and mechanics (punctuation, capitalization, and spelling; Psychological Corporation, 2009). The Sentence Composition subtest consists of (a) the Sentence Combining subtest, for which students are required to combine two or three target sentences in one complete sentence that includes all essential information and means the same thing; and (b) the Sentence Building subtest, for which students must write a complete sentence using the target word correctly and in appropriate context. The Essay Composition subtest measures written expression productivity (word count), theme development and text organisation (the use of introduction, conclusion, paragraphs, transitions, reasons why, and elaborations), as well as grammar and mechanics (Psychological Corporation, 2009). The examiner reads a prompt out loud while the student reads along, and then the student is given ten minutes to plan, write, and finalize their essay.

Both students were assessed on the same week. Erica scored below average on the Sentence Combining subtest (14^{th} percentile), and within average for Sentence Building (37^{th} percentile). On the Essay Composition subtest, both the word count (77^{th} percentile) and the theme development and text organisation (27^{th} percentile) scores were within average. John

scored within or above average on the WIAT-III subtests. More specifically, for the Sentence Composition subtest, he scored above average (88th percentile) on Sentence Combining and within average (34th percentile) on Sentence Building. For Essay Composition, he scored above average on word count (92nd percentile) and within average on the theme development and text organisation score (47th percentile). Despite John's WIAT-III performance falling within and above age-expectations, he was still included in the study because he met all inclusion criteria, his teachers identified him as a student who under-performs in writing and who would benefit from a writing intervention to meet his IEP goals, and because his high scores in WIAT-III could relate to the fact that he is familiar with norm-referenced academic achievement measures that entail similar writing demands.

Intervention Delivery

The PLEASE intervention involved three phases: (a) pre-testing and baseline assessment, (b) intervention delivery with on-going monitoring assessments, and (c) post-testing. The intervention delivery phase was originally designed to consist of eight 60-minute group lessons and include one lesson per week over eight consecutive weeks. Post-testing was planned to take place one week after the eighth session. Due to unexpected emergencies, lessons 6, 7, and 8 took place on the sixth week for John. For Erica, lessons 6 and 7 took place on the sixth week and lesson 8 on the 7th week. Lesson 8 was implemented one-on-one with each student. Post-testing was conducted seven weeks after the eighth and final session, and with each participant separately. The next section will describe in detail the assessment phases and the measures used.

Assessments and Measures

Pre-testing and baseline assessment took place one week prior to implementation. Students wrote two paragraphs each, one as a response to the WIAT-II Paragraph subtest and one as a response to PLEASE CBM. Post-test assessment took place seven weeks after the

completion of the intervention. The subsections that follow describe the assessment phases with a description of the measures used, the tasks and the scoring criteria.

Paragraph Writing Assessment

The Paragraph subtest of the Wechsler Individual Achievement Test - Second Edition (WIAT-II) was administered at pre- and post-test using alternative prompts to assess Erica and John's paragraph-writing performance before and after the intervention. WIAT-II is a comprehensive, norm-referenced measure, designed to assess the academic achievement of individuals aged four to 85 years old (Psychological Corporation., 2002). It is noteworthy that for pre- and post-test comparison, the WIAT-II was preferred over WIAT-III because (a) it tests paragraph writing while WIAT-III tests essay-writing, (b) it offers alternative prompts which helps control practice effect, and (c), it breaks down the component writing skills based on analytic scoring that is more consistent with the higher- and lower- lever skills involved in writing according to the Simple View of Writing. Norm-referenced scores could not be calculated because this subtest has been standardized on students attending grades 3-6. In this task, students were required to plan, write, and finalize a paragraph in 10 minutes. A prompt was read out loud that included the opening phrase of the paragraph. Students were required to finish the opening phrase on the answer sheet and continue with writing the rest of the paragraph. They were also told that they could a blank page as a draft to plan their writing.

The students' paragraphs at pre- and post-test were scored with the WIAT-II Paragraph Scoring Rubric of the examiner's manual (Psychological Corporation., 2002). Raw scores were recorded across the scoring rubric. The rubric was used to assess mechanics by evaluating if the paragraph includes at least seven words, counting the number of spelling and punctuation errors the students made in the paragraph, and looking for multiple spellings. Multiple spellings yields a score of one (1) when the students have multiple spellings for the

same word (either by spelling the same word once correctly and once incorrectly, or by using two alternative correct spellings), and zero (0) when they use consistent spelling (either correctly or incorrectly). Second, the rubric yielded an Organization Subtotal score (maximum score =10), which assessed sentence structure, number of sentences, use of linking expressions, use of examples to communicate ideas, and the unity and logical order of the paragraph (Psychological Corporation., 2002). Third, the Vocabulary score (maximum score = 5) evaluated the word variety and style of the paragraph. The sum of Vocabulary score, Organization score, and the multiple spellings score yielded the WIAT-II Total score (maximum score = 16).

PLEASE CBM

A PLEASE paragraph-writing curriculum-based measure (CBM) was developed by the researcher to assess Erica and John's response to the PLEASE intervention. It was designed to evaluate if and to what extent the students learned the writing and self-regulatory skills taught by the PLEASE strategy. In developing this measure, the researcher used prompts that were relevant to the topics covered by the students' curriculum. A single PLEASE CBM was administered at pre-test to obtain baseline data, one after lessons 3, 6, and 8, and one at post-test. The examiner read two prompts out loud while students were reading along. Then, students chose which prompt they prefer to write. They were given a blank piece of paper which wrote "draft" at the top of the page and were encouraged to use it to plan their writing. For CBMs administered after baseline, they were also encouraged to use the PLEASE strategy to plan and write their paragraph. The PLEASE CBM required each student to plan, write, and finalize their paragraph in ten minutes.

To score PLEASE CBM assessments, the PLEASE Scoring Rubric was developed. The rubric yields a PLEASE Writing and a PLEASE Planning score. The PLEASE Writing score (maximum score =9) evaluates the use of the writing skills that were explicitly taught

by the intervention: (a) structure and theme development, and specifically the use of topic sentence, number of supporting ideas, and conclusion; and (b), the use of transition words. The PLEASE Planning score (maximum score=10) evaluates the use of the writing self-regulatory skills taught by PLEASE to plan and write a paragraph. The score assesses the use of the following skills: (a) using a draft paper for planning; (b) writing down PLEASE; (c) the structure of the draft represents the structure of the paragraph; and (d), writing key-words on the draft as ideas that were incorporated on the answer sheet. The sum of PLEASE Writing and PLEASE Planning yields the PLEASE Total score, which captures the overall performance of the students in using the specific skills taught by the intervention (maximum score=19). Word count, number of spelling errors, and number of punctuation errors were also recorded as raw scores.

Inter-rater Reliability

All scores obtained and reported from all assessments come from the agreement of two raters. Specifically, the (a) WIAT-III Sentence Composition and Essay Composition Subtest for screening; (b) WIAT-II Paragraph subtest at pre-and post- testing; and (c), the PLEASE CBMs administered at baseline, lesson 3, 6, 8, and post-testing, were scored by the same two raters: (a) the researcher, who is a graduate student working towards a master of Educational Psychology with specialization in Special Education; and (b) a special education teacher who works with students with disabilities at a different high-school than the one the participants attend with advanced coursework in special education assessment. Initially, 17 scoring inconsistencies found in a total of 144 raw scores, giving an inter-rater reliability of 88%. All 17 scoring conflicts were resolved through discussion to reach 100% inter-rater agreement.

The PLEASE Intervention

The first lesson was devoted in activating and developing background knowledge and introducing the PLEASE strategy. All other lessons started with a brief test to see if the students remembered what PLEASE stands for, and then instructor and students had a brief discussion about what was taught in the previous lesson. Following the general guidelines on the stages of SRSD instruction, lessons two to eight covered the stages "Discuss it", "Model it", "Memorize it", "Support it", and "Independent performance" (Harris et al., 2008). At the end of all lessons, students and instructor did a wrap-up and briefly went over what they learned that day. In addition to the general procedures, the essence of each lesson is briefly discussed below.

Lesson 1

An overview of the purpose of the intervention and the qualities of a good paragraph was discussed. The researcher introduced the PLEASE strategy and presented the materials. The students orally stated the qualities that make a good paragraph, and identified these parts in the paragraph samples that were provided to them.

Lesson 2

The students looked for PLEASE parts in paragraphs that were be provided and graphed the existing parts on charting paper. The importance of transition words was introduced. The students were given the opportunity to discuss how they could make the given paragraphs better.

Lesson 3

The students looked for PLEASE parts in paragraphs they had written in the past and graphed the existing and missing parts. They also discussed how they could make their own paragraphs better. At the end and without the help of any materials, each student wrote a paragraph CBM.

Lesson 4

The researcher modelled how to use PLEASE for writing a paragraph and the use of self-statements. The students wrote their own personal self-statements.

Lessons 5 and 6

The students wrote two to three paragraphs in collaboration with the instructor, orally identified the PLEASE parts of the paragraphs and rated them using the graph. At the end of lesson 6, without the help of any materials, the students wrote a paragraph CBM.

Lesson 7

The focus of this lesson was to scaffold the students to gradually learn to plan before writing by creating their own graphic organisers. The instructor modelled how to draft their own organiser for writing a paragraph, and then proceed with writing the paragraph. Then, she supported the students in doing it themselves.

Lesson 8

The instructor gradually faded scaffolding the students in drafting their own organiser. By the end of this lesson, the students had to draft their own organisers and use it to write a paragraph that included all the elements that make a good paragraph. They had access to the PLEASE materials. At the end of lesson 8, without the help of any materials, the students wrote a paragraph CBM.

Fidelity of treatment implementation

To ensure fidelity of implementation, all lessons were scripted. The researcher followed each lesson's script with space provided to check-off each step. In addition, during wrap-up time, the researcher and the students went over each step completed to ensure the lesson was implemented as planned. A review of session notes showed that all procedures were followed as planned with three exceptions. There were two changes on the timeline of the intervention that need to be noted. As John was facing a family emergency and had to

leave the country for two months, it was decided to change the timeline to complete the intervention prior to his departure and do sessions 6, 7, and 8 on the same week. Unfortunately, Erica did not show for session 8 due to sickness. As John was leaving the country the next day, the last session was completed one-on-one, first with John on the scheduled day, and then with Erica three days later once she recovered. Thus, intervention lasted 6 weeks instead of 8 for John, and 7 weeks instead of 8 for Erica. Post-testing was not conducted a week after the intervention as planned, but as soon as John returned to the country, seven weeks after the eighth and final session.

Section Summary

The Sentence Composition and Essay Composition subtests of WIAT-III were used at screening to gain a better understanding of Erica and John's level in writing prior to intervention. Erica's scores were below and within average, and John's scores within and above average. The PLEASE intervention involved three phases: (a) pre-testing and baseline assessment, (b) intervention delivery consisting of eight 60-minute lessons with on-going monitoring assessments, and (c) post-testing. The Paragraph subtest of the WIAT-II was administered at pre- and post-test using alternative prompts to assess Erica and John's overall paragraph-writing performance. A PLEASE CBM was developed to assess Erica and John's response to the PLEASE intervention. It was designed to evaluate if and to what extent the students learned the PLEASE writing and PLEASE Planning skills taught. All scores obtained and reported from all assessments come from the agreement of two raters after reaching 100% inter-rater agreement. Following the general guidelines on the stages of SRSD instruction, lesson 1 introduced the strategy and lessons 2 to 8 covered the stages "Discuss it", "Model it", "Memorize it", "Support it", and "Independent performance." Fidelity of treatment implementation was addressed by using scripts and checklists.

Results

The present section will first describe the method used for data analysis which is called Percentage of Non-Overlapping Data (PND; Riley-Tillman & Burns, 2009). Then, results will be presented from the on-going monitoring and the pre- and post-testing assessments of the intervention.

Data Analysis

Data were analysed using the percentage of non-overlapping data points (PND) to examine intervention outcomes (Riley-Tillman & Burns, 2009). Also, traditional single case design procedures were used that include visual inspection to examine level, trend, and variability (Horner et al., 2005; Riley-Tillman & Burns, 2009). A non-overlap analysis was selected because it was deemed appropriate based on the research questions and the design of the present study. More specifically, non-overlapping analysis was used to investigate if a change occurred (i.e., change in writing scores) between two phases (i.e., before and after the implementation of PLEASE intervention) based on the data collected for two participants (John and Erica) in the same setting (school classroom). In addition, non-overlap analysis methods have social validity within a special education context, because (a) they are directly interpretable and (b) they allow teachers working directly with a student and their family to make informed decisions (Parker, Vannest, & Davis, 2014). PND was specifically selected because it was the first and to date, most popular and widely used method to quantitatively synthesize SCD data (Parker et al., 2014; Wolery, Busick, Reichow, & Barton, 2008). In PND analysis, an intervention can be anywhere from zero to 100% effective (Scruggs & Mastropieri, 2001). To calculate the PND, the data collected between two phases are compared. For example, if at baseline a student obtained the scores 2, 3, and 4 (which are the data points for phase A), and at on-going monitoring and post-testing the student obtained the scores 4, 5, and 10 (which are the data points for phase B), PND would be calculated as

follows: First, the highest data point in phase A must be identified, which is 4. Then the researcher looks at phase B to see how many data points are higher than that. In this example, two out of three data points (5 and 10) in phase B are higher than the highest data point of phase A. Dividing 2/3 equals 0.6, which multiplied with 100 gives a PND score of 60%. To calculate the effect size, the interpretation guidelines proposed by Scruggs and Mastropieri (2001) were used in this study. They recommend that PND scores above 90% indicate "very effective treatments", scores from 70% to 90% "effective treatments", scores from 50% to 70% suggest "questionable" treatment, and scores below 50% "ineffective" treatments (Scruggs & Mastropieri, 2001, p. 230). Thus, in the example presented above, the effect of the intervention would be questionable.

Response to Intervention: On-going monitoring

This section will present Erica and John's performance on the PLEASE CBMs and assess the effect of this intervention on the specific paragraph-writing and planning skills taught by PLEASE. PNDs were calculated for each student to assess if and to what extent the PLEASE intervention was effective in improving the students' paragraph writing and self-regulatory skills. To make scores comparable and figures easier to read, all scores were converted to have a maximum score of 10 when calculating and graphing PNDs.

Erica

Table 1 summarizes Erica's scores on the PLEASE CBMs administered at baseline and throughout the intervention:

Table 1

Erica's PLEASE CBM Raw Scores

Phase:	Baseline	Lesson 3	Lesson 6	Lesson 8	Post- test
Spelling Errors	2	2	3	0	4
Punctuation Errors	0	1	1	0	0

Word Count	111	110	117	118	104
PLEASE Writing (max. 9)	5	9	9	9	9
PLEASE Planning (max. 10)	0	5	8	10	10
PLEASE Total Score (max. 19)	5	14	17	19	19

Figure 3 presents Erica's PLEASE Writing scores on the PLEASE CBM at baseline and throughout the intervention. At baseline (phase A), Erica scored 5.5/10. Throughout the intervention and at post-test (phase B), Erica scored 10/10. Four out of four scores at phase B were higher than the highest score on phase A (4/4=1). The PND for this measure was 100%, which means that the PLEASE intervention was very effective in improving Erica's writing performance, as evidenced by a positive change in her written expression scores on the PLEASE CBM (Parker et al., 2014; Scruggs & Mastropieri, 2001).

Figure 3

Erica's PLEASE Writing scores on PLEASE CBMs

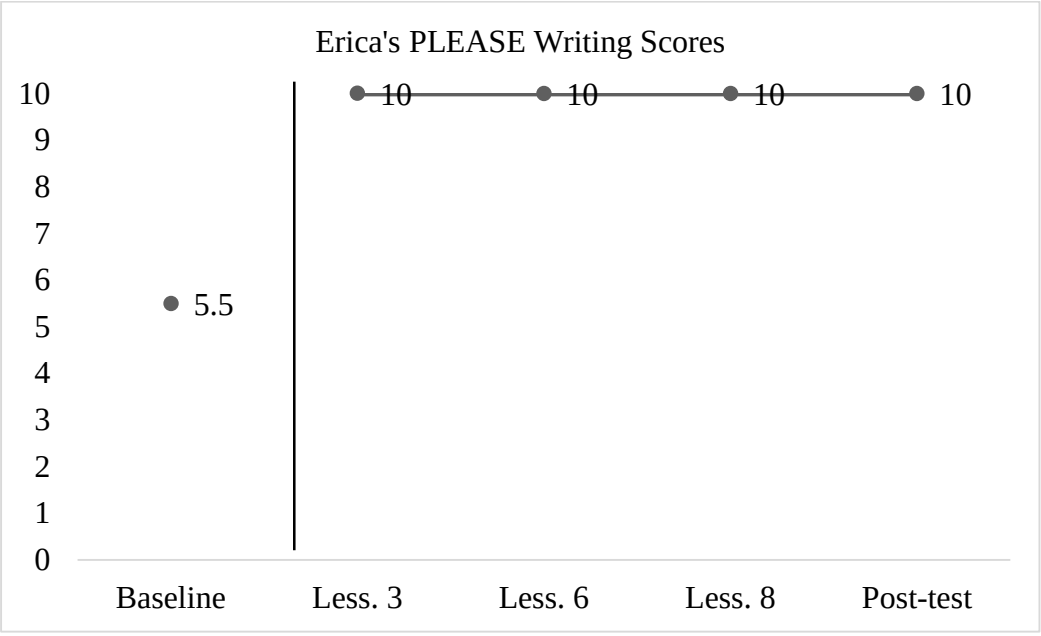
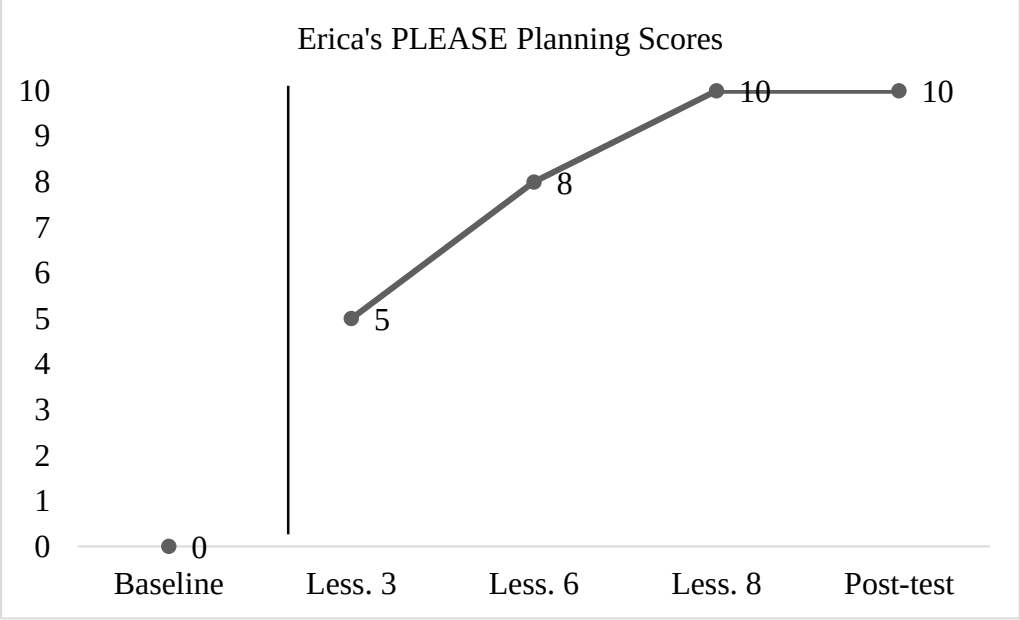


Figure 4 presents Erica's PLEASE Planning scores on the PLEASE CBM at baseline and throughout the intervention. At baseline (phase A), Erica scored 0/10, as she did not demonstrate any self-regulatory writing skills. Throughout the intervention and at post-test (phase B), Erica's self-regulatory writing behaviours increased and thus, her planning scores gradually increased. Four out of four scores at phase B were higher than the score on phase A (4/4=1). The PND for this measure was 100%, which means that the PLEASE intervention was very effective in improving Erica's self-regulatory writing skills, as evidenced by a positive change in her planning scores on the PLEASE CBM (Parker et al., 2014; Scruggs & Mastropieri, 2001).

Figure 4

Erica's PLEASE Planning scores on PLEASE CBMs



The pattern of increase in Erica's scores on the CBM measure throughout the intervention aligns with the order skills were taught in each lesson. Between baseline and lesson 3, students were explicitly taught which qualities make a good paragraph (topic sentence, supporting ideas, conclusion, and transition words). The use of these skills was evaluated by the PLEASE Writing score. The concept of PLEASE planning was also introduced, but not

explicitly taught. Erica's PLEASE Writing scores increased from 5.5 at pre-test, to 10/10 after lesson 3. She also started planning her paragraph, and her score increased from 0/10 to 5/10. Between lessons four and six, instruction focused on how to first plan, and then write a paragraph, using the PLEASE graphic organizer. This instruction had an immediate effect on Erica's planning skills, as her planning score further increased from 5/10 (lesson 3) to 8/10 (lesson 6). Also, she maintained a 10/10 score for PLEASE Writing. Finally, lessons seven and eight explicitly taught how students plan their paragraphs by making their own draft, and monitoring that they have completed all the PLEASE steps on that draft. This instructional focus further increased Erica's PLEASE Planning scores to a 10/10, and PLEASE Writing consistently remained at 10/10.

John

Table 2 summarizes John's Please scores obtained during the PLEASE CBM assessments at baseline and throughout the intervention.

Table 2

John's PLEASE CBM Raw Scores

Phase:	Baseline	Lesson 3	Lesson 6	Lesson 8	Post- test
Spelling Errors	0	1	0	1	4
Punctuation Errors	2	0	1	0	1
Word Count	112	125	150	157	117
PLEASE Writing (max. 9)	5	9	9	9	9
PLEASE Planning (max. 10)	0	0	0	10	10
PLEASE Total Score (max. 19)	5	9	9	19	19

Figure 5 presents John's PLEASE Writing scores on the PLEASE CBM at baseline and throughout the intervention. At baseline (phase A), John scored 5.5/10. Throughout the intervention and at post-test (phase B), he scored 10/10. Four out of four scores at phase B

were higher than the highest score on phase A (4/4=1). The PND for this measure was 100%, which suggests that the PLEASE intervention was very effective in improving John's writing performance, as evidenced by a positive change in his written expression scores on the PLEASE CBM (Parker et al., 2014; Scruggs & Mastropieri, 2001).

Figure 5

John's PLEASE Writing scores on PLEASE CBMs

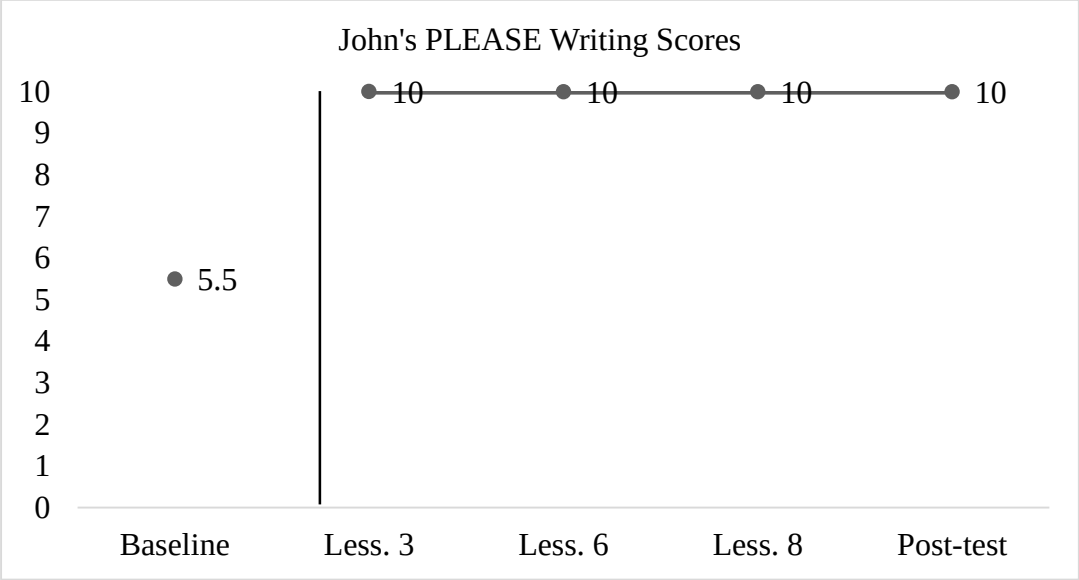
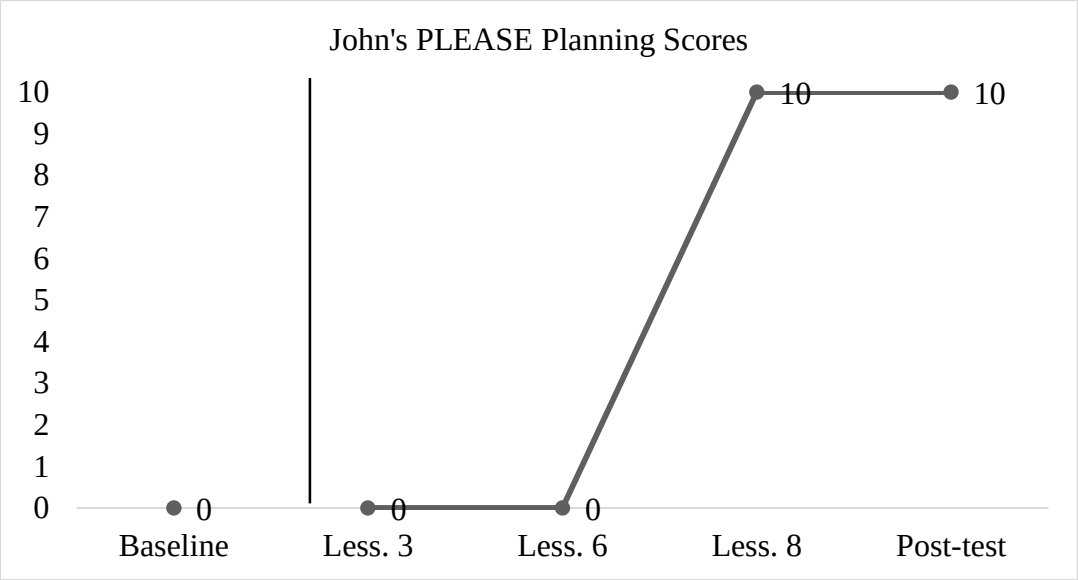


Figure 6 presents John's PLEASE Planning scores on the PLEASE CBM at baseline and throughout the intervention. At baseline (phase A), John scored 0/10, as he did not demonstrate any self-regulatory writing skills. Throughout the intervention and at post-test (phase B), John's planning scores improved slowly but not gradually: they initially remained zero, and then rapidly increased to 10/10. Two out of four scores at phase B were higher than the score on phase A (2/4=0.5). The PND for this measure was 50%, suggesting that the PLEASE intervention's effect was questionable in improving John's self-regulatory writing skills (Parker et al., 2014; Scruggs & Mastropieri, 2001). However, looking at John's planning score on the CBM at baseline, and comparing it only with his scores after the completion of the intervention (lessons 8 and post-test) one can see a rapid improvement, as

his planning scores between these phases increased from 0/10 at baseline, to 10/10 both at lesson 8 and post-test, and do not overlap. This suggests a very effective intervention (2/2=1, PND=100%). This contradiction will be addressed further in the following sections.

Figure 6

John's PLEASE Planning scores on PLEASE CBMs



As shown in Figures 5 and 6, John's scores also increased throughout the intervention. The way his scores increased aligns with the order these skills were taught per lesson. As lessons one to three focused on the qualities that make a good paragraph (evaluated by the score PLEASE Writing), John's PLEASE Writing score immediately increased from 5.5 to 10: his paragraph included all parts that make a good paragraph and transition words to help the reader follow his thoughts and arguments. The concept of PLEASE planning was introduced in the first lessons but John did not attempt to plan his paragraph at that point of the intervention. Lessons 4 to 6 focused on teaching students how to first plan, and then write a paragraph using the PLEASE graphic organizer for guidance, and John successfully used it to plan and write practice paragraphs during the lessons. However, when completing the CBM assessment on lesson 6 without the help of the graphic organizer, John did not transfer any of

the PLEASE Planning skills on the blank draft paper, and his score remained 0/10. He did maintain the PLEASE Writing skills (10/10 score). Lessons 7 and 8 specifically targeted the skill of planning a paragraph by creating a draft on a blank paper, and monitoring the PLEASE steps on that draft. Thus, the skill of how to create a well-written draft without the support of materials was modelled and students were scaffolded until they could do it independently. This instructional focus rapidly increased John's PLEASE Planning scores from 0 to a 10/10, which he maintained at post-test.

Pre- and Post-testing: Paragraph Writing

This section will present and discuss Erica and John's overall writing performance at pre- and post-test on the Paragraph subtest of WIAT-II.

Erica

Table 3 summarizes Erica's writing scores obtained using the WIAT-II Paragraph subtest during the Paragraph Writing assessment at pre- and post-test.

Table 3

Erica's Paragraph Writing Raw Scores

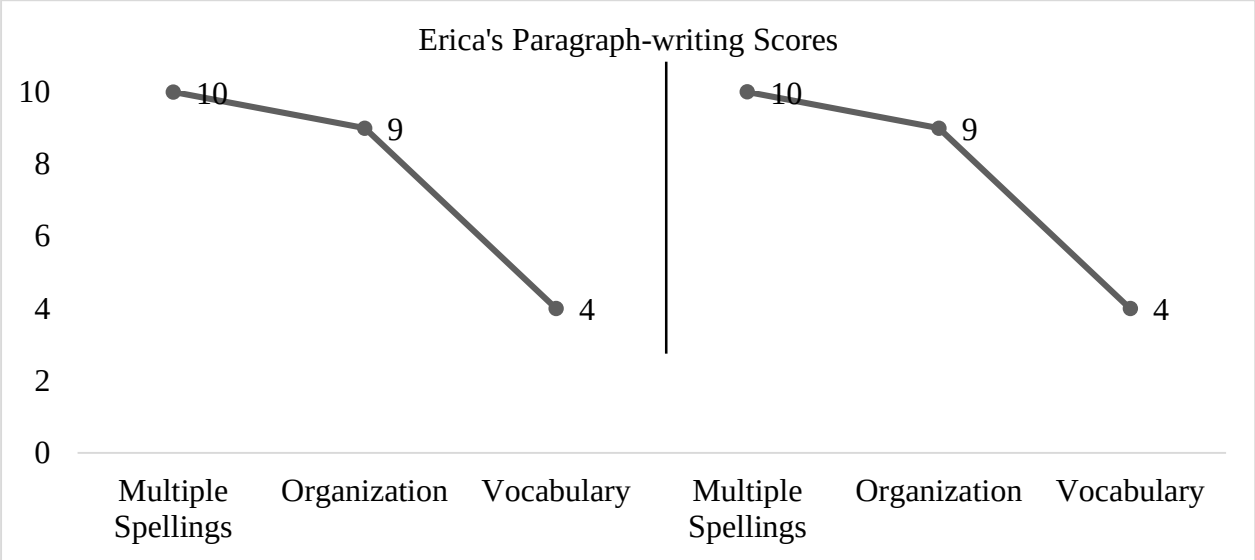
Phase:	Pre-test	Post- test
Mechanics - Spelling Errors	2	3
Mechanics - Punctuation Errors	1	0
Mechanics - Multiple Spellings	1	1
Organization Subtotal (max. 10)	9	9
Vocabulary Subtotal (maximum 5)	2	2
WIAT-II Total Score (max. 16)	12	12
Word Count	171	110

Figure 7 depicts Erica's writing performance at pre- and post-test on the Paragraph subtest of WIAT-II (Psychological Corporation., 2002). As shown in Table 3 above, Erica's post-test overall writing quality as assessed by the Paragraph writing subtest of the WIAT-II was

negligible. It needs to be noted that the majority of Erica's scores on this measure were already excellent before the implementation of the intervention, with 10/10 for multiple spellings and 9/10 for organization and thus, there was small room for improvement.

Figure 7

Erica's Paragraph-writing scores



John

Table 4 summarizes John's writing scores obtained using the WIAT-II Paragraph subtest during the Paragraph Writing assessment at pre- and post-test.

Table 4

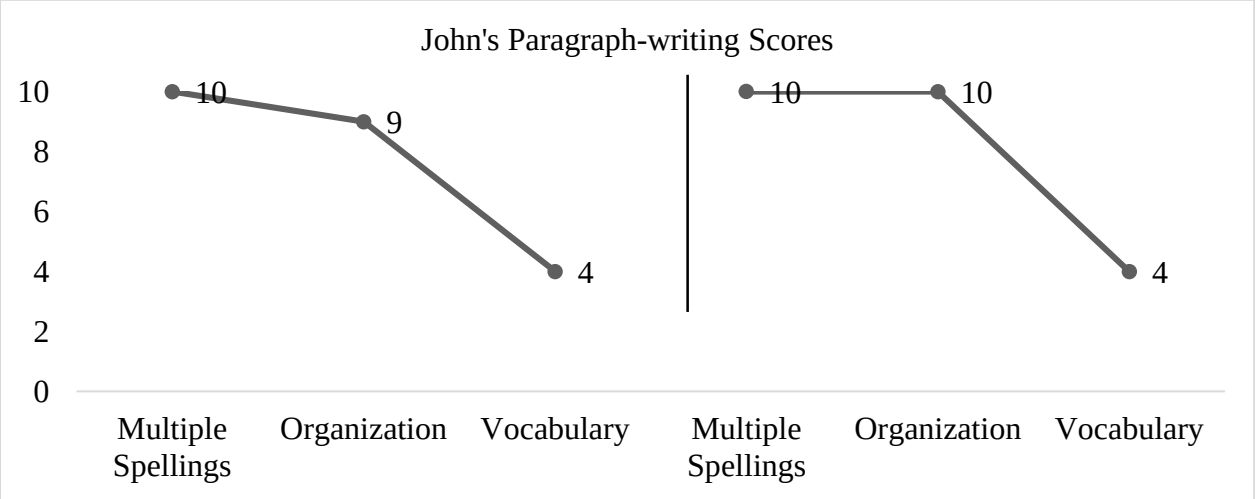
John's Paragraph Writing Raw Scores

Phase:	Pre-test	Post- test
Mechanics - Spelling Errors	2	0
Mechanics - Punctuation Errors	0	1
Mechanics - Multiple Spellings	1	1
Organization Subtotal (max. 10)	9	10
Vocabulary Subtotal (maximum 5)	2	2
WIAT-II Total Score (max. 16)	12	13
Word Count	118	131

Figure 8 presents John's writing performance at pre- and post-test on the Paragraph subtest of WIAT-II (Psychological Corporation., 2002), suggesting negligible effects on overall writing quality (Parker et al., 2014; Scruggs & Mastropieri, 2001).

Figure 8

John's Paragraph-writing scores



Overall, the results of the ongoing-monitoring assessments indicated that the PLEASE intervention was very effective in improving Erica and John's paragraph writing and planning skills. PNDs suggest PLEASE was very effective in teaching students how to write a good paragraph. With respect to self-regulatory writing skills, the intervention was very effective in improving Erica's planning skills. Although John's planning scores also increased from zero to excellent, the PND suggested that PLEASE had a questionable effect on his self-regulatory writing skills. Both students responded positively to the intervention as their PLEASE scores gradually improved and the variability of the scores decreased. The scores from Erica and John's writing performance at pre- and post-test on the Paragraph subtest of WIAT-II suggests that the intervention did not have an effect on the students' overall writing skills. However, the majority of Erica's and John's scores on this measure were already

excellent before the implementation of the intervention. Thus, there was not much room for improvement on that measure. Interestingly, John did not use his PLEASE Planning skills when writing the Paragraph subtest of WIAT-II at post-testing, while Erica did, and the word counts for both students were different between pre- and post-test with Erica decreasing and John increasing the word count score.

Section Summary

Overall, the results of the ongoing-monitoring assessments indicated that the PLEASE intervention was very effective in improving Erica and John's paragraph writing and planning skills, with John mastering the PLEASE Planning skill only after the completion of the intervention. Erica and John's scores at pre- and post-test suggests that (due to ceiling effects at pre-test) the intervention did not lead to substantial improvements in the quality of students' overall writing performance.

Discussion

The present study investigated the implementation of the PLEASE paragraph-writing intervention and its effect on high-school students with high-functioning ASD. It was designed to address the following research questions: (a) Is PLEASE an effective writing intervention for high-school students with high functioning ASD, as evidenced by a positive change in written expression scores? (b) Does PLEASE improve the self-regulatory writing skills of high-school students with high functioning ASD, as evidenced by an increase in observed self-regulatory behaviours when writing?

Response to Intervention

On-going Monitoring: Writing and Planning

Writing. Results from data analysis as well as observations recorded throughout the intervention suggest that the PLEASE intervention was very effective in improving Erica and John's paragraph-writing skills with respect to structure, theme development and organization skills (topic sentence, supporting ideas, conclusion, and use of transition words). Before the intervention, Erica's paragraph did not include all paragraph parts as she did not write a concluding sentence. Both scorers observed that although she wrote two supporting ideas, these ideas were not relevant to her topic sentence and were not linked to each other. Finally, she included two transition words. After the PLEASE strategy was introduced, her score almost doubled, as she included all parts that make a good paragraph (a topic sentence, three supporting ideas, a concluding sentence) and used four transition words. It is noteworthy that the supporting ideas used were directly related to and efficiently supported the topic sentence. They were also presented in a logical order that supported her conclusion. John also improved the theme development and organization of his paragraph. Although at baseline he technically included all paragraph parts (topic sentence, three supporting ideas, and conclusion), his arguments were not linked to each other and his articulation did not

flow. He also did not elaborate on each point he raised. Although he included a concluding sentence, it was a brief re-statement of the topic of the paragraph rather than a summary of his arguments. After the PLEASE strategy was introduced, his score also increased as he included four transition words. At post-test, the quality of his paragraph had improved, as his supporting ideas were linked to each other, supported the topic sentence, and followed in a logical order. John also included extra sentences to elaborate on every point he raised as a supporting idea. The quality of his conclusion also improved with him re-stating the main arguments of the paragraph.

These findings are consistent with the findings of previous research on the effects of SRSD writing interventions to improved writing performance of students with ASD. Several studies have found that SRSD writing interventions have increased the number of functional writing elements (the thematic and organizational parts required for a good story, essay, paragraph, etc.) of students with ASD (e.g., Asaro-Saddler, 2014, 2016; Asaro-Saddler & Bak, 2014; Asaro-Saddler & Saddler, 2010; Asaro & Saddler, 2009; Delano, 2007a). Erica and John's improvement in the quality of the paragraph parts is also consistent with existing literature. Several studies have found that SRSD writing interventions improve the overall (holistic) quality of the written products of students with ASD (Asaro-Saddler, 2014, 2016; Asaro-Saddler & Bak, 2012, 2014; Asaro-Saddler & Saddler, 2010; Asaro & Saddler, 2009; Delano, 2007b).

Planning. With respect to planning, both Erica and John improved their planning scores. By the end of the intervention, not only did Erica and John engage in overt planning, but they were able to write a well-organized draft: they utilized the PLEASE acronym to monitor their planning completing all PLEASE steps and they used key-words to draft the main topic, topic sentence, and supporting details. They used the draft's key-words in their final answer while making additions and final edits. Using key-words instead of full

sentences on the graphic organizer or draft paper was initially challenging for both students. However, with practice and scaffolding via the SRSD instructional approach, Erica and John were able to independently write drafts that use key-words rather than complete sentences. The PND calculated for Erica's progress (100%) suggests a very effective intervention. For John, the PND was 50%, which suggests a more modest effect in improving John's self-regulatory writing skills throughout the intervention. However, comparing only his baseline planning scores with scores after the completion of the intervention (obtained at lesson 8 and post-test), the PND is 100%. This finding suggests that PLEASE was an effective treatment for John, but it took him longer than Erica to demonstrate this skill during testing. John's response can be explained by the stage of the intervention at each CBM assessment. John successfully used PLEASE to plan by filling in the graphic organizer during in-lesson practice. However, he did not transfer this skill to a different writing context, a test with no access to materials, until lessons 7 and 8 where completed. During these two lessons, students were explicitly taught how to plan using PLEASE without the help of any materials on a blank paper. There is a speculation on why Erica acquired this skill faster than John. Prior to the implementation of the intervention (at screening, pre-test and baseline), the researcher observed that Erica allocated a minute to check her answers for mistakes before handing them in. Throughout and after the intervention, if she had time left, she would do a final check before submitting her answer. Although this was not a skill taught by PLEASE, it is note-worthy because it was a demonstration of a self-regulatory revising skill. This could have made Erica more adaptable to pick up other self-regulatory writing skills, such as PLEASE Planning.

These findings align with previous studies which demonstrated that students with ASD have improved their pre-writing planning skills after the implementation of an SRSD writing intervention (e.g., Asaro-Saddler & Bak, 2014; Asaro-Saddler & Saddler, 2010;

Mourgkasi & Mavropoulou, 2018). A difficulty in using key-words rather than full sentences has been noted by previous studies examining SRSD writing interventions with this population (e.g., Asaro-Saddler & Bak, 2014). An interesting observation was Erica and John's attitude towards the use of self-statements. Some studies found that students with ASD found self-statements useful and encouraging, and they effectively used them to self-regulate while writing (e.g., Asaro-Saddler & Bak, 2014; Asaro-Saddler & Saddler, 2010). That was not the case for Erica and John. They would use self-statements when prompted, but they seemed reluctant to use them during in-lesson independent practice and during testing, which is also consistent with findings from other studies (e.g., Asaro-Saddler, 2014). When Erica and John were asked, they said that they found self-statements more "general" and "not very practical", and preferred to use each letter of PLEASE as a step or goal to ensure they are writing a good paragraph.

Overall Findings. Overall, the results indicated that utilizing the PLEASE strategy using a SRSD approach was a very effective intervention to improve Erica and John's paragraph-writing skills. In addition, it had a positive effect on their self-regulatory writing skills, as participants engaged in overt planning at post-test, which they did not do prior to intervention, and presented well-organized planning drafts. These findings align with previous research that used SRSD interventions to support students with ASD in improving their writing (e.g.,Asaro-Saddler, 2016; Asaro-Saddler & Bak, 2014; Asaro-Saddler & Saddler, 2010; Asaro & Saddler, 2009; Delano, 2007a, 2007b; Schneider et al., 2013) and planning skills (e.g., Asaro-Saddler, 2016; Asaro-Saddler & Bak, 2014; Asaro-Saddler & Saddler, 2010). In addition, these findings are consistent with the Simple View of Writing (Berninger & Amtmann, 2003) and Hayes' theories of writing (Hayes, 1996, 2012; MacArthur & Graham, 2006). The first two stages of the SRSD model of instruction allow students to develop background knowledge on the topic (e.g., the parts that make a good

paragraph, techniques to improve writing outcomes such as planning) and discuss the benefits of using the specific SRSD strategy (e.g., PLEASE to plan and write; Harris et al., 2008). These steps first activate the students' long term memory, which includes knowledge of writing forms and qualities (Berninger & Amtmann, 2003), and then enrich their knowledge on the topic of paragraph-writing. In addition, the rest of the SRSD steps help students acquire a self-regulatory strategy (PLEASE), which assists the student's planning, reviewing, and revising skills with respect to paragraph writing. These skills are all essential sub-processes of the students' executive functioning system (Berninger & Amtmann, 2003). Thus, as this intervention strengthened Erica and John's long-term memory and executive functions for paragraph-writing, an improvement in the students' paragraph writing scores (text generation) was expected. Furthermore, planning is an important skill involved in the process of writing as the central writing theories attest (e.g., The Simple View of Writing, Flower and Hayes' 1980 model, Hayes' 1996 model). Torrance (2006) added to this theory arguing that creating a draft is a discrete stage in the production of a written document and it requires the use of all the cognitive skills involved in the writing process. The result of pre-writing planning is a written product (draft) that is different from but connected to the final written output (Torrance, 2006). Thus, writers use their executive functioning, long-term memory, working memory, and transcription skills to generate a draft. The PLEASE strategy supported the coordination of these processes, as the "PLE" steps of PLEASE were used by Erica and John as a self-regulatory tool to regulate their draft-writing, and then the "ASE" steps guided Erica and John in writing the final product, a paragraph, using their draft as a point of reference.

Pre- and Post-test

The WIAT-II Paragraph subtest was a measure of general writing quality. Erica and John's performance on it suggests that the intervention did not have an effect on their overall

writing quality. Thus, although the student's PLEASE CBM scores suggest a very effective treatment for the targeted planning and writing (theme development and organization) skills, the improvement of these skills did not translate in differences in overall writing quality as captured in changes to post-test scores on the quality of WIAT-II paragraphs. As already noted, both students' overall writing scores were excellent before the implementation of the intervention, suggesting ceiling effects at pre-test. Thus, there was not much room for improvement on that measure. Ceiling effects have been noted before as a challenge in studies utilizing SRSD interventions with older students with ASD (Carr et al., 2014). The WIAT-II Paragraph measure was not suitable for the ages of the students, but it was chosen because it targeted paragraph-writing skills. Older students' writing skills on the WIAT-II are evaluated by constructing an essay (with multiple paragraphs), but the Paragraph subtest was preferred as it matched more closely the PLEASE intervention task and offered alternative prompts for pre- and post-testing.

Overall Findings

Overall, findings suggest that PLEASE was an effective intervention to improve Erica and John's paragraph-writing and self-regulatory planning skills. The first research question investigated whether PLEASE is an effective writing intervention for high-school students with high functioning ASD, as evidenced by a positive change in written expression scores. Results suggested that PLEASE was a very effective intervention for Erica and John regarding the writing skills targeted (theme development and organization). In addition, scorers observed that the quality of the students' writing improved because the students' supporting ideas became clearer and more complete with the use of elaborations and effectively supported the topic sentence and the conclusion. The second research question examined if PLEASE improves the self-regulatory writing skills of high-school students with high functioning ASD, as evidenced by an increase in observed self-regulatory behaviours

when writing. Results suggest that the intervention was effective in improving the students' self-regulatory writing skills. Before the intervention, neither of the students planned their writing nor used a draft to regulate the writing process. After the completion of the intervention, both students engaged in overt planning, created a well-organized draft, and used it as a point of reference to develop a well-organized paragraph.

These findings are consistent with previous studies which also found other SRSD writing interventions having a positive effect on the writing and planning skills of students with ASD (Asaro-Saddler, 2014, 2016; Asaro-Saddler & Bak, 2012, 2014; Asaro-Saddler & Saddler, 2010; Asaro & Saddler, 2009; Delano, 2007b; Mourgkasi & Mavropoulou, 2018), and with studies that found PLEASE to be effective in teaching students with different diagnoses paragraph-writing (e.g., Milford & Harrison, 2010; Welch, 1992). Also, these findings support the literature that highlights the SRSD method of instruction as an intervention valuable to inclusive instructional contexts. With respect to writing, SRSD aligns with the most influential theoretical models explaining the writing process and it can be used to strengthen the students' executive functions involved in writing. As students with ASD often present difficulties with self-regulation and executive functioning, both of which are hypothesized as important factors affecting their writing (Brown & Klein, 2011; Vivanti, 2015), the SRSD approach and the PLEASE strategy can prove invaluable tools for educators in the inclusive classroom.

Strengths and Limitations

To the author's knowledge, this was the first study to investigate the effect of PLEASE on high-school students with ASD, as previous research focused on teaching this strategy to different populations and age groups (e.g. Milford & Harrison, 2010; Welch, 1992). Also, no other study was identified that uses an SRSD approach to teach paragraph writing to students with high-functioning ASD. So far, studies targeting this population have

focused on using SRSD interventions to teach story and essay-writing (Asaro-Saddler, 2016). In addition, previous research that investigated SRSD writing interventions to improve the planning skills of students with ASD did not evaluate the quality of students' draft writing quantitatively. Most studies reported anecdotal evidence of improved planning skills (e.g., Asaro-Saddler, 2014; Asaro-Saddler & Bak, 2012; Asaro & Saddler, 2009) or counted the time spent planning or the transformation of content from draft to final written product (e.g., Asaro-Saddler & Bak, 2014; Asaro-Saddler & Saddler, 2010). As creating a draft is a discrete stage in the production of a written document and requires the use of all the cognitive skills involved in the writing process (Hayes, 2012; Torrance, 2006), the present study used the SRSD method to explicitly teach draft-writing and evaluated quantitatively the quality of Erica and John's drafts as written products. It also evaluated quantitatively whether its contents were connected to and used in the final output, which was the students' final paragraphs on the answer sheet. Future studies could further investigate pre-writing planning with respect to key-word use and note-taking, elements of a good draft for different types of texts (e.g. paragraph, essay, letter, story), and assessing the quality of students' planning by evaluating drafts as a written product.

This study also presents certain limitations. To begin with measures, the pre- and post-test assessment with the Paragraph subtest of the WIAT-II evaluated raw scores. A measure permitting calculation of standard scores and comparison with norms at pre- and post-testing would have assessed changes in Erica and John's overall writing quality more validly and reliably. Another identified challenge was ceiling effects at pre-test on this measure.

As far as the PLEASE CBM is concerned, scorers observed that there were changes in Erica and John's writing that were not captured by the CBM and had to be reported as anecdotal evidence. Although the CBM assessed the use or not of the parts that make a good

paragraph, it did not capture changes in: (a) the quality of these parts; (b) whether supporting ideas were relevant to and effectively supporting the students' thesis as stated in the topic sentence; (c) how clearly each idea was communicated; and (d), the number of run-on and fragment sentences, which was identified as a contributing factor that influenced how well-articulated the students' ideas were perceived by the scorers. Future studies could use measures that will capture such changes in the quality of the paragraph parts included.

With respect to the study's design, SCDs present external validity limitations as they do not meet the criteria to develop generalizable knowledge for a larger population (Horner et al., 2005). Also, although three students were initially referred for the intervention, one student dropped participation resulting in a sample consisting of two students. The number of participants was small and thus, this study alone provides limited information on the effectiveness of the intervention. However, a small sample size is consistent with prior research in this area and with SCD (Alnahdi, 2015; Parker et al., 2014; Riley-Tillman & Burns, 2009) and several meta-analyses have provided overwhelming evidence on the efficacy of SRSD across special education populations with writing difficulties (e.g. Carr et al., 2014; Olde Dubbelink & Geurts, 2017; Rogers & Graham, 2008). Running concurrent cases and comparing across groups, as well as conducting randomized control studies would be helpful to gain a better understanding on the generalizability of the effectiveness of PLEASE for this population. This study tried to control for internal validity by using scripts for all lessons and assessments and by following the same procedures for all participants, in the end there were some changes in the way the intervention was implemented: unexpected events resulted in changes in the timeline of the last two session and post-testing.

Implications to Practice

The findings of this study provide useful implications for teachers and other professionals working with adolescents with ASD to improve their writing. First, both

students reported that the PLEASE mnemonic device used to teach the steps of paragraph-writing was the most useful part of the strategy. They used it to set goals and regulate their writing. This aligns with findings from previous research that also found the acronym being the most important part of SRSD strategies (Asaro-Saddler, 2016; Asaro-Saddler & Saddler, 2010; Carr et al., 2014). Furthermore, John's initial difficulty to transfer the PLEASE planning skills from the graphic organizer to a blank draft at a different context (testing), and the fact that he overcame this difficulty once the interventionist modelled this skill and scaffolded him in doing so independently, suggests that teachers should consider (a) using various supportive materials to introduce a skill and then gradually fade support, (b) to first explicitly teach and model how a skill is used when supportive materials are not available, before they ask students to demonstrate the skill independently, and (c) scaffold students in this process until they can successfully perform the task without supportive materials independently. The benefits of the SRSD model of instruction and the use of graphic organizers, explicit instruction, modelling, and scaffolding with this population, have been highlighted by studies examining academic interventions for students with ASD (e.g. Accardo, Finnegan, Kuder, & Bomgardner, 2019; Alresheed, Machalicek, Sanford, & Bano, 2018; Asaro-Saddler, 2016; Harris et al., 2008; Pennington & Delano, 2012).

Conclusion

This study was a first effort in exploring the SRSD PLEASE writing intervention for high-school students with ASD and assess planning and draft-writing as a distinct written product. SRSD writing interventions that target planning, theme development, and organization might be helpful for students with ASD who present similar characteristics to those of the students in this study. Researchers and educational professionals should explore this and other SRSD strategies as a way to support children with ASD develop their writing and self-regulatory skills in the inclusive classroom.

References

Abbott, R. D., & Berninger, V. W. (1993). Structural equation modeling of relationships among developmental skills and writing skills in primary- and intermediate-grade writers. *Journal of Educational Psychology*, *85*(3), 478–508. https://doi.org/10.1037/0022-0663.85.3.478

Accardo, A. L., Finnegan, E. G., Kuder, S. J., & Bomgardner, E. M. (2019). Writing interventions for individuals with autism spectrum disorder: A research synthesis. *Journal of Autism and Developmental Disorders*, *50*(6), 1–19. https://doi.org/10.1007/s10803-019-03955-9

Alnahdi, G. H. (2015). Single-subject designs in special education: Advantages and limitations. *Journal of Research in Special Educational Needs*, *15*(4), 257–265. https://doi.org/10.1111/1471-3802.12039

Alresheed, F., Machalicek, W., Sanford, A., & Bano, C. (2018). Academic and related skills interventions for autism: A 20-year systematic review of single-case research. *Review Journal of Autism and Developmental Disorders*, *5*(4), 311–326. https://doi.org/10.1007/s40489-018-0141-9

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR* (4th ed., text rev.). http://voyager.library.uvic.ca/vwebv/holdingsInfo?bibId=1209323

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5* (5th ed.). Washington, D.C: American Psychiatric Association.

Asaro-Saddler, K. (2014). Self-regulated strategy development: Effects on writers with autism spectrum disorders. *Education and Training in Autism and Developmental Disabilities*, *49*(1), 78-91. https://doi.org/10.2307/23880656

Asaro-Saddler, K. (2016). Writing instruction and self-regulation for students with autism spectrum disorders: A systematic review of the literature. *Topics in Language Disorders*, *36*(3), 266–283. https://doi.org/10.1097/TLD.0000000000000093

Asaro-Saddler, K., & Bak, N. (2012). Teaching children with high-functioning autism spectrum disorders to write persuasive essays. *Topics in Language Disorders*, *32*(4), 361–378. https://doi.org/10.1097/TLD.0b013e318271813f

Asaro-Saddler, K., & Bak, N. (2014). Persuasive writing and self-regulation training for writers with autism spectrum disorders. *The Journal of Special Education*, *48*(2), 92–105. https://doi.org/10.1177/0022466912474101

Asaro-Saddler, K., & Saddler, B. (2010). Planning instruction and self-regulation training: Effects on writers with autism spectrum disorders. *Exceptional Children*, *77*(1), 107–124. https://doi.org/10.1177/001440291007700105

Asaro, K., & Saddler, B. (2009). Effects of planning instruction on a young writer with Asperger syndrome. *Intervention in School and Clinic*, *44*(5), 268–275. https://doi.org/10.1177/1053451208330895

B.C. Government. (2006). *Special education*. Gov.bc.ca. Retrieved July 8, 2018, from https://www2.gov.bc.ca/gov/content/education-training/administration/legislation-policy/public-schools/special-education

B.C. Government. (2018). *New curriculum info.* BC's New Curriculum. Retrieved July 8, 2018, from https://curriculum.gov.bc.ca/curriculum-info

B.C. Ministry of Education. (2000). *Teaching students with autism: A resource guide for schools*. Gov.bc.ca. Retrieved July 8, 2018, from https://www2.gov.bc.ca/assets/gov/education/kindergarten-to-grade-12/teach/teaching-

tools/inclusive/autism.pdf

Bazerman, C., Applebee, A. N., Berninger, V. W., Brandt, D., Graham, S., Matsuda, P. K., Murphy, S., Wells-Rowe, D., Schleppegrell, M. (2017). Taking the long view on writing development. *Research in the Teaching of English*, *51*(3), 351–360. https://www.researchgate.net/publication/317204430

Berninger, V., & Amtmann, D. (2003). Preventing written expression disabilities through early and continuing assessment and intervention for handwriting and/or spelling problems: Research into practice. In H. L. Swanson, K. R. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 345–363). New York, NY: Guilford Press.

Berninger, V., Vaughan, K., Abbott, R., Begay, K., Coleman, K., Curtin, G., Hawkins, J. M., Graham, S. (2002). Teaching spelling and composition alone and together: Implications for the simple view of writing. *Journal of Educational Psychology*, *94*(2), 291–304. https://doi.org/10.1037/0022-0663.94.2.291

Brown, H. M., & Klein, P. D. (2011). Writing, Asperger syndrome and theory of mind. *Journal of Autism and Developmental Disorders*, *41*(11), 1464–1474. https://doi.org/10.1007/s10803-010-1168-7

Carr, M. E., Moore, D. W., & Anderson, A. (2014). Self-management interventions on students with autism: A meta-analysis of single-subject research. *Exceptional Children*, *81*(1), 28–44. https://doi.org/10.1177/0014402914532235

Cook, K. B., & Bennett, K. E. (2014). Writing interventions for high school students with disabilities. *Remedial and Special Education*, *35*(6), 344–355. https://doi.org/10.1177/0741932514523140

Cowan, N. (2017). The many faces of working memory and short-term storage. *Psychonomic*

Bulletin and Review, *24*(4), 1158–1170. https://doi.org/10.3758/s13423-016-1191-6

Delano, M. E. (2007a). Improving written language performance of adolescents with Asperger syndrome. *Journal of Applied Behavior Analysis*, *40*(2), 345–351. https://doi.org/10.1901/jaba.2007.50-06

Delano, M. E. (2007b). Use of strategy instruction to improve the story writing skills of a student with Asperger syndrome. *Focus on Autism and Other Developmental Disabilities*, *22*(4), 252–258. https://doi.org/10.1177/10883576070220040701

DeLuca, C. (2013). Toward an interdisciplinary framework for educational inclusivity. *Canadian Journal of Education*, *36*(1), 305–348. http://www.jstor.org/stable/canajeducrevucan.36.1.305

Dickerson, S., & Calhoun, S. (2008). WISC-IV and WIAT-II profiles in children with high-functioning autism. *Journal of Autism and Developmental Disorders*, *38*(3), 428–439. https://doi.org/10.1007/s10803-007-0410-4

Elias, R., & White, S. W. (2018). Autism goes to college: Understanding the needs of a student population on the rise. *Journal of Autism and Developmental Disorders*, *48*(3), 732–746. https://doi.org/10.1007/s10803-017-3075-7

Finnegan, E., & Accardo, A. L. (2018). Written expression in individuals with autism spectrum disorder: A meta-analysis. *Journal of Autism and Developmental Disorders*, *48*(3), 868–882. https://doi.org/10.1007/s10803-017-3385-9

Gilligan, T. (2005). Intervention. In *Encyclopedia of School Psychology* (pp. 273–274). Thousand Oaks: SAGE Publications, Inc. https://doi.org/http://dx.doi.org/10.4135/9781412952491.n152

Graham, S., & Harris, K. (2000). The role of self-regulation and transcription skills in writing

and writing development. *Educational Psychologist*, *35*(1), 3–12. https://doi.org/10.1207/S15326985EP3501_2

Graham, S., & Fulton, M. L. (2015). Writing instruction. In *International Encyclopedia of the Social & Behavioral Sciences* (pp. 767–772). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.92050-6

Graham, S., Gillespie, A., & McKeown, D. (2013). Writing: Importance, development, and instruction. *Reading and Writing*, *26*(1), 1–15. https://doi.org/10.1007/s11145-012-9395-2

Grossman, M., Peskin, J., & San Juan, V. (2013). Thinking about a reader's mind: Fostering Communicative clarity in the compositions of youth with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *43*(10), 2376–2392. https://doi.org/10.1007/s10803-013-1786-y

Harris, K. R., Graham, S., Mason, L., & Friedlander, B. (2008). *Powerful writing strategies for all students* (1st ed.). Baltimore, MD: Brookes Publishing.

Harris, K. R., Graham, S., & Mason, L. H. (2003). Self-regulated strategy development in the classroom: Part of a balanced approach to writing instruction for students with disabilities. *Focus on Exceptional Children*, *35*(7), 1–16. http://ezproxy.library.uvic.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=11604543&site=ehost-live&scope=site

Hayes, J. R. (1996). A new framework for understanding cognition and affect in writing. In C. M. Levy & S. Ransdell (Eds.), *The science of writing: Theories, methods, individual differences, and applications* (pp. 1–27). Mahwah, NJ: Erlbaum Associates, Inc. Retrieved from http://psycnet.apa.org/record/1996-98203-001

Hayes, J. R. (2012). Modeling and remodeling writing. *Written Communication*, *29*(3), 369–388. https://doi.org/10.1177/0741088312451260

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, *71*(2), 165–179. https://doi.org/10.1177/001440290507100203

Jackson, L. G., Duffy, M. L., Brady, M. P., & McCormick, J. (2018). Effects of learning strategy training on the writing performance of college students with Asperger's syndrome. *Journal of Autism and Developmental Disorders*, *48*(3), 708–721. https://doi.org/10.1007/s10803-017-3170-9

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, (2), 217–253. http://mail.neurodiversity.com/library_kanner_1943.pdf

Kiuhara, S. A., O'Neill, R. E., Hawken, L. S., & Graham, S. (2012). The effectiveness of teaching 10th-grade students STOP, AIMS, and DARE for planning and drafting persuasive Text. *Exceptional Children*, *78*(3), 335–355. https://doi.org/10.1177/001440291207800305

Lai, M. C., Lombardo, M. V., & Baron-Cohen, S. (2014). Autism. *The Lancet*, *383*(9920), 896–910. https://doi.org/10.1016/S0140-6736(13)61539-1

MacArthur, C., & Graham, S. (2006). Writing research from a cognitive perspective. In C. A. . MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (p. 464).

MacArthur, C., Graham, S., & Fitzgerald, J. (Eds.). (2006). *Handbook of writing research* (2nd ed.). Guilford Press.

MacArthur, C., & Philippakos, Z. (2010). Instruction in a strategy for compare–contrast writing. *Exceptional Children*, *76*(4), 438–456.

https://doi.org/10.1177/001440291007600404

Mash, E. J., & Wolfe, D. A. (2016). *Abnormal child psychology* (6th ed.). Boston, MA: Cengage Learning.

Mason, L. H., & Shriner, J. G. (2008). Self-regulated strategy development instruction for writing an opinion essay: Effects for six students with emotional/behavior disorders. *Reading and Writing*, *21*(1–2), 71–93. https://doi.org/10.1007/s11145-007-9065-y

Milford, T., & Harrison, G. L. (2010). Using the PLEASE strategy with a struggling middle school writer with a disability. *Intervention in School and Clinic*, *45*(5), 326–332. https://doi.org/10.1177/1053451209359080

Mourgkasi, V., & Mavropoulou, S. (2018). Story composition, mental state language and self-regulated strategy instruction for writers with autism spectrum conditions. *Journal of Research in Special Educational Needs*, *18*(1), 36–49. https://doi.org/10.1111/1471-3802.12391

Olde Dubbelink, L. M. E., & Geurts, H. M. (2017). Planning skills in autism spectrum disorder across the lifespan: A meta-analysis and meta-regression. *Journal of Autism and Developmental Disorders*, *47*(4), 1148–1165. https://doi.org/10.1007/s10803-016-3013-0

Parker, R. I., Vannest, K. J., & Davis, J. L. (2014). Non-overlap analysis for single-case research. In *Single-case intervention research : Methodological and statistical advances* (pp. 127–152). Washington: American Psychological Association.

Pennington, R. C., & Delano, M. E. (2012). Writing instruction for students with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, *27*(3), 158–167. https://doi.org/10.1177/1088357612451318

Psychological Corporation. (2002). *WIAT-II : Wechsler Individual Achievement Test.* (2nd ed.). San Antonio: Psychological Corp. https://www.worldcat.org/title/wiat-ii-wechsler-individual-achievement-test-examiners-manual/oclc/50587539

Psychological Corporation. (2009). *WIAT III : Wechsler Individual Achievement Test.* (3rd ed.). San Antonio, Tex. : Psychological Corp. https://www.worldcat.org/title/wiat-iii-wechsler-individual-achievement-test/oclc/466111292

Riley-Tillman, C., & Burns, M. (2009). *Evaluating educational interventions: Single-case design for measuring response to intervention*. Guilford Press. http://voyager.library.uvic.ca/vwebv/holdingsInfo?bibId=3156036

Robinson, S., Goddard, L., Dritschel, B., Wisley, M., & Howlin, P. (2009). Executive functions in children with autism spectrum disorders. *Brain and Cognition, 71,* 362–368. https://doi.org/10.1016/J.BANDC.2009.06.007

Rogers, L. A., & Graham, S. (2008). A meta-analysis of single subject design writing intervention research. *Journal of Educational Psychology*, *100*(4), 879–906. https://doi.org/10.1037/0022-0663.100.4.879

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Schneider, A. B., Codding, R. S., & Tryon, G. S. (2013). Comparing and combining accommodation and remediation interventions to improve the written-language performance of children with asperger syndrome. *Focus on Autism and Other Developmental Disabilities*, *28*(2), 101–114. https://doi.org/10.1177/1088357613475811

Scruggs, T. E., & Mastropieri, M. A. (2001). How to summarize single-participant research:

Ideas and applications. *Exceptionality*, *9*(4), 227–244. https://doi.org/10.1207/S15327035EX0904_5

Spencer, V. G., Evmenova, A. S., Boon, R. T., & Hayes-Harris, L. (2014). Review of research-based interventions for students with autism spectrum disorders in content area instruction: Implications and considerations for classroom practice. *Education and Training in Autism and Developmental Disabilities*, *49*(3), 331–353. https://doi.org/10.2307/23881252

Swanson, H. L., Harris, K. R., & Graham, S. (Eds.). (2003). *Handbook of learning disabilities*. New York, NY: Guilford Press.

Taft, R. J., & Mason, L. H. (2011). Examining effects of writing interventions: Highlighting results for students with primary disabilities other than learning disabilities. *Remedial and Special Education*, *32*(5), 359–370. https://doi.org/10.1177/0741932510362242

Tolchinsky, L. (2006). From text to language and back: The emergence of written language. In C. A, MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (2nd ed.). Guilford Press.

Torrance, M. (2006). Understanding planning in text production. In Charles; MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (2nd ed.). Guilford Press.

Vivanti, G. (2015). Autism spectrum disorders. In *International Encyclopedia of the Social & Behavioral Sciences* (2nd ed., pp. 275–281). Elsevier.

Wagner, R. K., Puranik, C. S., Foorman, B., Foster, E., Wilson, L. G., Tschinkel, E., & Kantor, P. T. (2011). Modeling the development of written language. *Reading and Writing*, *24*(2), 203–220. https://doi.org/10.1007/s11145-010-9266-7

Welch, M. (1992). The PLEASE strategy: A metacognitive learning strategy for improving

the paragraph writing of students with mild learning disabilities. *Learning Disability Quarterly, 15*(2), 119–128. https://doi.org/10.2307/1511013

White, S. W., Elias, R., Capriola-Hall, N. N., Smith, I. C., Conner, C. M., Asselin, S. B., Howlin, P., Getzel, E. E., & Mazefsky, C. A. (2017). Development of a college transition and support program for students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *47*(10), 3072–3078. https://doi.org/10.1007/s10803-017-3236-8

Wolery, M., Busick, M., Reichow, B., & Barton, E. E. (2008). Comparison of overlap methods for quantitatively synthesizing single-subject data. *The Journal of Special Education*, *44*(1), 18–28. https://doi.org/10.1177/0022466908328009

Woods-Groves, S., Hua, Y., Therrien, W. J., Kaldenberg, E. R., Hendrickson, J. M., Lucas, K. G., & McAninch, M. J. (2014). An investigation of strategic writing instruction for post-secondary students with developmental disabilities. *Education and Training in Autism and Developmental Disabilities*, *49*, 248–262. https://doi.org/10.2307/23880608

Zimmerman, B. J., & Risemberg, R. (1997). Becoming a self-regulated writer: A social cognitive perspective. *Contemporary Educational Psychology*, *22*(1), 73–101. https://doi.org/10.1006/CEPS.1997.0919