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Research to Practice

Focusing on individuals with
autism, intellectual disability and other developmental disabilities

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The *DADD Online Journal* integrates research and practice, reflecting the need for evidence-based and practice informed strategies and interventions within this diverse field. Topics include: Autism Spectrum Disorder, Assistive & Adaptive Technology, Early Childhood, Intellectual Disability, Mental Health, Multiple Disabilities, Paraprofessionals, Employment, Post-Secondary, and Transitions.

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Research Informed Practice in Autism, Intellectual Disability, and Developmental Disabilities

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On January 16 – 18, 2019, the Council for Exceptional Children Division on Autism and Developmental Disabilities (DADD) sponsored its Twentieth International Conference: Research Informed Practice in Autism, Intellectual Disability and Developmental Disabilities. The conference was held at the Sheraton Maui Kaanapali Beach Resort in Lahaina, HI. The DADD Board of Directors decided to devote this issue of the *DADD Online Journal* to conference papers. The conference brought together educators from school and college classrooms from all over the world. The conference included pre-conference training institutes and strands on assistive and adaptive technology, autism spectrum disorder, intellectual disability, mental health, paraprofessionals, parental engagement, post-secondary transitions, multiple disabilities and applied behavior analysis. The conference provided many parents, teacher educators, researchers, teachers, and other practitioners an opportunity to gather to learn the most current information related to providing services for individuals with autism, intellectual disability, and developmental disabilities.

This issue of the *DADD Online Journal* can enable those who attended the conference to see expanded papers, prepared by presenters, and also give those who were unable to attend an opportunity to benefit from the thoughtful

work done by conference participants.

Presenters were asked to submit papers based on their conference presentations. Papers submitted went under a blind review process by the Guest Reviewers and Guest Editors who selected the papers for publication. We think the selection of papers represents an interesting assortment of topics and formats ranging from discussion papers to data based research to descriptions of classroom techniques. The papers selected do not necessarily represent all the topics covered at the conference but they do give a good idea of the variety and quality of the presentations. We would like to thank those authors who submitted papers for their efforts in making this issue of the *DADD Online Journal* possible.

Researchers suggest students with intellectual disability (ID) experience limited exposure to grade-aligned mathematics content and the general education mathematics setting. In the first article, Dana Goya, Paula R. Uloa, and Jenny C. Wells describe the unique challenges of teaching mathematics concepts to students with ID, particularly at the secondary level, in their paper “A Review of Interventions for Teaching Mathematics to Secondary Students with Intellectual Disabilities”. Their review builds off of the growing research base on academic instruction for students with ID. In the paper, the authors share

highlights and themes from 34 group and single-case design mathematics interventions for secondary students (grades 6-12) with ID. The paper includes a discussion of the variety of instructional practices used and the focal mathematical content (functional skills, basic math skills, and/or grade-aligned concepts) in the reviewed interventions. The authors conclude with a thoughtful discussion on the need to extend the research base to general education classrooms to further facilitate access to the general curriculum. Additionally, they suggest evaluating the most frequently used mathematics instructional practices to determine if they would qualify as evidence-based practices for students with ID.

Many students with autism spectrum disorder (ASD) struggle developing and sustaining meaningful relationships with peers, which some researchers attribute to the “hidden” nature of ASD. This gives individuals with ASD and their families a decision: Do they disclose their ASD diagnosis to peers or not? In the next article, “I have Autism”: A Review of the Literature on Sharing Diagnosis with Peers”, Melissa A. Sreckovic, Tia R. Schultz, Eric Alan Common, and Suzanne Kucharczyk explore this question through a literature review of research examining the impacts of ASD diagnosis disclosure on peer attitudes and perceptions. In their review, the authors identify and synthesize 10 studies that explore how peers in K-12 and college settings respond when an ASD diagnosis is shared through surveys, video vignettes, and written case studies. As noted in their findings, peers in the reviewed studies had more positive attitudes about ASD when strategies for how to interact with individuals with ASD accompanied the diagnosis disclosure. The authors conclude by discussing the potential of diagnosis disclosure on advancing inclusion.

In their paper, “Collaboration to Improve Employment Outcomes for Youth with Disabilities: Implications of the Pre-ETS Components of WIOA and IDEA Transition Requirements”, Joshua P. Taylor, Holly N. Whittenberg, Colleen A. Thoma, Tonya Gokita, and Gabrielle S. Pickover provide a helpful overview of the Workforce Innovation and Opportunity Act (WIOA) of 2014 and discuss the intersection of vocational rehabilitation and IDEA. The WIOA, which amended the Rehabilitation Act of 1973, emphasizes the need for competitive and integrated employment for individuals with disabilities and mandates pre-employment transition services (pre-ETS) prior to graduation. This is particularly important for individuals with intellectual and developmental disabilities, many of whom work in segregated work settings after graduation. In their paper, the authors highlight the need for interagency collaboration between local educational and vocational rehabilitation agencies in order to achieve the common goal of competitive and integrated employment. They conclude the paper by providing a helpful table that identifies potential pre-ETS partners and activities that practitioners can use to guide transition planning.

The goal of single-case research is to design interventions that result in meaningful outcomes and improvements in quality of life. Social validity has long been the construct through which to measure those outcomes in single-case research designs (SCRD). In the next article, “An Analysis of Social Validity Prevalence and Measurement within *Education and Training in Autism and Developmental Disabilities*”, Stacy L. Carter and John J. Wheeler extend previous reviews on social validity by examining the prevalence of social validity measurement in SCRDS published in ETADD between 1997 and 2018. In their review, the authors

analyzed how many studies measured social validity overall, how many studies reported on total construct social validity, and how social validity was measured in each study. They defined total construct social validity as (a) reporting on the goals, procedures, and effects of a study; and (b) analyzing the social validity data through tables, graphs, and descriptive data (quotes and written explanation). The authors note that while ETADD frequently publishes SCRDS, very few (i.e., 7%) of the published studies report on total construct social validity, which may provide a more meaningful and thorough analysis of intervention outcomes. The authors conclude by providing thoughtful suggestions for SCRDS researchers on how to define and measure social validity.

“Individuals with Differences: Portrayal of Characters with Disabilities in Newbery Award-Winning Books 2009-2019” by Hannah Grow, Sharon Black, Kellie Egan, Tina M. Taylor, Kimberly Moss, Rachel Wadham, and Mary Anne Prater provides a fascinating examination of how disability is represented in eight Newbery award winning or honors children’s books. The Newbery Medal is given each year to distinguished contributions to American literature for children, and is one of the most prestigious award in children’s literature. The authors of this article examined how disability was portrayed in the eight books, the accuracy and frequency of how disability was portrayed, how characters with disabilities were portrayed, and what exemplary practices were featured for characters with disabilities. The *Rating Scale for Quality Characterizations of Individuals with Disabilities in Children’s Literature* was used to evaluate each of the books. Emotional disturbance and deafness were the most frequently portrayed disabilities, and for the most part, characters with disabilities were portrayed positively, although a few

disturbing exceptions did exist. Most interactions involving characters with disabilities were acceptable, though too often characters with emotional disturbance were depicted unacceptably. Grow and colleagues conclude with recommendations for practitioners with regard to the use of books, like the Newbery award books, to promote acceptance and inclusion.

In the article “Literacy Instruction for Students with Autism Spectrum Disorder in Inclusive Settings”, Elizabeth Finnegan categorizes over 20 research-based strategies and supports for providing literacy instruction to individuals with autism spectrum disorder in inclusive settings through a multi-tiered system of supports (MTSS). Strategies and supports are described as being a means for differentiated support, targeted support, or intensive support. The MTSS model offers flexible structure for teachers, IEP teams, and schools to deliver instruction on literacy skills in means that can also incorporate behavioral supports as necessary.

To support leaders of the growing number of post-secondary programs for students with intellectual and developmental disabilities, Debrah Leach’s article “Effectively Utilizing Peer Mentors to Increase Academic and Social Engagement” describes methods for enhancing inclusive college experiences. Guidelines for training and supporting peer mentors include tapping into their strengths and interests to effectively utilize all resources. The article includes helpful examples from a successful post-secondary program, including a mentor policy, questions for peer mentor online training videos, and mentor questionnaire.

Cean R. Colcord, Juliet Hart Barnett, and Stanley H. Zucker report on a promising approach to teaching reading skills to

students with ASD who have difficulty reading using the peer-assisted learning strategy (PALS). In their article, “Peer-Assisted Learning Strategy (PALS) to Address Reading Challenges in a Second-grade Student with Autism Spectrum Disorder,” these authors highlight findings discussing the difficulty many children with ASD experience in reading comprehension while contrasting that with relative strengths in word decoding abilities. Colcord and colleagues overview the variability of reading abilities among many children with ASD, and lament the limited research on these issues in the current literature base. One approach that has been validated involves peer-mediated strategies, including PALS, which is an evidence-based peer-mediated strategy for students with reading difficulties, and yet, like the evidence-base in other areas of reading and literacy for students with ASD, there have been only a few studies of the PALS process with students with ASD. Colcord, Hart Barnett, and Zucker then present results from a study of PALS on literacy skills of a 2nd grade struggling reader with ASD. Implementing the PALS intervention as presented over eight lessons, the student showed positive changes in decoding, fluency, and comprehension. Though clearly exploratory in nature, the study provides promising indications that PALS can be useful to address literacy issues for students with ASD and that such efforts should be undertaken.

In “Privilege, Social Identity, and Autism: Preparing Preservice Practitioners for Intersectional Pedagogy,” Gloria Y. Niles and Elizabeth A. Harkins Monaco examine how educational experiences for students with autism that are guided by and adopt an intersectional approach can move away from deficits-based understandings of disability toward strengths-based approaches. These issues of intersectionality, which focus on

identity, marginalization, inequality, and power, seem particularly pertinent for youth and adults with autism, who often lay claim to their neurodiverse identity as a source of pride and strength, rather than disability and deficit. Niles and Harkins Monaco explore historic understandings of disability rooted in medical and disease models, socio-political models of disability that emerged to combat oppression and ableism, and the role of conscious and unconscious bias and social privilege in society and schools. These authors argue that intersectional concepts are critical to understanding the lived experiences of people with autism, and that teacher training and education would be well served by adopting intersectional awareness and practices. Niles and Harkins Monaco suggest strategies that will move the field toward intersectional pedagogy: (1) Seek intersectional learning opportunities; (2) Be aware of ways in which intersectionality can be infused into the curriculum and college environment; (3) Teach at the intersections at which marginalized people experience education and present information representing multiple minoritized individuals; (4) Step out of one’s comfort zone to teach for social justice; and (5) Mitigate the biases that exist in most materials and teacher training systems. Only when these steps are taken, Niles and Harkins Monaco argue, will practitioners be equipped to serve and advocate for all populations, including students with autism, effectively.

Mindfulness is a practice that is gaining popularity and visibility within the disability world. In the next article, “Effectiveness of Mindfulness-Based Interventions for Individuals with Autism Spectrum Disorder: A Systematic Literature Review,” Amanda K. McMahan, Donald D. McMahan and Kathryn Hirshfelder report on a systematic literature review of mindfulness practices with people on the autism spectrum. The

authors discuss the social and communication limitations that many people with ASD experience and the fact that people with ASD are at increased risk for mental health disorders. Mindfulness, defined as the ability to non-judgmentally observe emotions, sensations, or cognitions in moment-to-moment awareness, has the potential to provide means of reducing stress and anxiety for people with ASD and improve mental health outcomes. The search strategy located 12 studies. The review identified studies that examined the impact of mindfulness on aggression, self-injury, and other challenging behaviors, as well as depression and anxiety. These authors conclude that mindfulness interventions had potential for positively impacting positive mental health and reducing anxiety and depression and decreasing the exhibition of problem behaviors for people with ASD. The study clearly showed the need for more and more rigorous research with a wider array of outcome measures, but the review certainly justifies devoting more time and effort to such research as a potential way to improve the lives of people with ASD.

The question of “for whom” practices are evidence-based, or perhaps “from whom” the practices are derived, is an important parallel discussion to the way in which these practices are taken up. Kayla Temper, Meaghan M. McCollow, L. Lynn Stansberry Brusnahan, Lisa Liberty, Debra Cote, and Abdullah Alshehri set out to examine this through a review of reported participant characteristics in the journal *Education and Training in Autism and Developmental Disabilities* across a 15-year period in the article “But for

Whom? A Review of Participant Characteristics in a Special Education Journal.” Authors found an overall lack of diversity among studies that reported race and ethnicity, socioeconomic status, home language, and gender. Authors find concern with the vague participant descriptors in research reports and encourage researchers, editors, and researcher funders to include rich participant descriptions in research reports involving individuals with disabilities.

In the last article, “An Exploratory Study Using Participation Plans for Inclusive Social Studies Instruction”, Jennifer Kurth, Amanda L. Miller, Samantha Gross Toews, Megan Gross, Amber Collier, and Tori Ventura report results of an exploratory single-case study on using participation plans to support three students with intellectual and developmental disability in inclusive high school social studies classrooms. Participation plans included three core components: embedded instruction, a system of least prompts, and individualized adaptations focused around student prioritized skills. Results indicate that these participation plans may be an effective and minimally invasive strategy for supporting learning of prioritized skills in inclusive settings.

The conference provided educators and researchers with the opportunity to explore current research, topical issues, and best practices relating to autism, intellectual disability, and development disabilities. We hope readers of this research to practice issue of the *DADD Online Journal* find the information valuable and timely.

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A Review of Interventions for Teaching Mathematics to Secondary Students with Intellectual Disabilities

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Abstract: This systematic review analyzed available literature published from 2008 to 2018 on interventions for teaching mathematics to secondary students with intellectual disabilities (ID). Across the 34 included studies from peer-reviewed journals, a total of 109 secondary students with ID received interventions targeting various mathematics concepts and skills. Findings showed research teams generally taught functional skills, basic mathematics skills, or grade level standards-aligned concepts to secondary students with ID. Research teams used a variety of interventions to teach these students mathematics, including prompting procedures, instructional approaches, manipulatives, technology, and concept-specific strategies. Frequently used practices for teaching mathematics to secondary students with ID included simultaneous prompting procedure, constant time delay, manipulatives, and instructional approaches such as the concrete-representational-abstract approach and modified schema-based instruction. Future research should examine the efficacy of these interventions as well as mathematics instruction for secondary students with ID aligned to grade level standards with functional content embedded.

In addition to communication, daily living, and social demands, today’s world has greatly increased the need for mathematical competency. Individuals with intellectual disabilities (ID) face expectations in jobs and daily living which require understanding of mathematical concepts and skills such as using numerically operated machinery and interpreting workplace charts and graphs (Saunders, Bethune, Spooner, & Browder, 2013). Those who can apply mathematical skills to a job, during leisure activities, or independent living situations develop greater independence and may experience a higher quality of life (Spooner, Saunders, Root, & Brosh, 2017). Additionally, students with ID who learn advanced mathematical concepts (e.g., solving algebraic equations, fraction sense) decrease risks of potentially being taken advantage of due to poor numeracy

skills (e.g., being short changed at a register, underpaid wages) and increase their ability to positively interact with their community (Prendergast, Spassiani, & Roche, 2017).

Forty-one states, the District of Columbia, and four U.S. territories have adopted the Common Core State Standards (Common Core State Standards Initiative, 2017). With states’ vast adoption of the Common Core State Standards, students, including those with ID, are held to rigorous standards of mathematical knowledge and skills needed to thrive in the 21st century (Saunders et al., 2013; Spooner et al., 2017; Wakeman, Karvonen, & Ahumada, 2013). Research supports general curriculum standards-aligned mathematical instruction for students with severe disabilities (Browder, Spooner, Ahlgrim-Delzell, Harris, & Wakeman, 2008;

Browder, Trela, et al., 2012), yet many students with severe disabilities lack prerequisite early numeracy skills (e.g., number recognition, patterning) needed to access standards-aligned mathematics concepts (Jimenez & Stanger, 2017). Although slow developmental progression of students with ID impacts their ability to acquire early numeracy skills, research indicated lack of grade level standards-aligned mathematical experiences or exposure more often contributed to their lack of early numeracy skills (Sarama & Clements, 2009). Furthermore, although the Individuals with Disabilities Education Act (2004) mandates students with disabilities, including those with more severe disabilities such as ID, have access to the general education curriculum and be educated in the general education setting to the greatest extent possible, recent data showed more than 50% of students with ID (ages 6 through 21) received instruction in the general education setting less than 40% of the day (U.S. Department of Education, 2017). Thus, students with ID are in need of greater exposure to both grade level standards-aligned content and the general education classroom setting.

With respect to secondary (middle and high school) students with ID, lack of mathematical experiences or exposure contributes to widening gaps in skills. As students progress through academic years, these gaps widen and problem solving skills become increasingly more difficult (Jimenez & Stanger, 2017). Problem solving skills beyond time and money, which are vital for success in post-school outcomes, become out of reach for secondary students with ID (Kearns, Towles-Reeves, Kleinert, Kleinert, & Thomas, 2011). In addition, research on teaching mathematics to students with ID emphasizes a need for repetitive instructional practices and suggests students with ID are

not presented with enough knowledge-related challenges, including learning new and complex concepts (Prendergast et al., 2017).

Several research teams previously reviewed the literature on teaching mathematics to students with ID (Bowman, McDonnell, Ryan, & Fudge-coleman, 2019; Browder et al., 2008; Hord & Bouck, 2012; Hudson, Rivera, & Grady, 2018). Although these analyses provided insight on teaching mathematics to students with cognitive and developmental disabilities, their reviews are limited to an analysis of participants with specific levels of ID. Browder et al. (2008) and Hudson et al. (2018) examined practices for teaching mathematics to students with significant cognitive disabilities. Bowman et al. (2019) reviewed mathematics instruction for students with moderate and severe disabilities. Hord and Bouck's (2012) review examined mathematics instruction for students with mild ID. To date, no existing reviews on teaching mathematics to students with ID encompassed participants with all levels of ID. By definition, an individual with ID should have a measured IQ less than approximately 70 to 75 (American Association on Intellectual and Developmental Disabilities, 2018; Polloway, Patton, & Nelson, 2011). Additionally, all existing reviews analyzed a broad range of participant grade levels. To date, no reviews specifically examined mathematics instruction for secondary students with ID. Considering the implications of post-school application of mathematics for students with ID, a need for a review of the literature on teaching mathematics to secondary students with ID exists.

Research Purpose and Questions

The purpose of this systematic literature review is to summarize and synthesize recent research on interventions for teaching

mathematics to secondary students with ID. In particular, this review builds on existing reviews of teaching mathematics to students with ID by: (a) encompassing all participants with ID, regardless of severity level; (b) concentrating on secondary students (grades 6 through 12) with ID; and (c) reviewing studies published from 2008 to 2018. This review will provide greater insight on current nuances of teaching mathematics to secondary students with ID, including settings of instruction, interventionists, interventions used, as well as mathematics concepts and skills secondary students with ID are capable of learning. The research questions this review seeks to answer are: (a) What interventions have research teams used to teach mathematics to secondary students with ID? (b) Which mathematics concepts and skills have research teams taught to secondary students with ID? and (c) How can results from research studies on interventions for teaching mathematics to secondary students with ID inform teaching practices? In this review, secondary students with ID are defined as participants in grades 6 through 12 and documented as having an ID or an IQ of 75 or lower.

Method

The first author conducted electronic database searches of Google Scholar, Educational Resources Information Center, Professional Development Collection, ProQuest, and a university library database search engine. Primary search terms were *intellectual disability*, *intellectual disabilities*, *mathematics*, *study*, *secondary*, *high school*, and *middle school* and secondary search terms were *algebra*, *addition*, *computation*, *division*, *fluency*, *geometry*, *number system*, *multiplication*, *purchasing*, *problem solving*, *proportions*, *ratios*, and *subtraction*. Results were limited to peer-reviewed journal articles published between 2008 and 2018. Following

electronic database searches, the first author conducted ancestral reference searches of all included articles published from 2015 to 2018 as well as a hand search of *Education and Training in Autism and Developmental Disabilities*.

For an article to be included in this review, it had to meet the following criteria: (a) applied an experimental or quasi-experimental design for group or single-case studies, (b) had at least one participant who was a secondary student, grade 6 through 12, with ID (c) applied a distinctive intervention as the independent variable, (d) reported dependent variable data which measured participant performance or understanding of at least one mathematics concept or skill, (e) reported specific dependent variable data of individual students or groups of students with ID, and (f) published in a peer-reviewed journal in English between the years of 2008 and 2018.

Electronic database searches yielded 23 studies which met the inclusion criteria for this review. Ancestral searches resulted in eight studies for inclusion. Two studies from the hand search were included. Finally, one additional included article was identified as a result of personal contact with an author. In total, the first author located 34 studies which met inclusion criteria. Using an inclusion criteria table, the second author randomly selected and appraised 20 included articles (59%). Consensus was reached on 100% of reviewed articles.

Results

The following sections summarize the included articles' participant characteristics, settings, interventionists, interventions used, and targeted mathematics concepts. Table 1 also overviews the participant characteristics, interventions used, targeted mathematics concepts, and outcomes of each included article.

Table 1. *Summary of Included Articles on Interventions for Teaching Mathematics to Secondary Students with Intellectual Disabilities*

Reference	Participants			Intervention	Mathematics Concept	Outcomes
	Gender	IQ	Ages			
Bouck, Shurr, Bassette, Park, & Whorley (2018)	1 M, 1 F	53 - 68	13	Concrete & app-based manipulatives	Adding fractions w/ unlike denominators	<i>M</i> increase of 100% (concrete & app-based manipulatives)
Browder et al. (2018)	3 M, 3 F	<40 - 55	11 - 13	MSBI	Addition & subtraction WP	<i>M</i> intervention steps (out of 12): 8.4 (group), 10.5 (compare), 10.7 (group/compare discrimination) 10.9 (change), 11 (mixed discrimination)
Root, Cox, Hammons, Saunders, & Gilley (2018)	2 M, 1 F	52 - 68	13 - 18	MSBI	Percent of change WP	.87 overall Tau-U
Root, Henning, & Boccumini (2018)	1 M, 1 F	58	11 - 12	MSBI	Algebraic word problem solving	.87 overall Tau-U
Saunders, Spooner, & Davis (2018)	2 M, 1 F	42 - 54	13 - 14	Video prompting	Video simulation real-world problems	62, 56, & 48% increase
Weng & Bouck (2018)	4 M	45 - 65	12 - 20	App-based NL	Price comparison	60, 53, & 53 (w/ & w/out dots) increase for 3 Ps; 42% (w/ dots) & 35% (w/out dots) increase for 1 P
Bouck, Bassette et al. (2017)	1 M	70	13	VRA	Equivalent fractions	Tau-U of 100%
Bouck, Chamberlain, & Park (2017)	1 M, 1 F	62 - 68	13 - 14	Concrete & app-based manipulatives	Subtraction w/ regrouping WP	Tau-U of 69% (concrete) & 83% (app-based) for 1 P, 100% (concrete & app-based) for 1 P
Bouck, Park, & Nickell (2017)	2 M, 1 F	56 - 74	12	CRA	Change making	Tau-U of 100% for all Ps
Bouck, Park, Sprick et al. (2017)	2 M, 1 F	53 - 70	13	Virtual-Abstract	Adding fractions w/ unlike denominators	Tau-U of 100% for 2 Ps & 78% for 1 P
Root & Browder (2017)	3 F	50 - 58	12 - 14	MSBI	Algebraic WP	75, 71, & 71% increase

Root, Saunders, Spooner, & Brosh (2017)	3 M	42 - 47	14	MSBI	Personal finance problem solving	71, 65, & 61% increase (change-addition); 79, 75, & 71% increase (change-subtraction)
Bouck, Stasangi, & Bartlett (2016)	1 M, 2 F	42 - 56	18 - 21	Audio prompting, paper-based NL	Price comparison	Tau-U of 100% (NL & audio prompting) for 2 Ps, 100% (NL) & 76% (audio prompting) for 1 P
Heinrich, Collins, Knight, & Spriggs (2016)	1 F	56	17	SPP	Identifying GFs, solving linear equations	90% increase (identifying GFs) & 36% increase (solving linear equations)
Weng & Bouck (2016)	1 M, 2 F	42 - 52	14 - 15	NL app, paper-based NL, CTD	Number comparison	44, 28, & 24% increase (paper-based NL); 48, 40, & 24% increase (NL app)
Baker, Rivera, Morgan, & Reese (2015)	2 M, 1 F	43 - 63	12 - 15	Manipulatives, TA	Algebraic equations	67, 66, & 57% increase
Hord & Xin (2015)	3 F	63 - 73	11 - 13	CSA, COMPS	Area, volume	60, 80, & 80% increase
Yakubova, Hughes, & Hornberger (2015)	2 M	70 - 71	17 - 18	Point-of-view video modeling, problem solving checklist	Subtracting fractions w/ unlike denominators WP	95 & 93% increase
Weng & Bouck (2014)	2 M	46 - 57	15 - 17	Video prompting	Price comparison	53% increase for 1 P & 23% decrease for 1 P
Burton, Anderson, Prater, & Dyches (2013)	2 M	61 - 66	13 - 15	Video self-modeling	Change making	99 & 85% increase
Creech-Galloway, Collins, Knight, & Bausch (2013)	3 M, 1 F	41 - 57	15 - 17	SPP	Pythagorean theorem	90, 90, 77, & 54% increase
Karl, Collins, Hager, & Ault (2013)	3 M, 1 F	41 - 55	15 - 18	SPP	Percent increase & decrease WP	<i>M</i> of 11 sessions to meet criterion across all skills
Browder, Jimenez, & Trela (2012)	3 M, 1 F	<40 - 41	11 - 13	Math stories, manipulatives, GO, TA	Geometry, algebra, data analysis, measurement	<i>M</i> increases of: 38% (geometry), 32% (algebra), 41% (data analysis), 35% (measurement)

Browder, Trela et al. (2012)	7 M, 9 F	<i>M</i> : 49	14 - 20	Math stories, manipulatives, GO, TA	Geometry, algebra, data analysis, measurement	<i>M</i> increases of: 28% (math total), 34% (algebra), 35% (geometry), 13% (data), 31% (measurement)
Collins, Hager, & Creech-Galloway (2011)	2 M, 1 F	41- 55	14 - 15	CTD	Computing sales tax	1 P met criterion in 19 sessions, 2 Ps failed to meet criterion
McCallum & Schmitt (2011)	1 F	59	13	Taped problems	Division fact fluency	Immediate and sustained increases across problem sets
Rowe, Cease-Cook, & Test (2011)	2 M, 1 F	63 - 71	16 - 18	Static picture prompting	Making purchases w/ a debit card, tracking expenses	84, 80, & 51% increase
Waters & Boon (2011)	3 M	61 - 64	14 - 16	TouchMath	Subtracting 3-digit money problems w/ regrouping	83, 74, & 69% increase
Fletcher, Boon, & Cihak (2010)	2 M, 1 F	40 - 54	13 - 14	TouchMath, NL	Single-digit addition	<i>M</i> increase of 88% (TouchMath) & 26% (NL)
Bouck, Bassette, Taber-Doughty, Flanagan, & Szwed (2009)	2 M, 1 F	62 - 63	12	FLY Pentop Computer	Multiplication	52, 26, & 19% increase
Rao & Kane (2009)	1 M, 1 F	50 - 66	N/A	SPP	Subtracting decimals w/ regrouping	40 & 45% increase
Rao & Mallow (2009)	1 M, 1 F	49 - 62	14	SPP	Multiplication facts	83% & 74% increase
Cihak & Grim (2008)	2 M, 2 F	35 - 50	15 - 17	Counting-on & next-dollar strategies	Purchasing	<i>M</i> increases of 63% (\$5.00 - \$9.99), 68% (\$10.00 - \$14.99), & 81% (\$15.00 - \$20.00)
Jimenez, Browder, & Courtade (2008)	2 M, 1 F	<i>M</i> : 45	15 - 17	Manipulatives, TA, systematic prompting	Algebraic equations	9, 17, & 31 sessions to meet criterion

Note. COMPS = Conceptual model problem-based solving. CRA = Concrete-representational-abstract. CSA = Concrete-semiconcrete-abstract. CTD = Constant time delay. F = Female. GF = Geometric figure. GO = Graphic organizers. M = Male. *M* = Mean. MSBI = Modified schema-based instruction. NL = Number line. P = Participant. SPP = Simultaneous prompting procedure. TA = Task analysis. VRA = Virtual-representational-abstract. WP = Word problems.

Participant Characteristics

The 34 included studies had a combined total of 109 participants with ID. Of the 109 participants, specific individual IQ measures were reported for 86 students (79%). Two research teams reported an average IQ score of participants, two participants' IQ measures were reported as <40, and two participants were identified as ID with unknown IQs. This review encompassed a wide range of IQs, ranging from 35 to 74. Eight participants had IQs between 70 and 75. Twenty-two participants had IQs between 60 and 69. Twenty-four participants had IQs between 50 and 59. IQ range from 40 to 49 had the greatest number of study participants, with 31 participants in this range. Only three participants with reported IQ measures had IQs less than 40. In accordance with the *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition* (American Psychiatric Association, 2013), majority of these participants would likely be classified as having mild to moderate ID (Boat & Wu, 2015).

All studies, with the exception of Rao and Kane (2009), reported ages of participants. Ages of participants ranged from 11 to 21 years old. Studies reflected a greater number of participants in middle school (grades 6 through 8) with 61 total participants, compared to 32 participants in high school (grades 9 through 12). Browder, Trela, et al.'s (2012) study did not specify which participants were in middle school or high school grade levels, although all participants were at least 14 years old. Gender was also reported for all participants. Male participants outnumbered female participants significantly. Of the 109 participants, 65 were male (60%) and 44 were female (40%).

Settings

Research teams conducted studies in three major types of settings: (a) special education

classrooms, (b) community-based settings, and (c) other settings. Hord and Xin (2015) was the only research team who did not describe their study's specific setting. Eight research teams conducted their studies in a combination of the aforementioned settings. Twenty-two studies were conducted in special education classrooms. Five studies were conducted in community-based settings, such as a local department store or grocery store. Eleven research teams conducted their studies in other settings, which generally were empty school-based locations or located near special education classrooms, such as a hallway outside of a special education classroom or a conference room. The only research team to conduct part of their study in a general education classroom was Heinrich, Collins, Knight, and Spriggs (2016).

Interventionists

Researchers served as the primary interventionists for 13 of the included studies. Doctoral students or graduate assistants were the interventionists for four studies. Special education teachers were the interventionists for 13 studies. Paraprofessionals were the interventionists for four studies.

Interventions

Research teams in this review used a variety of interventions to teach students with ID mathematics concepts and skills including: (a) prompting, (b) instructional approaches, (c) manipulatives, (d) technology, (e) and concept-specific strategies.

Prompting. Twelve studies incorporated prompting as their primary intervention or as part of an intervention package. Prompting interventions included simultaneous prompting procedure (SPP), constant time delay (CTD), audio and video prompting, and picture prompts. Research teams most frequently used SPP, with five studies

utilizing SPP to teach mathematics to secondary students with ID. SPP provides explicit instruction, drill and practice, and frequent corrective feedback. When using SPP, a teacher delivers target stimuli and controlling prompts simultaneously so the student does not have enough time to respond independently, therefore allowing the student to learn the task without errors (Rao & Kane, 2009).

Instructional approaches. Thirteen research teams used instructional approaches to teach secondary students with ID mathematical concepts and skills. A common theme in instructional approaches was the use of varying forms of concrete materials, such as manipulatives. Four teams used the concrete-representational-abstract (CRA) approach or adaptations of the CRA approach. The CRA approach first involves the use of concrete materials that develop into representational and eventually abstract thought (Witzel, Mercer, & Miller, 2003). Adaptations to this approach included virtual-representational-abstract, virtual-abstract, and concrete-semiconcrete-abstract approaches.

Another frequently used instructional approach was modified schema-based instruction (MSBI), which was employed by five research teams. MSBI involves: (a) developing problems and providing interactive read alouds of mathematics story problems; (b) mapping the story grammar with graphic organizers and manipulatives; (c) calculating the solution by applying steps of a task analysis; and (4) generalizing the problem solving to real life activities, technology, and peer tutors (Spooner et al., 2017).

Manipulatives. In addition to the manipulatives incorporated by research teams using instructional approaches, six other studies featured manipulatives as an

intervention or as part of an intervention package. Manipulatives included concrete, app-based, and virtual manipulatives. Types of manipulatives included base 10 blocks, number lines, and fraction tiles.

Technology. Technological interventions (other than virtual manipulatives) included video modeling, TouchMath, and the FLY Pen. Video modeling interventions included point-of-view video modeling and video self-modeling. In point-of-view video modeling, a video is recorded of a target skill with step-by-step explanations from first person perspective and the video is concentrated on the skill or task being explained (Allen, Wallace, Greene, Bowen, & Burke, 2010; Yakubova, Hughes, & Hornberger, 2015). When video self-modeling is applied, an individual observes themselves accurately and independently performing a target behavior (Dowrick, 1999). Two studies used TouchMath, a multi-sensory system involving dot notation to assist students with basic counting and computation skills (Waters & Boon, 2011). Bouck, Bassette, Taber-Doughty, Flanagan, and Szwed (2009) implemented the use of a FLY Pen. A FLY pen provides auditory output and prompts users to complete a variety of tasks.

Concept-specific strategies. Two research teams used strategies specific to teaching a particular mathematics concept or skill as their primary intervention. McCallum and Schmitt (2011) evaluated the effects of the taped problems intervention on division fact fluency of an eighth-grade student with ID. Taped problems specifically targets mathematics fact fluency and involves listening to audio recordings of the facts, followed by a short pause, and then listening to answers of the facts (McCallum & Schmitt, 2011). Cihak and Grim (2008) used counting-on and next-dollar strategies to enhance purchasing skills of high school

students with ID. When using the next-dollar strategy, students make purchases using one more dollar than asked by the salesperson (Test, Howell, Burkhart, & Beroth, 1993).

Mathematics Concepts and Skills

Research teams in this review taught a diversity of mathematics concepts and skills to secondary students with ID. Three main areas emerged: (a) functional skills, (b) basic mathematics skills, and (c) grade level standards-aligned concepts.

Functional skills. Eleven studies applied interventions for teaching functional mathematics skills to secondary students with ID. Functional mathematics skills related to living, working, participating, and accessing services in everyday life are important for students with disabilities (Bouck, Park, & Nickell, 2017; Burton et al., 2013). All functional mathematics skills were related to money. These skills included change-making, price comparison, comparing quantities, purchasing skills, tracking expenses, percent of change word problems, and 3-digit money problems with regrouping.

Basic mathematics skills. Basic mathematics skills addressed by research teams included computation-based skills and number comparison. Four research teams conducted studies targeting students' acquisition of basic mathematics facts. Two studies targeted computation-based skills other than basic mathematics facts. Bouck, Chamberlain, et al.'s (2017) study used concrete and app-based manipulatives to teach students with ID how to solve word problems involving subtraction with regrouping. Weng and Bouck (2016) taught number comparison using a paper-based number line and a number line app.

Grade level standards-aligned concepts. Seventeen research teams applied

interventions to teach grade level standards-aligned mathematics concepts and skills to secondary students with ID. The concepts and skills taught by these research teams fell within three main conceptual themes: (a) algebraic equations, (b) fractions and decimals, and (c) geometry. Solving algebraic equations was a targeted mathematics concept for seven research teams. These teams used task-analytic instruction to break down the steps required for students to solve algebraic equations. Five studies targeted acquisition of mathematics concepts and skills involving fractions and decimals, including adding fractions with unlike denominators, subtracting mixed fractions with unlike denominators in the context of word problems, equivalent fractions, and subtracting decimals with regrouping. Five research teams conducted studies targeting mathematics skills aligned to grade level geometry concepts and skills. These concepts and skills included identifying geometric figures, calculating the area and volume of geometric figures, applying the Pythagorean theorem, and identifying a geometric figure formed from line segments on a coordinate plane.

Discussion

An analysis of existing literature on interventions for teaching mathematics to secondary students with ID highlights significant implications for providing mathematics instruction to this population. This analysis also revealed the variety of interventions used to teach numerous mathematics concepts and skills to secondary students with ID. Despite the variety of settings used by research teams in this review, Heinrich et al. (2016) was the only research team to conduct part of their study in the general education setting. To facilitate greater access to the general education curriculum and setting for students with ID, an emphasis must be placed on evaluating the

effects of interventions for teaching mathematics to secondary students with ID in general education settings. Additionally, future research should also place an emphasis on the use of classroom teachers, both general and special education teachers, as interventionists. Increasing the number of teachers used as interventionists in research studies will provide greater insight on the feasibility of implementation of interventions for teaching mathematics to students with ID in authentic educational settings.

Merging Functional Skills with Grade Level Content

Results of this review showed secondary students with ID were capable of learning an array of functional, basic, and grade level standards-aligned mathematical concepts and skills. Concepts and skills ranged from change-making to basic multiplication facts to the Pythagorean theorem. An analysis of the targeted mathematics concepts and skills revealed a trichotomous approach of teaching mathematics to this population. Research teams targeted functional, basic, or grade level standards-aligned mathematics concepts or skills. Some research teams in this review attempted to embed functional activities within standards-aligned concepts, however most research teams fell short. Saunders and Thompson (2012) asserted

Grade-aligned skills, early numeracy skills, communication skills, and functional skills do not need to be thought of as separate entities, but rather, careful consideration should be made out of how multiple skills can be addressed within the same lesson to make the most of the time with the student (p. 17).

To provide meaningful mathematics learning experiences with real-life applications to secondary students with ID, researchers and educators should find ways to incorporate early numeracy and functional skills into

instruction targeting grade level standards-aligned concepts and skills.

Suggestions for Future Research

Most interventions used by research teams in this review are generalizable to other content areas, which increases potential for identifying these interventions as evidence-based practices (EBPs) for students with ID. Research teams frequently used prompting-based interventions, both as a primary intervention and as parts of multicomponent interventions. SPP was the most commonly used prompting procedure. According to Browder et al.'s (2008) meta-analysis results, SPP is a recommended procedure for teaching mathematics to students with significant cognitive disabilities. The five research teams in this review who applied SPP yielded positive results. All participants provided with SPP demonstrated increased proficiency in the targeted mathematics skills from baseline to intervention (see Table 1). Heinrich et al.'s (2016) results suggested SPP could be used to facilitate inclusion of students with ID in general education classes. Creech-Galloway, Collins, Knight, & Bausch's (2013) results showed students with ID provided with SPP are capable of learning advanced mathematics concepts and skills, such as the Pythagorean theorem. Generalization data from Rao and Kane's (2009) study indicated SPP helped participants learn skills in other content areas. However, although SPP is a recommended practice and has generated positive results for students with ID, additional research is needed to warrant SPP and other prompting procedures as EBPs for secondary students with ID utilizing new sets of EBP standards (Council for Exceptional Children, 2014; Kratochwill et al., 2010).

Courtade, Test, and Cook (2014) applied Horner et al.'s (2005) EBP standards for single-case design and found CTD was an

EBP for teaching academics to students with moderate to severe ID. However, despite this designation as an EBP, only two research teams (Collins, Hager, & Creech-Galloway, 2011; Weng & Bouck, 2016) in this review used CTD to teach mathematics to secondary students with ID. An analysis of these studies found both teams failed to discuss CTD's efficacy on participants' understanding of mathematical concepts. This limited discussion of CTD's effect on mathematical understanding showed CTD is generally an embedded intervention procedure, rather than a primary intervention. Researchers need to conduct additional studies applying CTD as a primary intervention to further establish CTD as an EBP for teaching mathematics and other academic content areas to secondary students with ID under new sets of EBP standards.

Research teams in this review also frequently used forms of concrete materials or manipulatives to teach mathematics concepts to secondary students with ID. According to Jimenez et al. (2008), manipulatives gave their algebra lesson a meaningful context for students, as it was similar to other job tasks students had performed. Baker et al. (2015) found using hybrid models of concrete and semiconcrete representations, such as manipulatives and graphic organizers, was beneficial for teaching secondary students with ID advanced mathematical concepts, such as algebra. The CRA approach or offshoots of this approach were also used to teach mathematics to secondary students with ID. All participants, with the exception of one participant with variable data from Bouck, Park, Sprick et al.'s (2017) study indicated clear trends of improvement in response to CRA-based approaches (see Table 1). Future research and EBP reviews are needed to determine if CRA-based approaches, as well as manipulatives, are EBPs for teaching mathematics concepts to students with ID. In

addition, as students with ID are increasingly exposed to virtual manipulatives, additional research is needed to determine the efficacy of these interventions with this population.

Task analyses also emerged as a common intervention and dependent variable measure. This aligns with Courtade et al.'s (2014) findings, which indicated systematic instruction is an EBP for teaching mathematics to students with ID according to Horner et al.'s (2005) EBP standards. As evidenced by study outcomes in this review, incorporating task analyses as part of systematic instruction benefitted secondary students with ID when learning basic, functional, and grade-aligned mathematics concepts and skills (see Table 1). Researchers should continue to incorporate task analyses as interventions and dependent variable measures. Commonly used instructional approaches which incorporate task analyses, such as MSBI, should be evaluated under new sets of EBP standards as well. All participants in this review exposed to MSBI significantly increased their ability to solve word problems related to targeted mathematics concepts such as personal finance, algebra, addition, subtraction, and percent of change (see Table 1). Many components of MSBI, including interactive read alouds, graphic organizers, manipulatives, task analyses, and generalization were also evident within earlier studies (Baker, Rivera, Morgan, & Reese, 2015; Browder, Trela, et al., 2012; Browder, Jimenez, & Trela, 2012; Jimenez, Browder, & Courtade, 2008). This demonstrated how MSBI has built upon previous research related to mathematics instruction for students with ID. Researchers can support replication of their studies involving task analyses by sharing figures of exact task analyses used in their studies. This will allow researchers to easier replicate studies and can further promote identification

of task analyses and instructional approaches incorporating task analyses such as MSBI as EBPs under new sets of EBP standards.

Limitations

Although this review contained extensive information regarding interventions for teaching mathematics to secondary students with ID, it was limited to an analysis and discussion of existing literature on this topic. Future reviews should build on this review by including statistical analyses on the efficacy of interventions for teaching mathematics to secondary students with ID. A meta-analysis on this topic may provide greater insight for researchers and educational practitioners on the effects of specific interventions on teaching mathematics to secondary students with ID. In addition, interventions in this review should also be evaluated under new sets of EBP standards to determine if any of these practices are EBPs for secondary students with ID.

Conclusion

This systematic literature review examined existing literature on interventions for

teaching mathematics to secondary students with ID. Research teams have used a diversity of interventions to teach secondary students with ID various mathematics concepts and skills. Frequently used practices, such as prompting procedures, manipulatives, and instructional approaches such as the CRA approach and MSBI should be assessed using updated EBP standards to determine if any of these interventions are EBPs for students with ID. Identifying practices as evidence-based may result in more effective mathematics instruction for secondary students with ID. In addition, most research teams taught secondary students with ID functional skills, basic mathematics skills, or grade level standards-aligned concepts. However, functional activities and basic mathematics skills were rarely embedded within instruction targeting grade level standards-aligned concepts. Moving forward, additional research is needed to examine mathematics instruction for secondary students with ID aligned to grade level standards with functional content embedded.

References

- Allen, K. D., Wallace, D. P., Greene, D. J., Bowen, S. L., & Burke, R. V. (2010). Community-based vocational instruction using videotaped modeling for young adults with autism spectrum disorders performing in air-inflated mascots. *Focus on Autism and Other Developmental Disabilities*, 25, 186–192. doi: 10.1177/1088357610377318
- American Association on Intellectual and Developmental Disabilities. (2018). Definition of intellectual disability. Retrieved from <http://aaid.org/intellectual-disability/definition>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, D.C.: American Psychiatric Association.
- *Baker, J. N., Rivera, C. J., Morgan, J. J., & Reese, N. (2015). Teaching algebraic equations to middle school students with intellectual disabilities. *Journal of the American Academy of Special Education Professionals*, Spring/Summer, 29–43.
- Boat, T. F., & Wu, J. T. (Eds.). (2015). Clinical characteristics of intellectual disabilities. In *Mental disorders and disabilities among low-income children* (pp. 169–178). Washington, D.C.: The National Academies Press.
- *Bouck, E. C., Bassette, L., Shurr, J., Park, J., Kerr, J., & Whorley, A. (2017). Teaching equivalent fractions to secondary students with disabilities via the virtual-representational-

- abstract instructional sequence. *Journal of Special Education Technology*, 32, 220–231. doi: 10.1177/0162643417727291
- *Bouck, E. C., Bassette, L., Taber-Doughty, T., Flanagan, S. M., & Szwed, K. (2009). Pentop computers as tools for teaching multiplication to students with mild intellectual disabilities. *Education and Training in Developmental Disabilities*, 44, 367–380.
- *Bouck, E. C., Chamberlain, C., & Park, J. (2017). Concrete and app-based manipulatives to support students with disabilities with subtraction. *Education and Training in Autism and Developmental Disabilities*, 52, 317–331.
- *Bouck, E. C., Park, J., & Nickell, B. (2017). Using the concrete-representational-abstract approach to support students with intellectual disability to solve change-making problems. *Research in Developmental Disabilities*, 60, 24–36. doi: 10.1016/j.ridd.2016.11.006
- *Bouck, E. C., Park, J., Sprick, J., Shurr, J., Bassette, L., & Whorley, A. (2017). Using the virtual-abstract instructional sequence to teach addition of fractions. *Research in Developmental Disabilities*, 70, 163–174. doi: 10.1016/j.ridd.2017.09.002
- *Bouck, E. C., Satsangi, R., & Bartlett, W. (2016). Comparing a number line and audio prompts in supporting price comparison by students with intellectual disability. *Research in Developmental Disabilities*, 53–54, 342–357. doi: 10.1016/j.ridd.2016.02.011
- *Bouck, E. C., Shurr, J., Bassette, L., Park, J., & Whorley, A. (2018). Adding it up: Comparing concrete and app-based manipulatives to support students with disabilities with adding fractions. *Journal of Special Education Technology*, 33, 194–206. doi: 10.1177/0162643418759341
- Bowman, J. A., McDonnell, J., Ryan, J. H., & Fudge-coleman, O. (2019). Effective mathematics instruction for students with moderate and severe disabilities: A review of the literature. *Focus on Autism and Other Developmental Disabilities*. doi: 10.1177/1088357619827932
- *Browder, D. M., Jimenez, B. A., & Trela, K. (2012). Grade-aligned math instruction for secondary students with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities*, 47, 373–388.
- Browder, D. M., Spooner, F., Ahlgrim-Delzell, L., Harris, A. A., & Wakeman, S. (2008). A meta-analysis on teaching mathematics to students with significant cognitive disabilities. *Exceptional Children*, 74, 407–432. doi: 10.1177/001440290807400401
- *Browder, D. M., Spooner, F., Lo, Y., Saunders, A. F., Root, J. R., Davis, L. L., & Brosh, C. R. (2018). Teaching students with moderate intellectual disability to solve word problems. *The Journal of Special Education*, 51, 222–235. doi: 10.1177/0022466917721236
- *Browder, D. M., Trela, K., Courtade, G. R., Jimenez, B. A., Knight, V., & Flowers, C. (2012). Teaching mathematics and science standards to students with moderate and severe developmental disabilities. *The Journal of Special Education*, 46, 26–35. doi: 10.1177/0022466910369942
- *Burton, C. E., Anderson, D. H., Prater, M. A., & Dyches, T. T. (2013). Video self-modeling on an iPad to teach functional math skills to adolescents with autism and intellectual disability. *Focus on Autism and Other Developmental Disabilities*, 28, 67–77. doi: 10.1177/1088357613478829
- *Cihak, D. F., & Grim, J. (2008). Teaching students with autism spectrum disorder and moderate intellectual disabilities to use counting-on strategies to enhance independent purchasing skills. *Research in Autism Spectrum Disorders*, 2, 716–727. doi: 10.1016/j.rasd.2008.02.006
- *Collins, B. C., Hager, K. L., & Creech-Galloway, C. (2011). Addition of functional content during core content instruction with students with moderate disabilities. *Education and*

- Training in Autism and Developmental Disabilities*, 46, 22–39.
- Common Core State Standards Initiative. (2017). Standards in your state. Retrieved from <http://www.corestandards.org/standards-in-your-state/>
- Council for Exceptional Children. (2014). *Council for Exceptional Children standards for evidence-based practices in special education*. Retrieved from <https://www.cec.sped.org/~media/Files/Standards/Evidence%20based%20Practices%20and%20Practice/EBP%20FINAL.pdf>
- Courtade, G. R., Test, D. W., & Cook, B. G. (2014). Evidence-based practices for learners with severe intellectual disability. *Research and Practice for Persons with Severe Disabilities*, 39, 305–318. doi.org/10.1177/1540796914566711
- *Creech-Galloway, C., Collins, B. C., Knight, V., & Bausch, M. (2013). Using a simultaneous prompting procedure with an iPad to teach the pythagorean theorem to adolescents with moderate intellectual disability. *Research and Practice for Persons With Severe Disabilities*, 38, 222–232. doi: 10.1177/154079691303800402
- Dowrick, P. W. (1999). A review of self modeling and related interventions. *Applied and Preventive Psychology*, 8, 23–39. doi: 10.1016/S0962-1849(99)80009-2
- *Fletcher, D., Boon, R. T., & Cihak, D. F. (2010). Effects of the TouchMath program compared to a number line strategy to teach addition facts to middle school students with moderate intellectual disabilities. *Education and Training in Autism and Developmental Disabilities*, 45, 449–458.
- *Heinrich, S., Collins, B. C., Knight, V. F., & Spriggs, A. D. (2016). Embedded simultaneous prompting procedure to teach STEM content to high school students with moderate disabilities in an inclusive setting. *Education and Training in Autism and Developmental Disabilities*, 51, 41–54.
- Hord, C., & Bouck, E. C. (2012). Review of academic mathematics instruction for students with mild intellectual disability. *Education and Training in Autism and Developmental Disabilities*, 47, 389–400.
- *Hord, C., & Xin, Y. P. (2015). Teaching area and volume to students with mild intellectual disability. *The Journal of Special Education*, 49, 118–128. doi: 10.1177/0022466914527826
- 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, 165–179. doi: 10.1177/001440290507100203
- Hudson, M. E., Rivera, C. J., & Grady, M. M. (2018). Research on mathematics instruction with students with significant cognitive disabilities: Has anything changed? *Research and Practice for Persons with Severe Disabilities*, 43, 38–53. doi: 10.1177/1540796918756601
- Individuals with Disabilities Education Improvement Act of 2004, 20 U.S.C. § 1400 *et seq.*
- *Jimenez, B. A., Browder, D. M., & Courtade, G. R. (2008). Teaching an algebraic equation to high school students with moderate developmental disabilities. *Education and Training in Developmental Disabilities*, 43, 266–274.
- Jimenez, B. A., & Stanger, C. (2017). Math manipulatives for students with severe intellectual disability: A survey of special education teachers. *Physical Disabilities: Education and Related Services*, 36, 1–12. doi: 10.14434/pders.v36i1.22172
- *Karl, J., Collins, B. C., Hager, K. D., & Ault, M. J. (2013). Teaching core content embedded in a functional activity to students with moderate intellectual disability using a simultaneous prompting procedure. *Education and Training in Autism and Developmental Disabilities*, 48, 363–378.

- Kearns, J. F., Towles-Reeves, E., Kleinert, H. L., Kleinert, J. O., & Thomas, M. K.-K. (2011). Characteristics of and implications for students participating in alternate assessments based on alternate academic achievement standards. *The Journal of Special Education, 45*, 3–14. doi: 10.1177/0022466909344223
- Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). *Single-case designs technical documentation*. Retrieved from http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf
- *McCallum, E., & Schmitt, A. J. (2011). The taped problems intervention: Increasing the math fact fluency of a student with an intellectual disability. *International Journal of Special Education, 26*, 276–284.
- Polloway, E. A., Patton, J. R., & Nelson, M. A. (2011). Intellectual and developmental disabilities. In J. M. Kauffman & D. P. Hallahan (Eds.), *Handbook of special education* (pp. 175–186). New York, NY: Routledge.
- Prendergast, M., Spassiani, N. A., & Roche, J. (2017). Developing a mathematics module for students with intellectual disability in higher education. *International Journal of Higher Education, 6*, 169. doi: 10.5430/ijhe.v6n3p169
- *Rao, S., & Kane, M. T. (2009). Teaching students with cognitive impairment chained mathematical task of decimal subtraction using simultaneous prompting. *Education and Training in Developmental Disabilities, 44*, 244–256.
- *Rao, S., & Mallow, L. (2009). Using simultaneous prompting procedure to promote recall of multiplication facts by middle school students with cognitive impairment. *Education and Training in Developmental Disabilities, 44*, 80–90.
- *Root, J. R., & Browder, D. M. (2017). Algebraic problem solving for middle school students with autism and intellectual disability. *Exceptionality*. doi: 10.1080/09362835.2017.1394304
- *Root, J. R., Cox, S. K., Hammons, N., Saunders, A. F., & Gilley, D. (2018). Contextualizing mathematics: Teaching problem solving to secondary students with intellectual and developmental disabilities. *Intellectual and Developmental Disabilities, 56*, 442–457. doi: 10.1352/1934-9556-56.6.442
- *Root, J. R., Henning, B., & Boccumini, E. (2018). Teaching students with autism and intellectual disability to solve algebraic word problems. *Education and Training in Autism and Developmental Disabilities, 53*, 325–338.
- *Root, J., Saunders, A., Spooner, F., & Brosh, C. (2017). Teaching personal finance mathematical problem solving to individuals with moderate intellectual disability. *Career Development and Transition for Exceptional Individuals, 40*, 5–14. doi: 10.1177/2165143416681288
- *Rowe, D. A., Cease-Cook, J., & Test, D. W. (2011). Effects of simulation training on making purchases with a debit card and tracking expenses. *Career Development for Exceptional Individuals, 34*, 107–114. doi: 10.1177/0885728810395744
- Sarama, J., & Clements, D. H. (2009). *Early childhood mathematics education research: Learning trajectories for young children*. New York, NY: Routledge.
- Saunders, A. F., Bethune, K. S., Spooner, F., & Browder, D. (2013). Solving the Common Core equation. *Teaching Exceptional Children, 45*, 24–33.
- *Saunders, A. F., Spooner, F., & Davis, L. L. (2018). Using video prompting to teach mathematical problem solving of real-world video-simulation problems. *Remedial and Special Education, 39*, 53–64. doi: 10.1177/0741932517717042

- Saunders, A., & Thompson, J. L. (2012). CCSS: Mathematics. *TASH Connections, Fall*, 13–19.
- Spooner, F., Saunders, A., Root, J., & Brosh, C. (2017). Promoting access to Common Core mathematics for students with severe disabilities through mathematical problem solving. *Research and Practice for Persons with Severe Disabilities, 42*, 171–186. doi: 10.1177/1540796917697119
- Test, D. W., Howell, A., Burkhart, K., & Beroth, T. (1993). The one-more-than technique as a strategy for counting money for individuals with moderate mental retardation. *Education and Training in Mental Retardation, 1*, 232–241.
- U.S. Department of Education. (2017). *Number of students ages 6 through 21 served under IDEA, Part B, by educational environment and state: 2016-17*. Retrieved from <https://www2.ed.gov/programs/osepidea/618-data/static-tables/index.html>
- Wakeman, S. Y., Karvonen, M., & Ahumada, A. (2013). Changing instruction to increase achievement for students with moderate to severe intellectual disabilities. *Teaching Exceptional Children, 46*, Nov/Dec, 6–13. doi: 10.1177/004005991304600201
- *Waters, H. E., & Boon, R. T. (2011). Teaching money computation skills to high school students with mild intellectual disabilities via the TouchMath© Program: A multi-sensory approach. *Education and Training in Autism and Developmental Disabilities, 46*, 544–555.
- *Weng, P., & Bouck, E. C. (2018). Comparing the effectiveness of two app-based number lines to teach price comparison to students with autism spectrum disorders. *Disability and Rehabilitation: Assistive Technology*. doi: 10.1080/17483107.2018.1430869
- *Weng, P., & Bouck, E. C. (2014). Using video prompting via iPads to teach price comparison to adolescents with autism. *Research in Autism Spectrum Disorders, 8*, 1405–1415. doi: 10.1016/j.rasd.2014.06.014
- *Weng, P., & Bouck, E. C. (2016). An evaluation of app-based and paper-based number lines for teaching number comparison. *Education and Training in Autism and Developmental Disabilities, 51*, 27–40.
- Witzel, B. S., Mercer, C. D., & Miller, M. D. (2003). Teaching algebra to students with learning difficulties: An investigation of an explicit instruction model. *Learning Disabilities Research & Practice, 18*, 121–131. doi: 10.1111/1540-5826.00068
- *Yakubova, G., Hughes, E. M., & Hornberger, E. (2015). Video-based intervention in teaching fraction problem-solving to students with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 45*, 2865–2875. doi: 10.1007/s10803-015-2449-y

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“I Have Autism”: A Review of the Literature on Sharing Diagnosis with Peers

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Abstract: Despite inclusion efforts and increased physical proximity in general education classes, research continues to document the high prevalence of bullying victimization, as well as low levels of reciprocity, quality, and quantity of friendships among students with autism spectrum disorder (ASD). Defining characteristics of ASD (e.g., lack of eye contact) may confuse peers, making it more difficult for students with ASD to develop and maintain positive peer relationships. Some have posited that by explaining an autism diagnosis to peers, peers will assert agency of atypical behaviors to ASD symptoms, rather than the individual student. In this article we synthesize the literature on how individuals with ASD have disclosed diagnosis related information to their peers and how their peers responded. We conclude with directions for future research.

Since the inception of federal special education policy (Education for All Handicapped Children Act, 1975; Individuals with Disabilities Education Improvement Act [IDEA], 2004), individuals with disabilities have a right to specialized instruction aligned with their needs. Such instruction includes high expectations for progress and—to the greatest extent possible—access to the general education curriculum, extracurricular, and nonacademic activities (*Endrew F. v. Douglas County School District*, 2017). More than just access, having a sense of school belonging in regular educational settings includes having feelings of trust, worth, and acceptance in authentic school settings (Hamm & Faircloth, 2005). Sense of belonging, peer acceptance, and friendship are examples of academic enablers associated with success within and beyond the classroom walls. Peer acceptance, ultimately leading to friendship, is an important goal and outcome of inclusive education.

Access to general education for students with autism spectrum disorder (ASD) is supported by federal special education law (e.g., IDEA, 2004). Consistent access to general education offers students with and without ASD opportunities to see each other in order to build opportunities for peer acceptance, a sense of belonging, and friendship (Carter et al., 2014). In the most recent report to Congress, more than 90% of students with ASD who are served under Part B of IDEA spend some portion of their regular school day in inclusive environments: 63.1% ($\geq 80\%$ or more of hours), 18.0% (40-79%), and 33.4% ($< 40\%$) of students respectively (U.S. Department of Education, 2018). Inclusion is particularly well-situated to support social goals as inclusion is thought to (a) reduce stigma perpetuated by segregated education placement for students with disabilities, (b) benefit students with disabilities by fostering social learning of appropriate social behaviors exhibited by typical peers, and (c) promote social acceptance and improving the social status of children with disabilities (Frederickson, 2010). As such, there is a

range of opportunities throughout the school day that can foster more meaningful interactions and relationships between students with ASD and typically developing peers. Interventions, strategies, and programs to support these efforts include: (a) student-focused interventions (e.g., social skills training), (b) peer-education or peer-focused interventions (e.g., peer-mediated supports), (c) teacher/professional supports (e.g., paraprofessional, close proximity), and (d) school-wide supports (e.g., disability awareness training); see Carter et al. (2014) and Chan et al. (2009) for a review.

Despite these efforts, challenges continue for youth with ASD related to peer acceptance, fostering friendships, stigmatization, and bullying. Research indicates youth with ASD have fewer friends, engage in less contact with peers outside of school, have shorter duration of friendships, and have fewer reciprocal friendships compared to their typically developing peers (Petrina, Carter, & Stephenson, 2014). They are also involved in the bullying dynamic at high rates (e.g., Little, 2002) and more frequently involved as victims (Zablotsky, Bradshaw, Anderson, & Law, 2013). Limited friendships and frequent bullying victimization are concerning given the negative academic and behavioral outcomes associated with peer rejection (Wentzel, Donlan, & Morrison, 2012). Research indicates students who are rejected by their peers experience academic difficulties, and when compared to average status peers, they are less compliant, and more aggressive and withdrawn (Wentzel et al., 2012). Although social challenges are a defining feature of ASD (American Psychiatric Association [APA], 2013), the presence of ASD in no way diminishes the impact of positive relationships on success in school and beyond the classroom. For example, Lasgaard, Nielsen, Eriksen, and Goosens (2010) found students with ASD

who reported a high degree of loneliness reported low social support.

The (In)visibility of Autism

The earliest characteristics used to describe and classify ASD (what was then called *infantile autism*) included a normal physical appearance (Kanner, 1943). That is, unlike other neurodevelopmental disabilities that include physical attributes (e.g., Down's syndrome), ASD has no "outward appearance." Additional characteristics of ASD include challenges in social communication and social interaction, and the presence of narrow, restricted behaviors, interests, or activities (APA, 2013)—that is all behaviors that need to be observed and then inferred in context. To date, many students with ASD, even when educated in inclusive environments, are often bullied and ostracized by peers (Sreckovic, Brunsting, & Able, 2014), which may be due to their atypical social interactions and behaviors (Heinrichs, 2003). Parents of children with ASD have reported stigmatization due to the social inappropriateness of their children's behavior (Gray, 2002). Because ASD is an "invisible" disability, describing to peers why students with ASD may engage in atypical behaviors may help expand understanding and acceptance. Throughout this paper, the process of sharing a diagnosis with peers is referred to as *diagnosis disclosure*. Disclose means to make known (Merriam-Webster, 2019), thus disclosure refers to the actions of making new, secret, or hidden information known.

Disclosure

Whether to *disclose* that a child has autism to school professionals and classmates is a deeply personal decision for students and families (e.g., Lisser & Westbay, 2001). Advocates of disclosure posit it may lead to improved communication between families and school professionals, as well as peer

relationships; whereas opponents have raised concerns that disclosure may increase stigmatization responses from faculty, staff, and students (Campbell, 2006). Advocates of disclosure frequently draw on attributional theory to promote explanatory messages to provide peers with accurate information about autism and correct misattributions of student's behavior (Campbell, 2006).

Attributional theory explores how individuals interpret events (e.g., social approval, social rejection) in ways that ascribe internal and external causes to explain the behavior of others (Weiner, 1974). Attributing behavior of others is a three-stage process involving (a) observing the behavior, (b) determining if the behavior is deliberate, and (c) attributing internal and/or external causes. Related to disability, the relationship between visibility and social approval exist on continuums of visibility and coping strategies (Hay, 2010). For instance, an individual with visible symptoms or characteristics with strong coping strategies in place is viewed as a *hero*, whereas an individual with invisible symptoms/characteristics may be viewed as *normal*. Conversely, an individual in need of additional coping strategies with visible symptoms/characteristics may be viewed with *pity* and someone with invisible symptoms/characteristics may be viewed as *lazy* (Hay, 2010). The fundamental error in attribution is the tendency to emphasize other people's internal characteristics (e.g., character or intention), rather than external factors (e.g., circumstance and context) in explaining their behavior (Yudkowsky, 2015).

Historical and contemporary accounts suggest that ASD is an invisible disability. As such, it may not be obvious by physical appearance alone that an individual has ASD and that attributes will be taken into account

that do not include the unique constellation of behaviors and characteristics associated with having ASD (APA, 2013). For instance, a classmate may be confused when a peer with ASD demonstrates unexpected, atypical behavior. The student may internalize (e.g., the student does not play nicely because he is mean) rather than externalize (e.g., the student is still learning how to take turns) the unexpected behavior in error. Some posit if a student discloses their diagnosis to peers, peers will assert responsibility of atypical behavior to ASD rather than to the individual person and peers will be more likely to have positive attitudes and behavioral intentions toward the student with ASD (Campbell, Ferguson, Herzinger, Jackson, & Marino, 2004). Through the provision of explanatory information, incorrect knowledge about the behavior or disability can be corrected and will hopefully prevent social rejection and promote peer acceptance and notions of inclusion. Research documents that while some students have heard of ASD, few are able to produce an acceptable definition (Swaim & Morgan, 2001). The limited knowledge peers have of ASD coupled with limited documentation on how students are exposed to ASD is surprising given the critical importance of peer relations as an enabler of school success (Campbell & Barger, 2010) and the continued documentation of social challenges students with ASD experience (Winchell, Sreckovic, & Schultz, 2018). To better understand how student disclosure of having ASD supports student sense of belonging and peer relations, more research is needed to understand how students with ASD disclose their diagnosis and how peers respond.

Purpose

The purpose of this review is to synthesize empirical research examining the impact of sharing an autism diagnosis with peers. More specifically, we highlight studies that include

individuals with ASD who disclose their diagnosis, how they disclose their diagnosis, and peer responses when they disclose their diagnosis. This information is synthesized to provide guidance to practitioners, families, and individuals with ASD who may be considering sharing diagnosis information and to provide researchers with future directions for research in this area.

Article Selection

The authors conducted an electronic search in psychology/sociology databases to find relevant literature. Using the keywords “autism or Asperger*” and “peer” and “perceptions or attitude or opinion or belief” 123 articles were identified. Backward ancestral searches were also conducted, and three additional articles were identified. Articles were included in the synthesis if they (a) included sharing the diagnosis of an individual with ASD; (b) the diagnosis was shared with peers; (c) results reported impact on peers; (d) the article was published in a peer-reviewed journal; and (e) the article was written in English. Ten studies met the inclusion criteria and are synthesized below.

Synthesis

Three types of research studies examining diagnosis disclosure were identified in the literature: survey, ethnography, and case study. Eight of the ten studies used fictitious characters with ASD as the focal person in which diagnosis related information was shared to peers. The fictitious character was an actor portraying characteristics similar to a person with ASD. Surveys were then administered to peers inquiring about peer attitudes and intentions related to engaging with the individual with ASD academically and/or socially (Campbell, 2007; Campbell et al., 2004; Campbell, Ferguson, Herzinger, Jackson, & Marino; 2005; Dachez & Ndobu, 2018; Matthews, Ly, & Goldberg, 2015; Morton & Campbell, 2008; Siltan & Fogel,

2012; Swaim & Morgan, 2001). One study used ethnography as a means to examine the lived experiences of elementary aged students who did and did not share their diagnosis with their peers and/or teacher and impact on positive inclusive practices, including relationships with peers (Ochs, Kremer-Sadlik, Solomon, & Sirota, 2001). One study used case study methodology to examine the successful inclusion experiences of a kindergarten student with ASD, in which one component was getting to know the abilities and special needs of the child (Bennett, Rowe, & DeLuca, 1996). Table 1 displays the study design of each article.

Surveys

The eight studies that employed surveys varied in the format through which diagnosis information was shared (video, written vignette), who delivered the information (the individual with ASD, teacher, parent, doctor, mother, father), and what information was shared with peers (descriptive information, explanatory information, directive information, peer support strategies, student strengths). Table 2 provides descriptive information about the studies.

Five studies used video vignettes to examine the impact of content of information provided to peers on peers’ behavioral and/or cognitive attitudes (Campbell, 2007; Campbell et al., 2004, 2005; Siltan & Fogel, 2012; Swaim & Morgan, 2001). Four studies examined if there was a difference in descriptive (i.e., description of similarities of peers and focal student) and explanatory (i.e., explanation of ASD) information on peers’ attitudes and/or intentions to engage in shared activities (Campbell, 2007, also examined difference on no information provided at all). Three studies found combined descriptive and explanatory information resulted in more positive peer attitudes (Campbell et al., 2004, Campbell, 2005; Campbell, 2007). Swaim

Table 1. *Study Design*

Article	Design	Student with ASD (Real or Fictitious)
Bennett, Rowe, & DeLuca (1996)	Case Study	Real
Ochs, Kremer-Sadlik, Solomon, & Sirota (2001)	Ethnography	Real
Swaim & Morgan (2001)	Survey	Fictitious
Campbell, Ferguson, Herzinger, Jackson, & Marino (2004)	Survey	Fictitious
Campbell, Ferguson, Herzinger, Jackson, & Marino (2005)	Survey	Fictitious
Campbell (2007)	Survey	Fictitious
Morton & Campbell (2008)	Survey	Fictitious
Silton & Fogel (2012)	Survey	Fictitious
Matthews, Ly, & Goldberg (2015)	Survey	Fictitious
Dachez & Ndobu (2018)	Survey	Fictitious

and Morgan (2001) found no difference between explanatory and descriptive information. Silton and Fogel (2012) examined impact on content but in addition to explanatory and descriptive information, provided information on focal student strengths and peer strategies. Results indicated participants who watched the video with descriptive, explanatory, and peer strategies and students who watched the video with descriptive, explanatory, peer strategies, and student strengths reported more positive behavioral intentions compared to just explanatory and descriptive information or descriptive, explanatory, and student strengths. Further, students who were provided with all four types of information (i.e., descriptive, explanatory, peer strategies, focal student strengths) reported more positive academic behavioral intentions than students who watched the video with just descriptive and explanatory information.

Morton and Campbell (2008) and Dachez and Ndobu (2018) examined the impact of information source on peers' attitudes. In Morton and Campbell (2008) all participants (296 third-, fourth-, and fifth-grade students) watched a videotaped vignette of an actor (i.e., Robby) portraying a person with ASD (this is the same video used in Campbell et al. 2004 and Swaim & Morgan, 2001). The videotape provided descriptive information about the actor. Students were randomly assigned to receive explanatory information from one of five sources: videotape, classroom teacher, actor portraying Robby's mother, actor portraying Robby's father, or actor portraying Robby's doctor. Results indicated source effected behavioral attitudes for fourth- and fifth-grade students, but not third-grade students. Fourth-graders reported more positive attitudes when teachers presented information versus doctors and fifth-graders reported more positive attitudes when a doctor, teacher, or videotape

Table 2. *Descriptive Results of Survey Studies*

Article	Participants	Measures	Disclosure Procedures	Results
Swaim & Morgan (2001)	116 males; 117 females 3 rd graders (mean age =9.12 years) and 6 th graders (mean age = 12.02 years) 93.6% White; 6.4% Black	ACL; SAQ-Self; SAQ-Other; SRF	Students viewed video vignette in 1 of 3 conditions: FS does not have ASD and D info is provided; FS does have ASD and D info is provided; and, FS does have ASD and D and E info is provided.	No differences found between conditions in relation to own preferences for shared activities with FS.
Campbell, Ferguson, Herzinger, Jackson, & Marino (2004)	294 males; 282 females 3 rd , 4 th , and 5 th graders (mean age = 10.06 years) 8.9% African-American; 80.6% Caucasian; 4.5% Hispanic/Latino; 0.7% Asian-American; 5.2% Other	ACL; SAQ; SRF	Same video vignette as Swaim & Morgan (2001). Students were randomly assigned to view 2 videotapes in 1 of 2 conditions: FS does not have ASD and FS has ASD plus D info is provided; FS does not have ASD and FS has ASD plus D and E info is provided.	Combined D and E info resulted in improved 3 rd and 4 th graders cognitive attitudes toward FS compared to D info alone. Across grades combined D and E info improved behavioral intentions to engage in shared activities with FS. Combined D and E info improved females' intentions more than males' to engage in shared academic activities with FS.
Campbell, Ferguson, Herzinger, Jackson, & Marino (2005)	294 males; 282 females 3 rd , 4 th , and 5 th graders (mean age = 10.06 years) 8.9% African-American; 80.6% Caucasian; 4.5% Hispanic/Latino; 0.7% Asian-American; 5.2% Other (same as Campbell et al., 2004)	ACL; SAQ; SRF; peer sociometric nominations	Same video vignette as Swaim & Morgan (2001). Students were randomly assigned to view 2 videotapes in 1 of 2 conditions: FS does not have ASD and FS has ASD; FS does not have ASD and FS has ASD plus E info is provided.	When E info was provided popular and rejected students rated FS more positively. Neglected students reported more negative attitudes toward FS versus typical student compared to average students and less willingness to engage in academic activities with FS compared to rejected students. Rejected students were more willing to engage in activities with FS when E info was provided compared to average and neglected students.

Campbell (2007)	<p>93 males; 140 females</p> <p>Middle school students (mean age = 13.07 years)</p> <p>45.1% African American; 32.6% European American; 5.6% Hispanic/Latino; 1.3% Asian American; 14.2 % Other</p>	KOA; ACL; SAQ; SRF; PRQ	<p>Viewed video of 14 year old FS with ASD; students were assigned to receive 1 of 4 info message conditions about student on a pamphlet written in 1st person: no info; D info only; E info only; D and E info.</p>	<p>Combined E and D info resulted in more favorable cognitive attitudes for students without prior knowledge of ASD.</p> <p>Combined E and D info resulted in increased perceived similarity and more positive social intentions.</p> <p>Students with prior knowledge reported more positive attitude and females reported more positive attitudes than males.</p>
Morton & Campbell (2008)	<p>155 males; 141 females</p> <p>Age: 8-12 (mean age = 10.21 years)</p> <p>9.8% African–American; 82.8% Caucasian; 4.4% Hispanic/Latino; 0.3% Asian–American; 2.3% Other</p>	ACL; SAQ-SF	<p>Video vignette of student with ASD (Same video as Swaim & Morgan, 2001); classrooms were randomly assigned to receive explanatory information from 1 of 5 sources (i.e., videotape; classroom teacher; mother; father; doctor).</p>	<p>No significant differences across sources for 3rd graders.</p> <p>4th graders reported greater willingness to engage in shared activities when teacher provided information versus doctor.</p> <p>5th graders reported greater willingness to engage in shared activities when videotape, teacher, or doctor provided information versus mother or father.</p>
Silton & Fogel (2012)	<p>82 males; 75 females; 1 child did not report gender</p> <p>4th, 5th, 6th graders (mean age = 10.39)</p> <p>All but one student was white</p>	Autism Knowledge Sheet; ACL; SAQ	<p>Students watched 1 of 4 video conditions: video 1 D and E info; video 2 D and E info plus peer strategies; video 3 D and E info plus strengths info; video 4 D, E, peer strategies, and strengths.</p>	<p>Students who watched video 2 and 4, with both including peer strategies, reported more positive behavioral intentions compared to those who watched 3.</p> <p>Students who viewed video 4, including peer strategies and strengths, reported more positive academic behavioral intentions than those who viewed video 1, D & E only.</p> <p>No significant differences across videos for cognitive attitudes.</p>

Matthews, Ly, & Goldberg (2015)	224 undergrad students (52% male, 48% female) (mean age = 20 years) 62% Asian American; 19% European American; 18 % Hispanic or Latino; 1% African American	BAPQ; MAS; AKQ	Students were randomly assigned to read 1 of 3 vignettes: HFA label; typical college student label; no label.	Students in HFA label condition reported more positive behavioral attitudes and cognitive attitudes toward peer in vignette with ASD compared to no label condition. Male students and students with lower ASD phenotype scores reported more positive attitudes.
Dachez & Ndobu (2018)	72 males; 32 females Engineering students in 3 rd , 4 th , or 5 th year of college (mean age = 21.8 years)	Socio-demographic questionnaire which included two questions on familiarity with ASD; MAS	Students were assigned to 1 of 3 conditions: group 1 watched a short video of FS with ASD interacting with peer; group 2 watched same video with voice over message providing D, E, and directive info; group 3 watched short video after which FS in video came out in person and provided info.	Participants in personalized interaction group (group 3) displayed more positive emotions, cognitions, and behaviors than participants in groups 1 and 2. No significant differences in attitudes between groups 1 and 2. More positive emotions and behavior reported at posttest and follow-up than pretest.

Note. FS = focal student; D info = descriptive information (i.e., information on similarities between FS and peers); E info = explanatory information (i.e., information about ASD); ACL = The Adjective Checklist (Siperstein & Bak, 1977); SAQ = Shared Activities Questionnaire (Morgan et al., 1996); SAQ – Other = modified Shared Activities Questionnaire; SRF = Similarity Rating Form (Campbell, 2005); PRQ = Perceived Responsibility Questionnaire (Campbell, 2005); MAS = Multidimensional Attitudes Scale (Findler et al., 2007); KOA = Knowledge of Autism (Campbell, 2007); BAPQ = Broad Autism Phenotype Questionnaire (Hurley et al., 2007); and AKQ = Autism Knowledge Questionnaire (Kuhn & Carter, 2006).

presented the information versus mother or father. Dachez and Ndobu (2018) also found source effected behavioral attitudes of peers. Dachez and Ndobu (2018) examined impact of information source and information content on peer attitudes. More specifically, college students were assigned to view one of three videos: no description of focal student; descriptive, explanatory and directive (i.e., strategies to interact with people with ASD) information about focal student; and video with no description and focal student came out and in person provided information to students. Results indicated students in the group where the focal student came out and provided information in person responded more positively.

Matthews and colleagues (2015) was the only study that examined attitudes of peers toward an individual with ASD using a written vignette. Two hundred twenty-four undergraduate students were randomly assigned to read one of three vignettes which depicted an interaction with a character displaying characteristics similar to an individual with ASD. The three vignettes varied only by the labeling of the main character (i.e., high functioning autism [HFA] label, typical college student label, no label). Results indicated participants in the HFA label condition reported significantly more positive behavioral and cognitive attitudes toward the main character in the vignette than students in the no label condition.

Ethnography

Ochs et al. (2001) used ethnography as a means to examine the inclusion experiences of 16 students with HFA. Ethnography is a way of collecting data in “real world” contexts to understand the lived experiences of participants from their perspectives (Mertens, 2010). As such, Ochs and colleagues (2001) conducted observations at

participants’ schools and in their homes to make sense of the social inclusion of students with ASD. The participants were students, eight to twelve years old, all educated in mainstream public schools. All students were video recorded at school during structured and unstructured activities for a minimum of 10 hrs, at home for a minimum of four hrs, and families provided additional audio recordings at home. Fourteen families disclosed the child’s diagnosis to school staff, one family did not, and one family did not provide researchers’ information on whether or not they disclosed. Seven students disclosed their diagnosis to their peers, eight students did not, and one family did not provide that information. Two families came into the student’s classroom and engaged in interactive discussions with the students about the focal student. More specifically, one family brought in a behavioral therapist to speak with the class. The focal student’s mother also spoke with the class and frequently visited the class and the teacher engaged in efforts to create a classroom community. The other student introduced himself to the class with the help of his mother. The student provided a manual for their peers that included information about how all children are different, described the talents and characteristics of the focal student, and provided peer strategies on how to interact with the focal student.

An analysis of the recordings indicated students who disclosed their diagnosis to their peers experienced more positive inclusion experiences. More specifically, their peers were more tolerant and attempted to include the focal student in activities or in their social group. The two students whose families engaged in interactive discussions with the class experienced positive peer relationships and positive responses from peers even when the focal student behaved in unusual ways. The two students had a 50

point difference in their IQ and their schools were different socioeconomically and ethnically. Regardless of the different characteristics of the two students with HFA and their schools, both students had supportive peers as evidenced by how compassionate the peers were and how they accepted the student with ASD's ideas. The student who did not disclose their diagnosis to school staff or peers consistently experienced negative inclusion by peers and was often ignored and rejected by peers.

Case Study

Bennett et al. (1996) conducted a case study to better understand the successful inclusion experiences of a six-year-old student with HFA. A case study is an in-depth exploration of a phenomenon (McDuffie & Scruggs, 2008). As such, Bennett et al. (1996) explored what made inclusion successful for a young child with HFA by gaining information from the student's mother. The mother identified several factors contributing to her daughter's successful inclusion with her peers and one of the factors was explaining to peers why the student "may act different" (p. 185). The focal student's teachers spoke with the class "about how children are all different and have different needs." (p. 185). The mother felt sharing this information with peers was critical to helping peers understand her child.

Summary of Findings and Areas for Future Directions

The ten studies included in this review included participants across a wide range of ages. Studies included young children (e.g., Bennet et al., 1996), adolescents (e.g., Campbell, 2007), and young adults (e.g., Matthews et al., 2015). Studies used vignettes which utilized actors portraying characteristics of a student with ASD (e.g., Campbell et al., 2004) and others used observation to gain a better understanding of

the lived experience of students who disclose their diagnosis to their peers (Ochs et al., 2001). Overall, there were positive outcomes associated with diagnosis disclosure. Specific characteristics of the way in which diagnosis was disclosed were evaluated and yielded some themes.

For college-aged students, positive outcomes were associated with simple strategies. In one study, those who read vignettes of a peer who displayed symptoms of ASD reported more positive behavioral attitudes about the peer when the vignette included a label of HFA versus the vignette that did not include a label (Matthews et al., 2015). While in another study, when a video was combined with a personal interaction with the individual who had ASD, students had more positive emotions, cognitions, and behaviors compared to students who only viewed videos, regardless of if explanatory information was included or not (Dachez & Ndobbo, 2018).

Research with school-aged children evaluated delivery formats and content, as well. When studies combined descriptive information (such as what the peers and focal student had in common) with explanatory information (characteristics of ASD), the most favorable outcomes were found among the majority of the studies. Specifically, improved cognitive attitudes, intentions to engage in shared activities (Campbell et al., 2004) and positive social intentions (Campbell, 2007) were noted. Students with prior knowledge of ASD have also been found to report more positive attitudes (Campbell, 2007), suggesting that learning about ASD over time is beneficial to the development of peer relationships. Other research found that students reported the most positive behavioral intentions when they viewed vignette videos that included specific strategies for interacting with a peer

who has ASD (Silton & Fogel, 2012). This finding is supported by the peer-mediated literature which continually documents increased social interaction and engagement when peers are taught how to engage with the student with ASD (Wong et al., 2014). Sharing strategies might be an essential piece in helping students develop friendships. Finally, the person who shares the diagnosis impacts students' intentions to engage in shared activities, but it differs by age of student (Morton & Campbell, 2008). This highlights that students may view respected individuals differently across grades.

These research outcomes align with attribution theory in that students who know their peer has ASD can attribute behavior to having ASD (e.g., the diagnosis) as opposed to the peer's character or intentions (Weiner, 1974). Because ASD is an "invisible" disability, providing context around why atypical behaviors occur can be insightful for peers who do not recognize any physical difference between themselves and their peer with ASD. While this research is in its infancy, the current literature base suggests that diagnosis related information can aid in more positive inclusion practices. Based on the findings, most research indicates when peers know the student has ASD they are more likely to report intentions to engage socially and/or academically with the focal student and generally have more positive attitudes about the focal student. Given the poor social experiences of students with ASD (Petrina et al., 2014; Sreckovic et al., 2014), diagnosis disclosure may result in increased social interaction, friendships, and acceptance by peers (Ochs et al., 2001). Further, when disclosed in a way that provides strategies and ongoing support there is the potential for the development of positive relationships within classroom settings. Although there is not a lot of research in this area, the work that has been

done, allows for recommendations for practice.

Recommendations for Practice

The research suggests simply disclosing diagnosis is associated with positive outcomes related to peer attitudes and intentions. Specifically, sharing diagnosis to peer groups versus not sharing has resulted in more positive peer attitudes (Matthews et al., 2015) and actions (Ochs et al., 2001). Further, personalizing the experience by engaging peers in an interactive discussion about the focal student's diagnosis and ways to interact with the focal student has resulted in even more positive peer experiences (Ochs et al., 2001). It is recommended that teams, including the individual with ASD and their family, consider disclosing diagnosis in the classroom and other group settings. The individual with ASD and their family need to make the final decision on whether to move forward with disclosing. Students with ASD and their families have protections under IDEA (2004) and have the right to the privacy of their educational records, including special education classification and medical diagnoses (Family Educational Rights and Privacy Act of 1974). Sharing a label is a personal decision and ultimately should be left to the family. However, professionals on the team can help empower families to make an informed decision by sharing related research. If a family chooses to disclose diagnosis related information, the recommendations listed below can guide the process in deciding how to disclose, what information to disclose, and who should disclose the information.

Once the decision is made to disclose, it is helpful when disclosing diagnosis to include information about autism and how peers can interact with each other. The majority of studies that used fictitious vignettes concluded that providing explanatory

information about a student's diagnosis to be more beneficial than just describing similarities between the focal student and their peers (Campbell, 2007; Campbell et al., 2004, 2005). Including information on peer strategies and student strengths in addition to descriptive and explanatory information has also been found to be beneficial (Silton & Fogel, 2012). It is recommended that lessons related to disclosure include ASD specific information, as well as strategies for peers to use when interacting in the classroom. Further, it is encouraged that classroom teachers incorporate information about differences throughout the year and build a classroom community (Sreckovic, Schultz, Kenney, & Able, 2018). When a student chooses to share their diagnosis it should be an ongoing conversation about how students can support one another and include one another. Teachers and parents are in a unique position to explain atypical behaviors when they occur to help peers understand the nature of the behavior in school and home settings. The teacher will ultimately be responsible for providing ongoing support of social interactions, modeling peer supports, reinforcing appropriate and effective peer behavior and facilitating an accepting, inclusive environment. We encourage teachers to implement strategies consistent with peer-mediated instruction/intervention (Wong et al., 2014) and strategies that build a classroom community (Sreckovic et al., 2018) throughout the school year.

Finally, information source effects peer attitudes. Peers respond more favorably when the person with ASD provides information in person versus a video (Dachez & Ndobu, 2018) and when a teacher, doctor or video provide information versus a parent (Morton & Campbell, 2008). It is recommended that teachers and families take this into consideration when choosing how a student should disclose their diagnosis. Young

children may need additional support from a teacher, parent, or doctor. Reflecting on the grade level and who students respect can aid in making that decision.

While this synthesis highlights the benefits of diagnosis disclosure, it is imperative that the results are considered in light of the limitations. Mainly, all but two of the included studies used fictitious students with ASD. The two studies that examined the lived experiences of students with ASD (Bennett et al., 1996; Ochs et al., 2001) clearly highlight the positive outcomes associated with diagnosis disclosure, but those studies are few.

Future Directions for Research

Overall, results indicate peers are more accepting when students with ASD shared their diagnosis. However, much information is needed about the contextual experiences related to how diagnosis information is shared and how peers respond in order to aid in making recommendations to practitioners and families.

First, it is important to understand how teachers and/or families disclose the information. There are many possibilities for how the diagnosis information could be shared, ranging from a conversation between a family and a teacher who shares with students, to a family member visiting the classroom to share information and answer questions. The sessions could be conducted in a way that the adult is sharing information or in a more interactive way that allows students to share and ask questions. Additionally, it is possible that this could be a one-time lesson or an ongoing discussion over multiple days, weeks, or months. Though current research has evaluated a few of these options, future research should explore the best formats for disclosing diagnosis and strategies teachers implement

to cultivate an accepting community of learners after diagnosis related information is shared.

Relatedly, future research should examine specific outcomes associated with disclosure. Were more friendships formed? Did peers actually engage with students with ASD more? Were students stigmatized after they disclosed their diagnosis? Were students bullied? What are the lived experiences of individuals with ASD who disclose their diagnosis to their peer group? The two studies that did report about actual students with ASD (Bennett et al., 1996; Ochs et al., 2001) concluded that diagnosis disclosure does aid in positive inclusion practices. However, most of the research focuses on changes in attitudes and thoughts, as opposed to long-term behavior change. Future research needs to evaluate variables associated with inclusive behaviors, especially from the perspective of the individuals with ASD.

The current research has evaluated disclosure in school settings. Within this context, disclosure had positive results for young adults who were in college. Future research should continue to explore disclosure for adults. In particular, we encourage future research teams to examine diagnosis disclosure in employment and community

settings. Employment and community settings vary considerably from academic settings, presenting potential obstacles and concerns related to disclosure. However, employment and community settings are also a primary social context for adults to form friendships. Future research should explore if disclosure promotes friendship development at work as well as continuous employment, as getting and maintaining employment has been documented as a major concern for adults with ASD (Shattuck et al., 2012). If so, what characteristics of the disclosure process are associated with the best outcomes? Relatedly, does sharing diagnosis related information in community settings (e.g., a book club at the local library) promote friendship development?

Next steps for research also include exploring cultural differences in how families perceive and experience diagnosis disclosure. Different cultures view disabilities in different ways with varying degrees of acceptance. Diagnosis disclosure is likely to have different implications and outcomes across cultures. For some families, disclosure may not be acceptable or only acceptable in certain contexts. Understanding how families perceive diagnosis and subsequently how families experience the disclosure process would inform future practice in a way that could support family culture.

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Bennett, T., Rowe, V., & DeLuca, D. (1996). Getting to know Abby. *Focus on Autism and Other Developmental Disabilities, 11*, 183-188.
- Campbell, J. M. (2006). Changing children's attitudes towards autism: A process of persuasive communication. *Journal of Developmental and Physical Disabilities, 18*, 251-272. doi: 10.1007/s10882-006-9015-7
- Campbell, J. M. (2007). Middle school students' response to the self-introduction of a student with autism: Effects of perceived similarity, prior awareness, and educational message. *Remedial and Special Education, 28*, 163-173.

- Campbell, J. M., & Barger, B. D. (2010). Middle school students' knowledge of autism. *Journal of Autism and Developmental Disorders*, *41*, 732-740. doi:10.1007/s10803-010-1092-x.
- Campbell, J. M., Ferguson, J. E., Herzinger, C. V., Jackson, J. N., & Marino, C. A. (2004). Combined descriptive and explanatory information improves peers' perceptions of autism. *Research in Developmental Disabilities*, *25*, 321-339.
- Campbell, J. M., Ferguson, J. E., Herzinger, C. V., Jackson, J. N., & Marino, C. A. (2005). Peers' attitudes toward autism differ across sociometric groups: An exploratory investigation. *Journal of Developmental and Physical Disabilities*, *17*, 281-298.
- Carter, E. W., Common, E. A., Sreckovic, M. A., Huber, H. B., Bottema-Beutel, K., Redding, J. T., ... Hume, K. (2014). Promoting social competence and peer relationships for adolescents with Autism Spectrum. *Remedial and Special Education* *35*, 91-101. doi:10.1177/0741932513514618.
- Chan, J. M., Lang, R., Rispoli, M., O'Reilly, M., Sigafoos, J., & Cole, H. (2009). Use of peer-mediated interventions in the treatment of autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders*, *3*, 876-889. doi:10.1016/j.rasd.2009.04.003.
- Dachez, J. & Ndobo, A. (2018) The effects of descriptive, explanatory, and directive information associated with personalised interaction on the attitudes toward an adult with high-functioning autism. *Journal of Intellectual & Developmental Disability*, *43*(1), 49-60.
- Disclose (2019). In *Merriam-Webster.com*. Retrieved June 25, 2019, from <https://www.merriam-webster.com/dictionary/disclose>
- Education for All Handicapped Children Act, Pub. L. No. 94-332 (1975).
- Endrew F. v. Douglas County School District, 580 U.S. Supreme Court (2017).
- Family Educational Rights and Privacy Act, 34 C.F.R. § 99 (1974).
- Frederickson, N. (2010). The Gulliford Lecture: Bullying or befriending? Children's responses to classmates with special needs. *British Journal of Special Education*, *37*, 4-12.
- Gray, D. (2002) 'Everybody just freezes. Everybody is just embarrassed': Felt and enacted stigma among parents of children with high functioning autism. *Sociology of Health and Illness*, *24*, 734-49. doi: doi.org/10.1111/1467-9566.00316
- Hamm, J. V., & Faircloth, B. S. (2005). The role of friendship in adolescents' sense of school belonging. *New Directions for Child and Adolescent Development*, *107*, 61-78. doi: 10.1002/cd.121
- Hay, M. C. (2010). Suffering in a productive world: Chronic illness, visibility, and the space beyond agency. *American Ethnologist*, *37*, 259-274. doi: 10.1111/j.1548-1425.2010.01254.x
- Heinrichs, R. R. (2003). A whole-school approach to bullying: Special considerations for children with exceptionalities. *Intervention in School and Clinic*, *38*, 195-205.
- Individuals with Disabilities Education Act, 20 U.S.C. §§ 1400 et seq. (2006 & Supp. V. 2011).
- Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, *2*, 217-250.
- Lasgaard, M., Nielsen, A., Eriksen, M. E., & Goosens, L. Loneliness and social support in adolescent boys with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *40*, 218-226.
- Lisser, M., & Westbay, J. (2001). Making friends with aliens: Inclusion and collaborative autobiography. In L. Andron (Ed.), *Our journey through high functioning autism and Asperger syndrome: A roadmap* (pp. 133- 175). Philadelphia: Kingsley.

- Little, L. (2002). Middle-class mothers' perceptions of peer and sibling victimization among children with Asperger's syndrome and nonverbal learning disorders. *Issues in Comprehensive Pediatric Nursing, 25*, 43-57.
- Matthews, N. L., Ly, A. R., & Goldberg, W. A. (2015). College students' perceptions of peers with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 45*, 90-99.
- Mertens, D. M. (2010). *Research and Evaluation in Education and Psychology*. Thousand Oaks, CA: Sage Publications.
- McDuffie, K. A., & Scruggs, T. E. (2008). The contributions of qualitative research to discussions of evidence-based practice in special education. *Intervention in School and Clinic, 44*, 91-97.
- Morton, J. F., & Campbell, J. M. (2008). Information source affects peers' initial attitudes toward autism. *Research in Developmental Disabilities, 29*, 189-201.
- Ochs, E., Kremer-Sadlik, T., Solomon, O., & Sirota, K. G. (2001). Inclusion as a social practice: Views of children with autism. *Social Development, 10*, 399-419.
- Petrina, N., Carter, M., & Stephenson, J. (2014). The nature of friendship in children with autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders, 8*, 111-126.
- Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). Postsecondary education and employment among youth with an autism spectrum disorder. *Pediatrics, 129*, 1042-1049.
- Silton, N. R., & Fogel, J. (2012). Enhancing positive behavioral intentions of typical children towards children with autism. *Journal of Cognitive Behavioral Psychotherapies, 12*, 139-158.
- Sreckovic, M. A., Brunsting, N. C., & Able, H. (2014). Victimization of students with autism spectrum disorder: A review of prevalence and risk factors. *Research in Autism Spectrum Disorders, 8*, 1155-1172. doi: 10.1016/j.rasd.2014.06.004
- Sreckovic, M. A., Schultz, T. R., Kenney, C., & Able, H. (2018). Building classroom communities in the inclusive classroom: Setting the stage for success. *Young Children, 73*, 75-81.
- Swaim, K. F., & Morgan, S. B. (2001). Children's attitudes and behavioral intentions toward a peer with autistic behaviors: Does a brief educational intervention have an effect? *Journal of Autism and Developmental Disorders, 31*, 195-205.
- U.S. Department of Education, Office of Special Education and Rehabilitative Services, Office of Special Education Programs, *40th Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act, 2018*, Washington, D.C. 2018.
- Weiner, B. (1974). *Achievement motivation and attribution theory*. Morristown, N.J.: General Learning Press.
- Wentzel, K. R., Donlan, A., & Morrison, D. (2012). Peer relationships and social motivational processes. In A. M. Ryan & G. W. Ladd (Eds.), *Peer relationships and adjustment at school* (pp. 79-108). Charlotte, NC: Information Age Publishing.
- Winchell, B. N., Sreckovic, M. A., & Schultz, T. R. (2018). Preventing bullying and promoting friendship for students with ASD: Looking back to move forward. *Education and Training in Autism and Developmental Disorders, 53*, 243-252.
- Wong, C., Odom, S. L., Hume, K., Cox, A. W., Fettig, A., Kucharczyk, S., ... Schultz, T. R. (2014). *Evidence-based practices for children, youth, and young adults with Autism*

Spectrum Disorder. Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, Autism Evidence-Based Practice Review Group.

Yudkowsky, E. (2015). *Harry Potter and the methods of rationality*. Retrieved from: <http://www.hpmor.com/>

Zablotsky, B., Bradshaw, C. P., Anderson, C., & Law, P. A. (2013). The association between bullying and the psychological functioning of children with Autism Spectrum Disorders. *Journal of Developmental Behavior Pediatrics, 34*, 1–8.

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Collaboration to Improve Employment Outcomes for Youth with Disabilities: Implications of the Pre-ETS Components of WIOA on IDEA Transition Requirements

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Abstract: The Workforce Innovation and Opportunity Act of 2014 (WIOA) amended the Rehabilitation Act of 1973 and reemphasized competitive, integrated employment as the goal of vocational rehabilitation (VR) services. WIOA also mandated the provision of pre-employment transition services and funding to students prior to graduation, as well as formal interagency collaboration between service agencies. With Pre-ETS partnering VR and schools together to focus on transition-aged youth with disabilities, questions remain. Namely, how do WIOA & IDEA intersect to guide practice for transition-aged youth, and how will states and localities act on WIOA mandates to increase CIE opportunities for youth with IDD? Many states and communities have already started implementing innovative new programs that merit broader replication. The purpose of this paper is to share strategies for effective implementation of WIOA with practitioners in order to create opportunities and maximize the benefit of interagency collaboration with other stakeholders.

The labor force and employment opportunities for workers have changed dramatically in the last few decades (Bureau of Labor Statistics, 2014), yet employment outcomes for individuals with disabilities remain poor (Hiersteiner, Bershadsky, Bonardi, & Butterworth, 2016). In response to these challenges, the Workforce Innovation and Opportunity Act of 2014 (WIOA, 2014) reauthorizes the Workforce Investment Act of 1998 and amends the Rehabilitation Act of 1973 to update the national workforce preparation system for employers and job seekers. For individuals with disabilities, WIOA mandates competitive integrated employment (CIE) as the preferred outcome for vocational

rehabilitation (VR) services, strengthening the commitment of past legislation to CIE rather than segregated and enclave settings (Wehman et al., 2018). WIOA specifically focuses on improving CIE outcomes for youth with disabilities by expanding services provided to secondary school age youth and by requiring that 15% of allotted state VR budgets be spent on pre-employment transition services (Pre-ETS; Workforce Innovation Technical Assistance Center [WINTAC], 2019).

Pre-ETS involve interagency collaboration between local education agencies (LEA) and state VR agencies responsible for coordinating these services for all students

with disabilities. This mandate for collaboration to expand employment opportunities primarily involves VR and LEA, but also can include workforce development boards, one-stop centers, community rehabilitation providers, centers for independent living, and employers (WINTAC, 2019). Required Pre-ETS activities include job exploration counseling, work-based learning experiences, counseling on postsecondary education and comprehensive transition program opportunities, workplace readiness training, and self-advocacy instruction (WINTAC, 2019).

The expansion of transition-age services targeting students prior to graduation is in response to persistently poor employment outcomes for youth and adults with disabilities, especially for those with various intellectual and developmental disabilities (IDD), including autism and intellectual disability. According to NLTS-2 data, youth with autism experience lower rates of employment than those of any disability category, with only 14% working in the community in paid CIE (Roux, Rast, Anderson, & Shattuck, 2017). Furthermore, only 26% of transition-aged youth with significant disabilities, defined by participation in alternative assessments and difficulty with functional life skills, reported having a job in the first two years following high school (Carter, Austin, & Trainor, 2012). For many adults with IDD, segregated work settings and enclaves remain a common postsecondary outcome (Butterworth, Hiersteiner, Engler, Bershadsky, & Bradley, 2015).

Segregated employment outcomes mirror K-12 and postsecondary education research showing a persistence of placement of students with IDD in segregated educational settings (Kurth, Morningstar, & Kozleski,

2014) and limited access to postsecondary educational opportunities (Grigal, Papay, Smith, Hart, & Verbeck, 2019). In addition to providing work opportunities and transition services during high school years, the Higher Education Opportunity Act of 2008 allocated funds to provide transition-focused postsecondary programs for individuals with intellectual disability as another effort to improve employment rates. Federal funding for these programs were predicated on data demonstrating that employment outcomes improved with increased postsecondary educational opportunities (Baum, Ma, & Payea, 2013; Bureau of Labor Statistics, 2017). However, these data described employment outcomes for youth without disabilities with no supporting data that similar results could be achieved by youth with disabilities, and particularly youth with IDD. Recent studies, however, have demonstrated that attendance in postsecondary education programs for youth with IDD did improve outcomes. In particular, a recent study by Cimera, Thoma, Whittenburg, & Ruhl (2018) found that participation in postsecondary education resulted in improved employment outcomes and was the most cost-effective for the client and taxpayer. That is, even with the increased cost of higher education, the benefit of increased wages and hours more than offset the cost of tuition and other VR services. Furthermore, the decrease in subsidies required by these PSE participant VR clients compensated for service costs, also making it a cost-efficient financial investment of public funds (Cimera et al., 2018; Whittenburg, Cimera, & Thoma, 2019)

Other research that examined predictors of CIE have identified promising practices for transition-aged youth, including employment experience prior to graduation (Wehman, Sima, Ketchum, West, Chan, & Luecking, 2015), high parental expectations (Carter et

al., 2012), student self-determination (Shogren, Wehmeyer, Palmer, Rifenbark & Little, 2013), and interagency collaboration and engagement (Sung, Sanchez, Kuo, Wang, & Leahy, 2015). For adults with ID, almost 75% of those who became competitively employed had their first job before age 21 and received job training while still in high school (Siperstein, Heyman, & Stokes, 2014). For those with autism, 90% of youth who had a paid job during high school went on to become employed after graduation, compared to only 40% that did not (Roux, Rast, Rava, Anderson, & Shattuck, 2015). However, despite strong, consistent evidence for interventions focusing on employability instruction and community-based work experience (Langi, Oberoi, Balcazar, & Awsumb, 2017; Wehman et al., 2017), many youth with IDD leave high school without these crucial experiences. Recent data suggest only 4-9% of young adults who receive services from state IDD agencies participate in individualized, integrated employment, and those who do most often work for low wages and limited hours (Butterworth, Christensen, & Flippo, 2017).

Arguably, federal mandates under both the Individuals with Disabilities Education Improvement Act (IDEA; 2004) and WIOA's Pre-ETS requirements were developed to improve poor employment outcomes and offer opportunities for youth with IDD to receive effective transition supports and services. Both laws identify interagency collaboration as a key strategy for leveraging expertise from schools, community and VR agencies, and other stakeholders who can identify adult supports and services that can help specific students achieve their postsecondary goals (Povenmire-Kirk et al., 2018). This collaboration necessitates a reconsideration of the roles and responsibilities of practitioners, as well as

innovative approaches to programming (WIOA, 2014). However, as wide-scale implementation of WIOA continues, much uncertainty remains. It is unclear how schools, VR, and other partners will collaborate to provide Pre-ETS and what resources might be available within localities to deliver services. While each state has outlined a plan for implementing WIOA requirements, there is a lack of information about how promising practices might be incorporated into Pre-ETS activities and foster interagency collaboration. The purpose of this paper is to share strategies for effective implementation of WIOA with practitioners in order to create opportunities and maximize the benefit of interagency collaboration with other stakeholders.

WIOA & IDEA: The Odd Couple

The intersection of special education and vocational education is bound through transition services mandated by legislative policies enacted with the goal of increasing postsecondary employment opportunities and outcomes for students with disabilities. Iterations of the Rehabilitation Act (1973) and IDEA have laid the foundation to amplify the need for both workplace inclusion and student preparedness. In addition, WIOA has powerful implications for interagency collaboration to support and increase employment outcomes for individuals with disabilities in the workplace. Consequently, the juxtaposition of vocational directives of WIOA along with the transition mandates of IDEA can make it difficult for practitioners to understand the commonalities and differences between employment and transition policy for students with disabilities who seek to transition from school to work.

WIOA seeks to provide youth and adults with employment training and services with the goal of supporting business needs and reducing personnel gaps. Most importantly,

the law intends to establish competitive employment for traditionally underserved populations including individuals with disabilities. The Office of Disability Employment Policy reports that approximately one-third of people with disabilities are employed, compared to over two-thirds of people without disabilities (Anderson, Larson, & Wuorio, 2011). As mentioned previously, for individuals with IDD, these outcomes are even poorer (Butterworth et al., 2015). WIOA demonstrates the evolution of federal transition and disability employment policy toward the belief that all individuals with disabilities are employable in competitive, integrated jobs in the community.

Perhaps WIOA's most significant provision relates to funding allocations as each state is required to dedicate 15% of its federal grant funds to Pre-ETS. With disheartening employment outcomes, it is crucial to provide students with supports that lead to gainful work. Pre-ETS seek to fill the employment gap frequently experienced by transition-aged youth with disabilities by providing students with five *required* services: job exploration counseling; work-based learning experiences; counseling related to transition or post-secondary education; workplace readiness training; and instruction in self-advocacy (WIOA, 2014). Subsequently, the 1990 and 1997 Amendments to IDEA establish transition services to support students in the development of meaningful goals and to positively influence their postsecondary outcomes in the areas of education, employment and independent living. Specifically, the process intends to provide students disabilities with coordinated transition activities informed by multidisciplinary planning teams considering students' long-term goals for their future.

Both IDEA and WIOA legislation agree in their requirement to address training and fiscal responsibility. Each law includes language to discuss how technical assistance and professional development will be provided to teachers and administrators, while each also seeks to ensure that the fiscal obligation and responsibilities of both the local and state agencies for transition services for which they are already legally responsible (WINTAC, 2019). Although the requirements of interagency agreement for both policies must include provisions for procedures for outreach, coordination with education officials, and coordination of services, there are still several differences within their respective areas of focus.

For example, while IDEA suggests a process and responsibility for the referral of students for services, WIOA stipulates active outreach and early identification of needs. Similarly, WIOA places a stronger and more specific emphasis on starting the collaborative process with schools and families prior to leaving school. WIOA also specifically addresses requirements for limiting subminimum wage employment of students. Both WIOA and IDEA offer a definition of transition that is similar in language and scope, yet WIOA accentuates employment outcomes and parental outreach and engagement (WINTAC, 2019). Table 1 provides a summary of differences between IDEA and WIOA.

Contrasts between WIOA and IDEA also emerge when considering how the two pieces of legislation address interagency collaboration. Interestingly, only WIOA requires a formal interagency agreement, emphasizes collaboration for transition planning, and requires that specific roles and responsibilities are addressed within the agreement. Most importantly, WIOA prohibits local and state agency contracts

Table 1. *Differences between the Individuals with Disabilities Education Improvement Act (2004) and the Workforce Innovation and Opportunity Act (2014)*

IDEA (2004)	WIOA (2014)
Requires individualized transition planning	Requires states provide Pre-ETS to youth with disabilities
Involves development of measurable postsecondary goals	Makes state VR agencies responsible for coordinating these services
Requires student be invited to IEP meeting if transition will be discussed	Requires interagency cooperation between VR and schools
Entails provision of services and supports needed to make progress towards goals	Designates funding (15% of federal allocation) for Pre-ETS to students in school
Does not address wages	Limits use of subminimum wages
Does not include specific employment types or interventions	Includes customized employment

with entities that fail to compensate students with disabilities at minimum wage. Conversely, only IDEA requires procedures for resolving interagency disputes (WINTAC, 2019). Both WIOA AND IDEA seek to align and connect a shared vision for transition services. With these new changes in transition policy, school and adult organizations can better support individuals with disabilities to obtain and retain CIE through improved collaboration between schools, state vocational rehabilitation agencies, and other transition practitioners.

Strategies for Transition Practitioners

While a number of questions remain to be addressed about how the overlapping mandates of WIOA and IDEA will be negotiated in future policy and practice, there are already many opportunities for practitioners to capitalize on these legislative mandates to improve transition effectiveness and employment outcomes for youth. While schools will likely continue to take the lead in the transition-planning process in the near

future, VR counselors should be increasingly invited to take on a more active role in the process. Although direct service delivery of Pre-ETS in various communities will likely vary greatly, VR counselors can serve as a critical dissemination point to communicate relevant Pre-ETS opportunities that align with students' transition and career goals. As state VR agencies redirect designated resources and funding toward providing Pre-ETS, practitioners should seek out information about new programs and resources that may be relevant for their students and for youth with disabilities more generally. Most importantly, it is important that youth with disabilities receive the services that have been linked to improved employment outcomes such as inclusive education throughout the K-12 years, early employment opportunities, opportunities to strengthen self-determination, counseling and preparation for postsecondary education opportunities, and support for students and families to maintain high expectations for postschool outcomes (Mazzotti, Rowe,

Sinclair, Poppen, Woods, & Shearer, 2016). Table 2 lists strategies based on these predictors of postsecondary success that should be incorporated into student transition planning.

Although states are at different stages in outlining their procedures for implementing the Pre-ETS requirements under WIOA, these recommendations can help practitioners capitalize on increased programming and collaboration through Pre-ETS while aligning transition planning and activities with research-based predictors of CIE. In addition to these general strategies, school-based transition practitioners should

keep abreast of state and local implementation of Pre-ETS.

While WIOA sets ambitious targets and leverages funds in unprecedented ways to provide greater access to services for school-aged youth with disabilities through Pre-ETS activities, the implementation of related initiatives from state to state and locality to locality differ greatly. As a result, practitioners should review some of the more common approaches to Pre-ETS across the country, as well as seek out more information about opportunities in their community. Seeking out training and information disseminated by local VR offices and other rehabilitation agencies and providers may

Table 2. *Recommended Strategies for Transition Practitioners*

Strategy	Description
Expand collaboration between VR and schools	VR counselors should be invited to transition meetings, but collaboration can extend to more general program development leading to work experiences like internships, job shadowing, and workplace readiness training.
Seek out and disseminate information about specific Pre-ETS opportunities	Each state and locality implements Pre-ETS requirements differently based on community and individual needs. Learning about Pre-ETS opportunities and sharing this information with others is key to making the most of these efforts.
Encourage inclusive education and community-integrated work-based learning for students	Inclusive education has been shown to predict better postsecondary outcomes in employment and education. Likewise, work-based learning experiences should be integrated to prepare students for CIE.
Provide work-based learning experiences	Students who have work experience prior to graduation have better adult outcomes. Promoting part-time work and internship opportunities should be part of transition programming for all students.
Promote opportunities to strengthen student self-determination	Student self-determination is key to better transition outcomes and can be improved through activities like goal setting, decision making, and student-led IEPs.
Provide counseling on postsecondary educational options for <i>all</i> students	PSE, including college and training, is an essential pathway to CIE for students, regardless of disability. It is important for practitioners to learn about PSE options and how they align with career goals.

Table 3. *Potential partners and examples of collaboration*

Partnering agency	Examples of collaboration
Businesses	<ul style="list-style-type: none"> • Provide students with career information • Mock interviews for student job seekers • Part-time and summer work opportunities and internships • Work-based learning experiences
Community Services Board	<ul style="list-style-type: none"> • Provide transportation training • Fund social-behavioral or mental health wraparound support • Engaging youth in the community through therapeutic recreation activities
Local Vocational Rehabilitation Services Agencies	<ul style="list-style-type: none"> • Participating in student transition meetings • Sponsor work experiences for high school students • Deliver work readiness and self-advocacy training for students • Help students identify strong job matches and potential career paths
Community Rehabilitation Providers/Employment Service Organizations	<ul style="list-style-type: none"> • Provide information to students about job accommodations • Support job development, job placement and on-the-job training for students • Provide customized employment services to identify and match students' strengths and interests with local employer needs
Centers for Independent Living	<ul style="list-style-type: none"> • Coach students on self-advocacy and independent living • Train individuals on a range of topics from sexuality and leisure to transportation and financial planning
Local Colleges and Technical Training Centers	<ul style="list-style-type: none"> • Host information fairs about financial aid, disability support services, and campus accessibility • Partner with VR and school practitioners to provide greater access to students with disabilities

lead to potential partnerships that could greatly benefit students with disabilities. Table 3 shows a list of potential partnering agencies that transition teams may consider for providing valuable services for students. Each of these partners has unique expertise, access to funding, and opportunities for learning experiences. Effective transition planning should incorporate consultation and collaboration from multiple stakeholders who provide services and expertise in alignment with student goals and needs.

In addition to the collaborative activities listed in Table 3, many state VR units have created specific programs designed to address required Pre-ETS areas. A few examples of such programs are provided, though it should be noted that states and communities vary considerably in terms of programming.

Given the focus on increasing services for students themselves, there is clearly a need for more support within schools. This may include participation in transition planning

meetings for students, but could also include novel approaches like earlier enrollment of students for case management. Additionally, many VR agencies, both directly and through third-party agreements, have increased the direct service offerings for students prior to graduation in career exploration, work-based learning, post-secondary education, social skills, independent living, and self-advocacy training. Pre-ETS programming is also delivered through new and expanded services and partnerships outside of schools themselves. Several states promote participation in work-based learning through research-based internship models like Project SEARCH (Wehman et al., 2017), vocational training centers, apprenticeships, and through community-based occupational counseling. Other approaches empower families through transition-specific training and resources designed to increase parent expectations and enable stronger support for their youth. Although Centers for Independent Living have provided support and training for individuals with disabilities prior to WIOA, many VR agencies made specific partnership agreements to ensure students receive instruction in self-advocacy and personal independence. While these initiatives vary significantly across individual communities, there are many additional opportunities as a result of WIOA for students to engage in experiences to improve CIE outcomes.

Conclusion

WIOA's focus on providing more support for youth preparing for their transition to adult life has the potential for great progress toward establishing CIE as an expected outcome for all individuals. Through mandated Pre-ETS activities and interagency collaboration, states and localities are leveraging resources and innovating new programs and approaches to achieve these ends. However, as VR agencies expand services and engagement in K-12 settings, more guidance is needed in navigating overlapping policies between WIOA and IDEA. As best practices emerge from these collaborative activities, evaluation is needed to establish efficacy with students as a pathway to CIE. Funding will be imperative for the establishment of model demonstration projects designed to strengthen collaborative efforts that leverage the expertise of the members of re-configured transition teams. Additionally, more effort is needed to disseminate those best practices between states and localities to be adopted as standard practice rather than isolated examples. Practitioners play a vital role in putting this policy into action and should continue to be attentive to studies examining WIOA implementation and its impact.

References

- Anderson, L., Larson, S. A., Wuorio, A., & Lakin, K. C. (2011). *Still in the shadows with their future uncertain. A report on family and individual needs for disability supports (FINDS), 2011. Summary of Key Findings and a Call to Action*. The Arc. Retrieved from <https://eric.ed.gov/?q=source%3a%22The+Arc%22&id=ED525229>
- Baum, S., Ma, J., & Payea, K. (2013). *Education pays: The benefits of higher education for individuals and society*. New York: College Board.
- Bureau of Labor Statistics. (2014). Largest industries by state, 1990–2013. *The Economics Daily*, Retrieved from https://www.bls.gov/opub/ted/2014/ted_20140728.htm.
- Bureau of Labor Statistics. (2017). *Labor force statistics from the Current Population Survey*. Retrieved from <https://www.bls.gov/cps/cpsaat07.htm>

- Butterworth, J., Christensen, J., & Flipppo, K. (2017). Partnerships in Employment: Building strong coalitions to facilitate systems change for youth and young adults. *Journal of Vocational Rehabilitation*, 47(3), 265–276. <https://doi.org/10.3233/JVR-170901>
- Butterworth, J., Hiersteiner, D., Engler, J., Bershadsky, J., & Bradley, V. (2015). National core indicators: Data on the current state of employment of adults with IDD and suggestions for policy development. *Journal of Vocational Rehabilitation*, 42, 209-220.
- Carter, E. W., Austin, D., & Trainor, A. A. (2012). Predictors of postschool employment outcomes for young adults with severe disabilities. *Journal of Disability Policy Studies*, 23, 50-63. doi:10.1177/1044207311414680
- Cimera, R. E., Thoma, C. A., Whittenburg, H. N., & Ruhl, A. N. (2018). Is getting a post-secondary education a good investment for supported employees with intellectual disability and taxpayers? *Inclusion*, 6, 97-109.
- Grigal, M., Papay, C., Smith, F., Hart, D., & Verbeck, R. (2019). Experiences That Predict Employment for Students With Intellectual and Developmental Disabilities in Federally Funded Higher Education Programs. *Career Development and Transition for Exceptional Individuals*, 42(1), 17–28.
- Hiersteiner, D., Bershadsky, J., Bonardi, A., & Butterworth, J. (2016). *Working in the community: The status and outcomes of people with intellectual and developmental disabilities in integrated employment-Update 2*. Cambridge, MA: Human Services Research Institute.
- Individuals with Disabilities Education Improvement Act of 2004, Pub. L. No. 108–446 (2004).
- Langi, F. L. F. G., Oberoi, A., Balcazar, F. E., & Awsumb, J. (2017). Vocational rehabilitation of transition-age youth with disabilities: A propensity-score matched study. *Journal of Occupational Rehabilitation*, 27(1), 15–23. <https://doi.org/10.1007/s10926-016-9627-4>
- Kurth, J. A., Morningstar, M. E., & Kozleski, E. B. (2014). The persistence of highly restrictive special education placements for students with low-incidence disabilities. *Research and Practice for Persons with Severe Disabilities*, 39, 227–239. <https://doi.org/10.1177/1540796914555580>
- Mazzotti, V. L., Rowe, D. A., Sinclair, J., Poppen, M., Woods, W. E., & Shearer, M. L. (2016). Predictors of Post-School Success: A Systematic Review of NLTS2 Secondary Analyses. *Career Development and Transition for Exceptional Individuals*, 39(4), 196–215. <https://doi.org/10.1177/2165143415588047>
- Povenmire-Kirk, T. C., Test, D. W., Flowers, C. P., Diegelmann, K. M., Bunch-Crump, K., Kemp-Inman, A., & Goodnight, C. I. (2018). CIRCLES: Building an interagency network for transition planning. *Journal of Vocational Rehabilitation*, 49, 45–57. <https://doi.org/10.3233/JVR-180953>
- Rehabilitation Act of 1973*. , Pub. L. No. 93–112 (1973).
- Roux, A. M., Rast, J. E., Anderson, K. A., & Shattuck, P. T. (2017). *National autism indicators report: developmental disability services and outcomes in adulthood*. Drexel University. Retrieved March 12, 2019, from <https://drexel.edu/autismoutcomes/publications-and-reports/publications/National-Autism-Indicators-Report-Developmental-Disability-Services-and-Outcomes-in-Adulthood/>
- Roux, A. M., Rast, J. E., Rava, J., Anderson, K. A., & Shattuck, P. T. (2015). *National autism indicators report: transition into young adulthood*. Drexel University. Retrieved from <https://drexel.edu/autismoutcomes/publications-and-reports/publications/National-Autism-Indicators-Report-Transition-to-Adulthood/>

- Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Rifenbark, G. G., & Little, T. D. (2013). Relationships between self-determination and postsecondary outcomes for youth with disabilities. *The Journal of Special Education, 48*, 256–267. <https://doi.org/10.1177/0022466913489733>.
- Siperstein, G. N., Heyman, M., & Stokes, J. E. (2014). Pathways to employment: A national survey of adults with intellectual disabilities. *Journal of Vocational Rehabilitation, 41*, 165–178. <https://doi.org/10.3233/JVR-140711>
- Sung, C., Sánchez, J., Kuo, H.-J., Wang, C.-C., & Leahy, M. J. (2015). Gender differences in vocational rehabilitation service predictors of successful competitive employment for transition-aged individuals with autism. *Journal of Autism and Developmental Disorders, 45*, 3204–3218. <https://doi.org/10.1007/s10803-015-2480-z>
- Wehman, P., Schall, C. M., McDonough, J., Graham, C., Brooke, V., Riehle, J. E., ... Avellone, L. (2017). Effects of an employer-based intervention on employment outcomes for youth with significant support needs due to autism. *Autism, 21*, 276–290. <https://doi.org/10.1177/1362361316635826>
- Wehman, P., Sima, A. P., Ketchum, J., West, M. D., Chan, F., & Luecking, R. (2015). Predictors of successful transition from school to employment for youth with disabilities. *Journal of Occupational Rehabilitation, 25*, 323–334. <https://doi.org/10.1007/s10926-014-9541-6>
- Wehman, P., Taylor, J., Brooke, V., Avellone, L., Whittenburg, H., Ham, W., Brooke, A., Carr, S. (2018). Toward competitive employment for persons with intellectual and developmental disabilities: What progress have we made and where do we need to go. *Research and Practice for Persons with Severe Disabilities, 43*, 131–144. <https://doi.org/10.1177/1540796918777730>
- Whittenburg, H. N., Cimera, R. E., & Thoma, C. A. (2019). Comparing employment outcomes of young adults with autism: Does postsecondary educational experience matter? *Journal of Postsecondary Education and Disability, 32*, 159-172.
- Workforce Innovation and Opportunity Act of 2014, Pub. L. No. 113–128 (2014).
- Workforce Innovation Technical Assistance Center. (2019). Pre-employment transition services. Retrieved March 12, 2019 from <http://www.wintac.org/topic-areas/pre-employment-transition-services/resources>

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An Analysis of Social Validity Prevalence and Measurement within *Education and Training in Autism and Developmental Disabilities*

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Abstract: The purpose of this study was to evaluate social validity data as reported in single-case research design (SCRD) studies published in the journal Education and Training in Autism and Developmental Disabilities (ETADD) over 21-years encompassing the years 1997-2018. In the present study, the authors identified a total of 298 single-case research articles that were published in ETADD from 1997-2018 of which 138 articles or 46% reported on social validity. Trends in the use of formal and informal social validity measurement for behavior intervention studies were evaluated as was the reporting of partial and total construct social validity including the social significance of treatment goals, the appropriateness of treatment procedures, and the importance of treatment effects. The findings revealed a diverse array of procedures that in many cases lack uniformity, comprehensiveness, and clarity.

The construct of social validity was first introduced by Wolf (1978) and defined by three distinct components. These components were (a) the social significance of the goals of treatment, (b) the social appropriateness of the treatment procedures and (c) the social importance of the effects of treatment. Wolf (1978) stated that all three of these components must be present to be considered total construct social validity, as anything less would be termed partial construct. Partial construct measurement of the social appropriateness of treatment procedures is the most common form of social validity assessment (Carter & Wheeler, 2019), but does not represent the total construct proposed by Wolf unless measurement of the goals and effects of treatment are also measured. The value of social validity in the design, delivery and evaluation of treatments has been supported over time within the literature. Schwartz and Baer (1991) spoke to the importance of social validity in terms of designing treatments that were both relevant and valued by consumers. The field of special education and services to persons with autism

and developmental disabilities saw an expansion of this consumer-based framework with the advent of positive behavior interventions and supports (PBIS) with its focus on person-centered planning. Horner et al. (1990) expanded on this concept by identifying three criteria that treatments must meet before being considered as a treatment option within the PBIS model. These criteria included (a) the intrusiveness of a treatment upon the individual targeted for treatment, (b) the social acceptability of the treatment, and (c) the degree to which a competent professional supervises and monitors the treatment. While much of the groundwork for determining social significance was developed decades ago, the importance of social validity to ensuring meaningful interventions for consumers is just as relevant today as it was then.

Several recent reviews of social validity have been conducted with most of these reviews examining social validity across different journals with a focus on a specific target population. Overall, these reviews continue

to report a generally low prevalence of articles providing a report of social validity measurement. For example, Brosnan and Healy (2010) conducted a review of 18 articles focusing on interventions targeting aggression among individuals aged 3-18 with developmental disabilities. They reported that only one of the 18 studies provided an informal report of satisfaction among stakeholders and that none of the studies utilized any formal measure of social validity. Based on their review, Brosnan and Healy (2010) stated that measurement of social validity was "...at best tokenistic and at worst indiscriminately positive" (p. 445).

Similarly, Spear, Strickland-Cohen, Romer and Albin (2013) conducted a review of 22 single-case research studies in the literature of participants diagnosed or at-risk for emotional and behavior disorders. They reported that while social validity appeared to be implicit in several studies, the explicit reporting and use of social validity measures was low. Ledford, Hall, Conder, and Lane (2016) reviewed single-case research designs focused on young children with autism spectrum disorders (ASD) published from 1994 to 2013. They reported 44% of the studies reviewed included measurement of social validity. Ledford et al. suggested researchers report on the specific facets of social validity measured when conducting this type of research. Callahan et al., (2017) conducted a review of social validity reported within research using evidence-based and emerging practices for the treatment of ASD. They reviewed 828 targeted articles and found 221 (26.7%) directly reported measurement of social validity.

In a somewhat different type of review, Snodgrass, Chung, Meadan, and Halle (2018) conducted a review of social validity single case design research in six special education journals appearing between 2005 and 2016.

This review was different in that it did not focus on a specific topic or a specific population but rather examined all single case research design within specific journals and reported on the data from each journal rather than aggregating the data. In addition, they separated partial construct social validity from total construct social validity within the articles. The formula they used for discriminating between partial and total construct involved determining which articles reported on all three of Wolf's (1978) components of social validity and provided some analysis (graphs, tables, quotes, etc.), and offered details that included more than two sentences describing the data. Their review examined 429 single case research (SCR) design articles and found that 27% of those articles reported on social validity and only 7% of those articles reported on total construct social validity. Given the low percentages of studies reporting social validity as cited by these reviews it harkens for the need to continue to conduct systematic reviews of the literature as a means of evaluating whether this pattern improves. Given this trend the urgency of the present study appears warranted.

The purpose of this study was to extend the review conducted by Snodgrass et al. to include a similar examination of the journal *Education and Training in Autism and Developmental Disabilities (ETADD)*. In addition, as recommended by Ledford et al. (2016), the current study examined detailed variables of articles reporting total construct social validity in order to gain insights into the specific types of social validity measurement being utilized in articles representing total construct social validity assessment. The following research questions guided the study:

1. Research Question One: What is the prevalence of total construct social validity within *ETADD*?

2. Research Question Two: Of the total construct social validity reported in *ETADD*, what are the specific types of measurement being utilized?
3. Research Question Three: Is there a reliable instrument for measuring the specific types of social validity measurement described within the literature?

Method

For this review and analysis, the focus was on articles using a single case research (SCRD) published in the journal *Education and Training in Autism and Developmental Disabilities* from 1997–2018. Any article that utilized a SCR D was considered for this analysis regardless of the topic of the study or the population of focus for the study.

Procedures

This study consisted of four phases of analysis. These included the following:

Phase 1: The criteria for inclusion in Phase I of the analysis was articles must be single-case research designs (SCR D) within *ETADD* and was accomplished by identifying and examining the methods utilized within all articles published in *ETADD* from 1997 to 2018. The authors divided the total number of years between them and then each author conducted a hand search of every issue of the journal for the years 1997-2018 for articles that utilized a SCR D. To be considered as single case research, an article had to employ a withdrawal, multiple baseline, changing criteria, or other type of single-case design as described by Alberto and Troutman (2016). The quality of the SCR design was not differentiated based on factors, such as whether determination of a functional relation was possible, number of data points per condition, or number of demonstrations of effect as has been done in some reviews,

such as Ledford et al. (2016). All SCR D articles were included in this review. Articles that were conceptual pieces, used group designs, or were case studies were omitted. The first author reviewed 18 randomly selected issues (20%) as a check for interrater reliability. Agreement was considered when both authors considered an article as utilizing a single case research design or not, and was determined to be 100%.

Phase 2. Phase 2 involved determining the number of SCR D articles that reported social validity. Each article was examined to identify any type of social validity reporting. This was in most cases accomplished quite easily as *ETADD* appeared to require a heading in all articles such as “Social Validity” or “Treatment Acceptability”. The first author reviewed 60 articles considered to contain social validity by the second author as a measure of interrater reliability. Agreement was when both authors considered an article as containing a form of social validity assessment or not, and was determined to be 100%.

Phase 3. In Phase 3, the authors determined the SCR D articles reporting partial construct SV & total construct SV. In order to differentiate between articles reporting partial or total construct SV, the criteria described by Snodgrass et al. (2018) was utilized. For an article to be considered as reporting total construct SV it needed to report on all three components of social validity (goals, treatments, and effects) and it had to analyze the results of the SV assessment using tables, graphs, or quotes, and explain the results in more than two sentences. The same 60 articles from Phase 2 were examined to determine agreement on whether the social validity reported was partial or total construct. The interrater reliability was determined to be 97%.

Phase 4. Once articles were identified as having reported total construct SV, the specific details of what type of measurement was conducted for the goals, treatments, and effects were analyzed using a modified Social Validity Measurement Inventory (SVMI; Carter, 2010). See Table 1 for a copy of the modified SVMI and the operational definitions for the inventory categories. This inventory was initially developed for use in consultation to assist in determining how practitioners or agencies were measuring social validity and to make suggestions about alternative methods for measuring social validity. The SVMI consists of 17 different ways to measure the social validity of treatment goals, 17 different ways to measure the social validity of different treatments, and 17 different ways to measure the social validity of treatment effects. In total, the measure offers 51 different operationally defined ways to measure social validity across goals treatments, and effects which can be tallied to provide a record of how social validity is being measured or could be measured. The inventory was modified by eliminating the bottom row of the inventory which focuses on a projected number of measurements that would be considered to be preferred or valuable. Since the inventory was being used to examine journal articles, these projected number of desirable measurements were deemed more appropriate for consultation activities and not relevant for this type of article review. Exact match interrater agreement for six articles identified as reporting partial construct social validity was 98%. Overall exact match interrater agreement for 10 articles identified as reporting total construct social validity was 90%. The exact match interrater agreement for categories on the SVMI was 91% for goals measurement, 96% for treatment measurement, and 84% for effects measurement (see Table 1).

Results

The examination of all articles published in *ETADD* from 1997-2018 revealed 858 total articles were published during this time period ranging from 31 articles in 2004 to 47 articles in 2011. Out of all the articles, 298 (35%) were determined to utilize a SCR design ranging from 14% in 1997 to 56% in 2014. Of all the articles utilizing a SCR, 138 (46%) reported on social validity. See Figure 1 for total count distribution across years for articles, single case research, and social validity reporting. Reporting of social validity ranged from 0% to 43% among all articles published and from 0% to 100% among SCR articles published. See Figure 2 for the percentage of social validity reporting across years which shows an increase in social validity reporting for five continuous years beginning in 2014. The years 2014-2018 all had a percentage of social validity reporting above 55% for SCR articles whereas 16 out of the 17 previous years had less than 50% reporting of social validity among SCR articles (see Figures 1 & 2).

Of the SCR articles reporting on social validity, 128 (93%) used partial construct social validity and 10 (7%) used total construct social validity. Six articles that represented partial construct social validity were analyzed using the modified SVMI and these were found to focus on consumer acceptability, consumer satisfaction, and overall changes in behavior. The analysis of total construct social validity revealed limited types of measurement variation among the goals, treatment, and effects. See Table 2 for a breakdown of the types of total construct social validity represented within the total construct articles analyzed. The majority of goals measurement involved consumer values and

Table 1. *Modified Social Validity Measurement Inventory (SVMI)*

Goals Measurement	Treatment Measurement	Effects Measurement
Examination of past goals	Consumer knowledge of treatment	Overall change in behavior
Consumer values	Consumer acceptability	Immediacy of behavior change
Consumer preferences	Willingness to implement/Participate	Degree of behavior change
Consumer future plans	Evidence base/reasonableness of Treatment	Consumer satisfaction with effects
Person-centered planning	Functional assessment	Expert recognition of effects
Goodness-of-fit	Treatment integrity	Normative comparison
Consumer expectations	Complexity/Time necessary to implement	Clinical outcomes
Prioritization of goals	Treatment intrusiveness	Influence on Habilitation (self-help, recreation, etc.)
Goal Attainment Scaling	Presence of reinforcement/punishment	Baseline comparison
Potential long-term benefits of goals	Replacement behavior	Peer comparisons
Potential short-term benefits of goals	Presence of coercion	Consumer perceived change in severity of behavior problem
Habilitative potential	Consumer confidence in treatment	Consumer perception of replacement behavior
Consumer confidence in goal achievability	Side effects	Consumer competency with replacement behavior
Comprehensiveness of goals	Abuse potential	Status Level (health, education, social, financial, etc.)
Potential impact of goals on others (family, friends, etc.)	Resources available to support implementation	Impact on others (family, friends etc.)
Potential influence on quality of life	Exposure to treatment/ treatment analysis	Quality of life
Predicted cost-benefit analysis	Consultant experience with treatment	Cost-benefit analysis

Figure 1. Total Counts of Articles, Single Case Research, and Social Validity

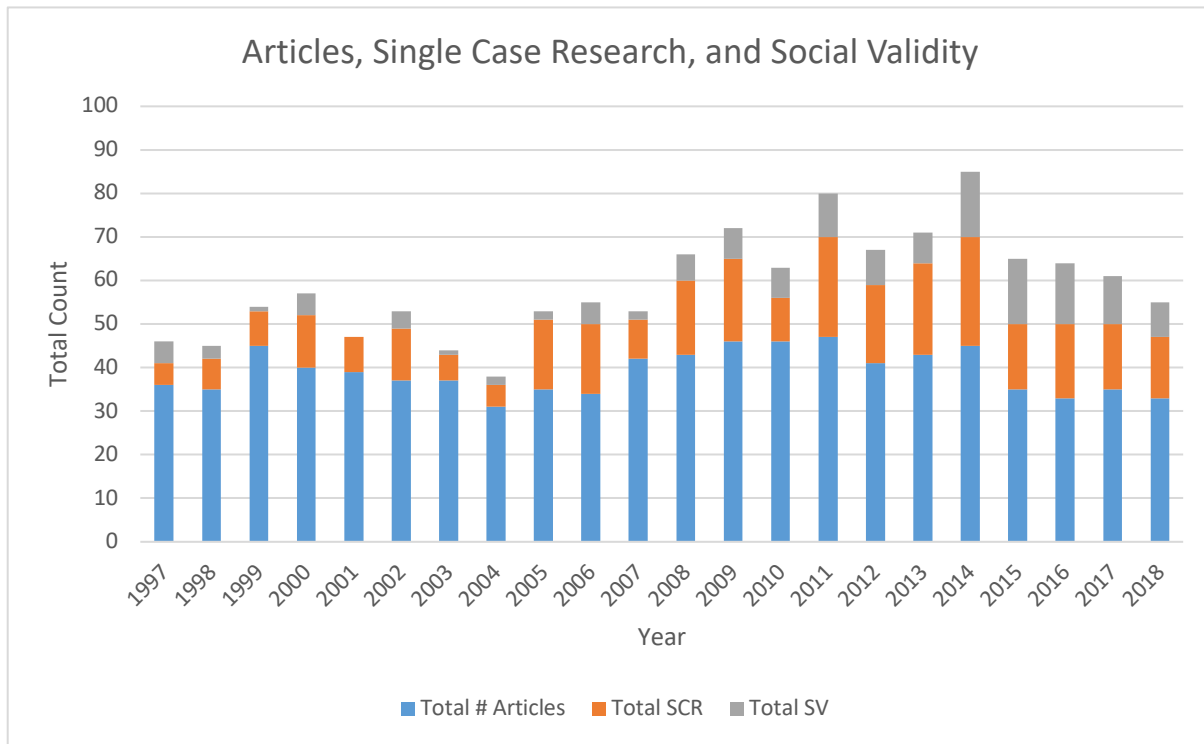
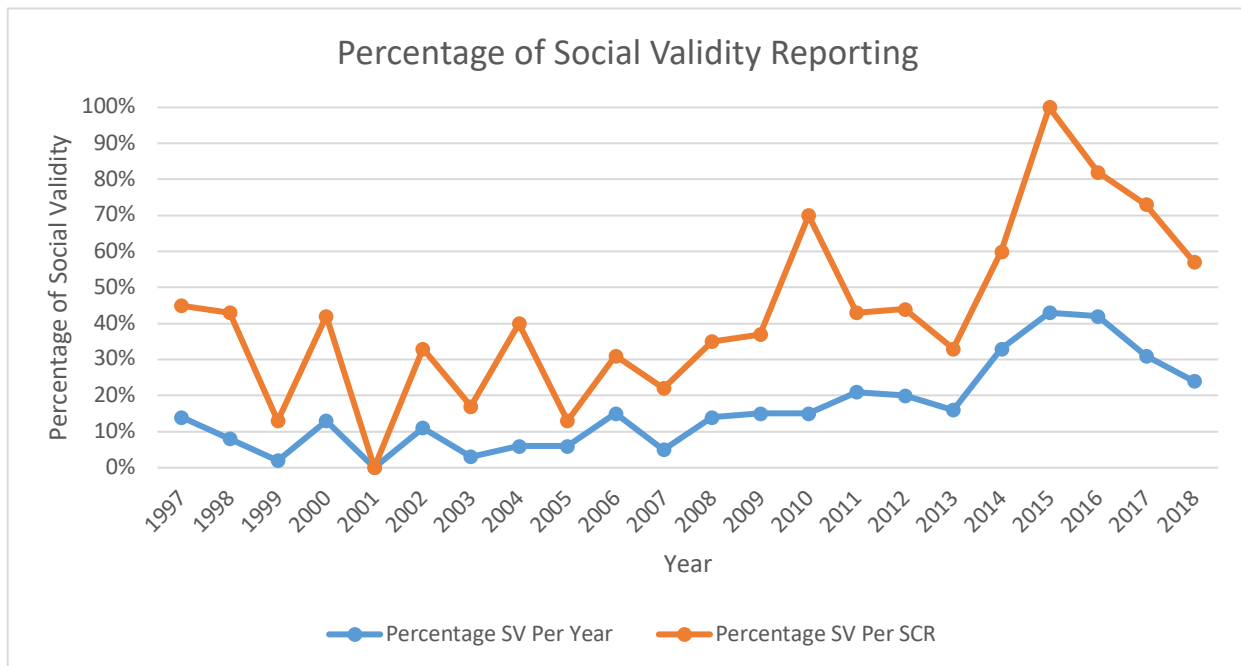


Figure 2. Percentage of Social Validity Reporting



preferences, the majority of treatment measurement focused on treatment acceptability, and the majority of effects measurement included overall changes in the behavior and consumer satisfaction with treatment effects.

Discussion

Paramount in terms of importance to any service driven profession is ensuring that the services provided by professionals are valued by those receiving these services and other stakeholders. As pointed out by Wolf (1978), if service providers do not consider how consumers perceive the services rendered, then these providers may find that consumers go elsewhere.

Although most reviews of social validity in published research indicates infrequent measurement (e.g., Callahan et al., 2017; Ledford et al., 2016; Snodgrass, et al., 2018), the results of this study indicate a recent increase in social validity measurement within the journal *ETADD*. One unique editorial aspect of *ETADD* is that it typically provides a subheading titled “*Social Validity*” where authors of SCRD studies explain the procedures and findings of their social validity measurement. In several other similar journals this type of subheading may not be provided and the discussion of any social validity measurement that occurred may be embedded within the overall narrative which leaves the reader to, in some cases, make an interpretation about what was done to measure or promote social validity of

Table 2. *Percentage of Measurements Utilized in Total Construct Social Validity*

<i>Goals Measurement</i>	
Consumer values	80%
Consumer preferences	60%
Impact of goals on others family, friends, etc.)	20%
Potential influence on quality of life	20%
Goodness-of-fit	10%
Prioritization of goals	10%
Potential long-term benefits of goals	10%
Potential short-term benefits of goals	10%
<i>Treatment Measurement</i>	
Consumer acceptability	100%
Willingness to implement/Participate	30%
Complexity/Time necessary to implement	10%
Consumer confidence in treatment	10%
<i>Effects Measurement</i>	
Overall change in behavior	100%
Consumer satisfaction with effect	100%
Habilitation (self-help, recreation, etc.)	30%
Impact on others (family, friends etc.)	30%
Quality of life	20%
Peer comparisons	20%
Expert recognition of effects	20%
Normative comparison	10%
Consumer perception of replacement behavior	10%
Competency with replacement behavior	10%

the services provided. Overall, *ETADD* published SCRD articles more frequently than most other similar journals (36%). Comparatively, Snodgrass et al. (2018) found over a 12-year period, out of 1022 articles published in *Research in Autism Spectrum Disorders (RASD)*, 166 (16%) were SCRD articles. While the number of articles reviewed are not exact, it appears that *ETADD* publishes twice as many SCRD articles as *RASD*. In addition, Snodgrass et al. (2018) over a 12-year period, found out of 207 SCRD articles published in *Research in Developmental Disabilities (RIDD)*, 21% (44) reported social validity. By comparison, within 298 SCRD articles in *ETADD*, 46% (138) reported on social validity, which is more than double the percentage reported within *RIDD* and similar to the 44% of studies across journals reporting social validity noted by Ledford, et al. (2016). The SCRD articles in *ETADD* report on social validity as well as or more frequently than other similar journals, but as noted by Snodgrass et al., *ETADD* was not among the top six special education journals with the highest 5-year impact factors. Considering that *ETADD* publishes more SCRD articles than any of the six journals reviewed by Snodgrass et al., and as impact factor is determined by the number of times an article is cited, this may indicate that SCRD articles may not be cited as frequently as other types of research articles, thus decreasing the overall impact factor of *ETADD*. As most SCRDs focus on specialized populations where group designs may be less appropriate, the use of these specialized populations may inherently reduce the opportunities for citations and thus depress a journal's impact factor.

As research question one focused on the prevalence of partial and total construct social validity within *ETADD*, it was determined that the SCRD articles in *ETADD*

report on total construct social validity as well as or more frequently than other similar journals (7%). Snodgrass et al. (2018) found total construct reported in 5% of SCRD articles in *RASD*, which is similar to the prevalence of *ETADD*. The relevance of reporting partial or total construct social validity may infer a number of possibilities such the priorities of the researchers, the type of content which was the focus of the research, the availability or willingness of stakeholders to participate at specific times or with specific activities or several other unknown factors. Anecdotally from the current study, it appeared that some researchers were relying on protocols for measuring social validity that they were most familiar with and did not demonstrate much variability in how they carried out their measurements.

Research question two inquired about the specific types of social validity measurement being utilized within articles published in *ETADD*. All of the articles in this study were found to measure consumer acceptability, consumer satisfaction, and overall changes in behavior. This is reflective of the vast majority of research on social validity that focuses on treatment acceptability as numerous scales have been developed to measure acceptability and satisfaction (Carter, 2010). Similarly, goals measurement mostly focused on consumer values and preferences that are commonly included in structured and unstructured interviews. The factor of time and complexity required to implement an intervention that has frequently been found to have influence on treatment acceptability was only measured in 30% of the total construct articles. Most interesting was the low prevalence of measuring influences on habilitation, quality of life, impact on friends and family. In addition, measuring social validity through peer comparison, normative comparison, or expert

recognition had a very low prevalence. The low prevalence of many of these very useful measures of social validity appears to reflect a lack of comprehensiveness of social validity measurement that excludes some very useful types of measurement such as peer comparison or quality of life. While there could be numerous explanations for the low prevalence of some of these types of measures of social validity, there could be influence from factors such as limited experience with certain measures among researchers, bias toward certain measurement procedures among researchers, limitations on sharing individual data with various stakeholders, or trends within the published literature that serve as models for how researchers measure social validity.

Research question three looked into the potential for a reliable instrument for measuring the specific types of social validity measurement described within the literature. The modified version of the SVMII was found to be a reliable instrument for identifying the specific types of measurement used within the articles reviewed for this study. While this modified version of the inventory appears useful to use when reviewing published research, the original SVMII may be more influential toward expanding the types of social validity measures that are used in research. The original inventory was designed to be used by consultants or others as an assessment and planning tool for measuring social validity. Through completion of the inventory, consultants can determine the types of social validity measurement that are occurring and identify and possibly recommend other areas of measurement that may be useful to agencies or individuals. This could assist in expanding the use of underutilized social validity measurement procedures and introduce practitioners to new ways of gathering useful information.

This study includes several limitations such as the review only includes one journal and was only reflective of what was reported in the articles reviewed. Other journals may have a wider representation of types of social validity measures utilized in research. Also, researchers may have in some instances conducted measures of social validity that they did not report on in the published manuscript. This could be because of editorial decisions that limit reporting on all research activities or due to researchers not collecting social validity data, choosing not to report some information, or because they were following some model for preparing a manuscript that did not include detailed information on social validity measurement.

The importance of total construct social validity when designing, delivering and evaluating an intervention cannot be overstated in that it reinforces a person-centered perspective with valued input from consumers throughout the entire process. The ultimate aim of an intervention is to provide a meaningful outcome for the individual for whom it is intended. To further this aim, the importance of having input from the consumer in the formation of treatment goals when possible is apparent. In turn, the positive implications of having consumer input, as per the acceptance of treatment, can help to ensure adherence to the treatment by the individual, as the goal and relevance of treatment are based on consumer input. Designing treatments that are gratifying for the consumer to the greatest extent possible and that minimize intrusiveness are beneficial, but without consumer input this is not likely to result in meaningful outcomes. The outcomes of a treatment must have social relevance for the individual to have true value. Total construct social validity is the most efficacious of practices to be utilized.

This study represents a novel investigation into the specific types of total construct social validity measurement that are utilized within published research. There are currently no other studies that systematically analyze the specific types of social validity measured. While this study is limited in scope, it does address the recommendation by Ledford et al. (2016) to examine the prevalence of specific types of social validity measurement

represented in the literature. In addition, this study offers a reliable method for examining specific types of social validity measurement through the use of the modified SVM. The hope is to influence an expanded view of social validity to include more awareness of the need to examine total construct social validity and to promote the use of a wider range of social validity measurement than is currently being represented in the literature

References

- Alberto, P. A., & Troutman, A. C. (2016). *Applied behavior analysis for teachers* (9th ed.). Columbus, OH: Pearson Merrill Prentice Hall.
- Brosnan, J., & Healy, O. (2011). A review of behavioral interventions for the treatment of aggression in individuals with developmental disabilities. *Research in Developmental Disabilities, 32*, 437-446.
- Callahan, K., Hughes, H. L., Mehta, S., Toussaint, K. A., Nichols, S. M., Ma, P. S., ... Wang, H. T. (2017). Social validity of evidence-based practices and emerging interventions in autism. *Focus on Autism and Other Developmental Disabilities, 32*(3), 188-197.
- Carter, S. L. (2010). *The social validity manual: A guide to subjective evaluation of behavior interventions*. San Diego: Academic Press.
- Carter, S. L. & Wheeler, J. J. (2019). *The social validity manual: Subjective evaluation of Interventions* (2nd ed.). San Diego: Academic Press.
- Horner, R. H., Dunlap, G., Koegel, R. L., Carr, E. G., Sailor, W., Anderson, J., ... O'Neill, R. E. (1990). Toward a technology of "nonaversive" behavioral support. *Journal of the Association for Persons with Severe Handicaps, 15*, 125-132.
- Ledford, J. R., Hall, E., Conder, E., & Lane, J. D. (2016). Research for young children with autism spectrum disorders: Evidence of social and ecological validity. *Topics in Early Childhood Special Education, 35*, 223-233.
- Schwartz, I. S., & Baer, D. M. (1991). Social validity assessments: Is current practice state of the art? *Journal of Applied Behavior Analysis, 24*, 189-204.
- Snodgrass, M. R., Chung, M. Y., Meadan, H., & Halle, J. W. (2018). Social validity in single-case research: A systematic literature review of prevalence and application. *Research in Developmental Disabilities, 74*, 160-173.
- Spear, C. F., Strickland-Cohen, M. K., Romer, N., & Albin, R. W. (2013). An examination of social validity within single-case research with students with emotional and behavioral disorders. *Remedial and Special Education, 34*, 357-370.
- Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis, 11*, 203-214.

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A Decade of Disability Depictions in Newbery Award Books

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Abstract: Newbery awards are conferred annually on books recognized as having made the most distinguished contribution to children's literature; these books reach a wide audience, and their depictions of characters with disabilities can influence children's perceptions and attitudes toward individuals with disabilities. Eight Newbery Medal and Honor books chosen from 2010 to 2019 were identified as portraying 11 main or supporting characters with a disability. Six disabilities were represented: emotional disturbance, deafness, specific learning disability, speech/language impairment, orthopedic impairment, and traumatic brain injury. Applying the Rating Scale for Quality Characterizations of Individuals with Disabilities in Children's Literature, we found most of the characterizations positive in personal portrayal, social interactions, and sibling relationships. Exemplary practices were also found in these books. We encourage school professionals to select books carefully to share with their students.

Today's classrooms are increasingly diverse, including children and youth with a variety of disabilities. In 2016 just over six million students ages 6 to 21 qualified for special education or related services because of their disabilities—9% of the total student population. About 38.6% of these students had a specific learning disability; others were receiving services for difficulties related to autism, intellectual disability, emotional disturbance, orthopedic impairment, or speech or language impairment, among others. These percentages have remained consistent over the past 10 years (U.S. Department of Education [USDE], 2018).

Additionally, the number of students with disabilities who are included for at least 80% of their day in general education classrooms has increased from 57% in 2007 to 63% in 2016 (USDE, 2018). This increased inclusion is intended to enable more social interaction involving students with and without disabilities, providing teachers and other school professionals more opportunities to promote acceptance and inclusion of students with special needs. However, sharing physical space alone will not increase socialization nor positive attitudes (Litvack, Ritchie, & Shore, 2011). One way educators can help students become more aware and accepting of each other is to incorporate

literature that includes characters with and without disabilities into their curriculum.

Character Portrayal

Not all books that include characters with disabilities portray them authentically. For example, some books may include characters whose disabilities are not consistent with symptoms validated by decades of research, or they may portray characters who are dimensionally flat, not fully developed as multifaceted individuals. Authors may emphasize the disorders, disabilities, and dysfunctions of the characters rather than balancing these challenges with their strengths, interests, and abilities. Outdated and discriminatory terms and stereotypes (e.g., *retard*, *handicapped*, *moron*, *suffers from*, *afflicted with*, *confined to a wheelchair*) may implicitly condone such attitudes when referring to individuals with disabilities. Characters with disabilities may be shown as unable to engage in reciprocal relationships: being ridiculed and bullied, feared and rejected, pitied or venerated. Readers may encounter them as excluded from inclusive educational and community opportunities, unable to attain valued occupations, and reliant on others to make their decisions. Their siblings may be characterized as unrealistically positive or traumatically negative. And many of their stories are told by others rather than related in their own voices, ignoring the “nothing about us without us” movement (Charlton, 1998).

Therefore, an analysis of characters with disabilities in books found frequently on library bookshelves, among classroom offerings, in online apps, and in family homes is warranted. Such an analysis can help school teachers, as well as librarians, school psychologists, social workers, and parents, to choose books that portray characters with disabilities in ways that are positive and

inclusive, strengthening their own and their students’ knowledge and respect for these individuals with differences (see Vaz et al., 2015).

Newbery Award

John Newbery, sometimes called “the father of children’s literature,” published over 100 books for children. Honoring him, the John Newbery Medal (often referred to as the “Newbery Award”) is presented annually for “the most distinguished contribution to American literature for children” during its year of eligibility (American Library Association, 2019, para. 1). Newbery books, considered for children up to 14 years old, are selected for their potential to strengthen children’s understandings, appreciations, and abilities (American Library Association, 2019). Books selected as Medal and Honor books are highly publicized, readily available, and frequently used in classrooms; thus they can play influential roles in the thinking of teachers and students.

Many scholars have evaluated Newbery award-winning books based on characteristics including age, family structure, and race/ethnicity, but few studies have analyzed treatment of characters with disabilities (Despain, Tunnell, Wilcox, & Morrison, 2015). A previous study found that portrayal of characters with disabilities has been improving since the Newbery award was initiated in 1922 (Leininger, Dyches, Prater, & Heath, 2010). However, characters with disabilities in Newbery books from the past decade have not yet been evaluated.

Study Purpose

The purpose of the current study has been to analyze the portrayal of main and supporting characters with disabilities in the Newbery Medal and Honor books from 2010 to 2019. Four research questions guided this study:

1. How do literary elements in this sample of books (e.g., characterization, setting, point of view) affect portrayal of characters with various disabilities?
2. Which disabilities are portrayed in this sample of books?
3. How do the books represent characters with disabilities in terms of personal portrayal, social interactions, sibling relationships, and point of view?
4. What exemplary practices are shown benefiting the characters with disabilities?

Method

Book Selection

We reviewed the American Library Association's website for listings of Newbery Medal and Honor books awarded between 2010 and 2019. A juvenile literature librarian with expertise in disability issues and a former Newbery Medal Selection Committee member helped the research team draw the sample of Newbery books within the date range.

Books included in this evaluation had to have one main (protagonist or antagonist) or supporting character (individual with enough presence and impact to warrant characterization) with a disability that would require special education or related services for a child. The guidelines for disabilities included descriptions of all 13 conditions outlined by the Individuals with Disabilities Education Improvement Act (IDEA; 2004). Characters with illness-related impairments (e.g., cancer) and orthopedic impairments (e.g., limp) were included only if the disability appeared to have a significant negative impact on the child's educational progress (e.g., academic performance, social and emotional relationships) or the adult's ability to function in the community (e.g., interpersonal relationships, occupation,

community involvement). Characters were considered in the analysis if they were identified by the author either within the text of the book or in other credible sources (e.g., author's website, publications) as having a disability, or if they had conspicuous characteristics or symptoms aligned with one of the 13 IDEA disabilities though not diagnosed.

Two Medal and six Honor books were found including a total of 11 main or supporting characters with disabilities. Some excellent books were not analyzed because the character with a disability was only incidental to the plot. Table 1 lists the qualifying books with additional information about the characters.

Instrumentation

We used five sections of the Rating Scale for Quality Characterizations of Individuals with Disabilities in Children's Literature (Leininger et al., 2010) to evaluate each Newbery Medal and Honor book character with a disability: personal portrayal, social interactions and relationships, sibling relationships, exemplary practices, and point of view. Each section contains several items rated on a scale including 1 (*disagree*), 2 (*neutral*), and 3 (*agree*).

1. *Personal Portrayal* includes these demographic items: age, gender, race/ethnicity, and disability, as well as whether the individual is a main or supporting character. Six rated items rated focus on accurate and realistic character development, including strengths and abilities as well as challenges, along with similarities to characters without disabilities. Also, non-discriminatory person-first language is important.
2. *Social Interactions and Relationships* as a category involves six items

Table 1. *Newbery Books 2010-2019 Containing Characters with Disabilities*

Title	Award Year	Award	Character (main/supporting)	Age/Grade	IDEA Disability
<i>Brown Girl Dreaming</i>	2015	Honor	Jackie (main)	Birth through elementary school	Specific learning disability
<i>El Deafo</i>	2015	Honor	Cece (main)	Elementary school	Deafness
<i>Hello Universe</i>	2018	Winner	Virgil (main)	11	Specific learning disability
			Valencia (main)	Middle school	Deafness
			Chet (main)	Middle school	Emotional Disturbance
<i>Paperboy</i>	2014	Honor	Victor (main)	11	Speech/language impairment
<i>Three Times Lucky</i>	2013	Honor	Colonel (supporting)	Adult	Traumatic brain injury
<i>The War that Saved My Life</i>	2016	Honor	Ada (main)	10	Orthopedic impairment
<i>When You Reach Me</i>	2010	Winner	“The Laughing Man” (supporting)	Adult	Emotional disturbance
<i>Wolf Hollow</i>	2017	Honor	Toby (main)	Adult	Emotional disturbance
			Betty (main)	14	Emotional disturbance

concerning a variety of relationships (e.g., friends with and without disabilities, parents, paid personnel) emphasizing reciprocal relations, acceptance, empathy (rather than pity), positive social contributions, and respect.

3. *Sibling Relationships* is a section focused on siblings' perspectives, including varieties of emotional experiences, opportunities for growth, reciprocity of the relationship, and responsibilities within the family, along with sibling(s)' awareness of the nature of the disability and its effects on the sibling who lives with it.
4. *Exemplary Practices* evaluates five items focused on integrated citizenship, appropriate services, valued occupations, self-determination, and congruence of attitudes and practices with time periods represented.
5. *Point of View* involves two aspects: (a) whose point of view is represented (a character with or without a disability, a narrator), and (b) whether the point of view is realistic.

Data Analysis

Two researchers independently read and evaluated each book according to the rating scale; initial inter-rater agreement was 83.6%. The readers then met and came to agreement on each rating, for a final inter-rater agreement of 100%. They considered books portraying an earlier time period in terms of current standards of nondiscriminatory language, person-first language, and disability description. They evaluated point of view emphasizing whether the voices of characters with disabilities were represented accurately as their experiences were described.

The wide variety in characters with disabilities required that several approaches be applied for disability categorization: (a) when available, authors' explicit identification within the text (e.g., disability labels, reference to special education and related services, visible characteristics), (b) characters' conspicuous behaviors congruent with one of IDEA's 13 disability categories (e.g., extreme withdrawal from or desire to harm other people), (c) characters' thoughts or motivations revealed in the text (e.g., extreme or extraordinary fear, anger, resentment). Some characters portrayed with disabilities are adults whose behavior (both positive and negative) affects children.

To determine the valence of the depictions of characters with disabilities and practices affecting them, a cut-off score was determined. The average ratings between the two readers were calculated to determine a negative, neutral, or positive score (scale 1, 2, 3). Scores in the range of 1.0-1.66 were considered negative, scores in the range of 1.67-2.32 were ranked neutral, and scores in the range of 2.33-3.0 indicated positive practices and portrayals.

Results

Literary Elements

Of the 10 Newbery Medal and 30 Honor books awarded within the past decade, eight books (20%) include main and/or supporting characters with disabilities whose presence impacts the plot. Of the 11 characters in these books with disabilities, nine are main and two are supporting. Two books (25%) received the Newbery Medal and six (75%) were granted a Newbery Honor.

Most of the books are set entirely in the past ($n = 6$, 75%) and therefore include disability portrayals and language consistent with those settings. *The War that Saved My Life* (Bradley, 2016) takes place during World

War II, when 10-year-old Ada's "clubfoot" was regarded as a source of shame and reason for isolation and secrecy in London, where at the beginning of the novel she lives with her mother and younger brother, Jamie. The accuracy of the book's portrayal of this orthopedic impairment was evaluated in terms of current understanding, although the ignorance and prejudice in the setting were upheld as necessary. Language in all books was evaluated using modern-day standards. Thus epithets like "retard" and "retardo," as used by vicious bully Chet in *Hello Universe* (Kelly, 2018), were considered negatively. Similarly, a negative rating was given for the vicious comment of Ada's mother in *The War that Saved My Life*, "I got stuck with a cripple" (Bradley, 2016, p. 306). Cece, a bunny who is deaf, names herself "El Deafo" (Bell, 2014) to represent her superpower persona, an empowering rather than disparaging characteristic.

Half of the books ($n = 4$, 50%) are from the point of view of the character with the disability: Jackie in *Brown Girl Dreaming* (Woodson, 2014), Cece in *El Deafo* (Bell, 2014), Victor in *Paperboy* (Vawter, 2013), Ada in *The War that Saved My Life* (Bradley, 2016). All are detailed, sensitive, and personal.

Jackie's first-person account of her learning disability in *Brown Girl Dreaming* (Woodson, 2014) is honest and powerful, as she compares her first-grade self to her sister, who is recognized as "brilliant" and "gifted":

I am not gifted.
When I read, the words twist
twirl across the page.
When they settle, it is too late.
The class has already moved on.

I want to catch words one day.
I want to hold them
then blow gently,

watch them float
right out of my hands.
(Woodson, 2014, p. 169)

The personal depth and individuality as well as the moving poetry in which the book is written are stunning evidence that a learning disability does not preclude brilliance or giftedness. Jackie's voice is unforgettable.

Stories told from others' perspectives are also sensitive and authentic. *Wolf Hollow* (Wolk, 2016) in the voice of elementary student Annabelle, describes her encounters, fears, conflicts, and relationships with two individuals with disabilities: Toby, a war veteran whose post-traumatic stress disorder (PTSD) results in emotional disturbance and troubling behavior, and Betty, an older student whose all-consuming emotional bitterness drives her to injure fellow students (one very seriously) and cause two deaths. In *Three Times Lucky* (Turnage, 2012), a girl named Moses narrates a complex story involving her guardian, "the Colonel," whose amnesia seems to result from brain injury due to an automobile accident.

Types of Disabilities Portrayed

Eleven characters in the selected books represent six different disabilities. Emotional disturbance is most prevalent (36%; $n = 4$). Toby in *Wolf Hollow* (Wolk, 2016) suffers from post-battle PTSD resulting in isolation and bizarre behavior. Chet in *Hello Universe* (Kelly, 2017) and Betty in *Wolf Hollow* (Wolk, 2016), though not diagnosed in the texts, have been identified in the study with characteristics related to emotional/behavioral disturbance due to persistent extreme harmful intentions and behavior. Betty's deliberate violent acts injure and kill. Chet's twisted background and malignant thoughts are revealed in chapters where he is the focus character as well as in his abuse of fellow students. "The

Laughing Man” is a supporting character, isolated from others in *When You Reach Me* (Stead, 2010). Deafness is clearly represented by Cece in *El Deafo* (Bell, 2014) and Valencia in *Hello Universe* (Kelly, 2017). Specific learning disability is portrayed by Jackie in *Brown Girl Dreaming* (Woodson, 2014) and Virgil in *Hello Universe* (Kelly, 2017). Other disabilities are orthopedic impairment portrayed in Ada in *The War that Saved My Life* (Bradley, 2015), speech impairment shown in Victor in *Paperboy* (Vawter, 2013), and traumatic brain injury involved with “the Colonel” in *Three Times Lucky* (Turnage, 2012). Figure 1 shows the percentages of disabilities experienced by the main and supporting characters in these Newbery books.

Representation of Characters with Disabilities

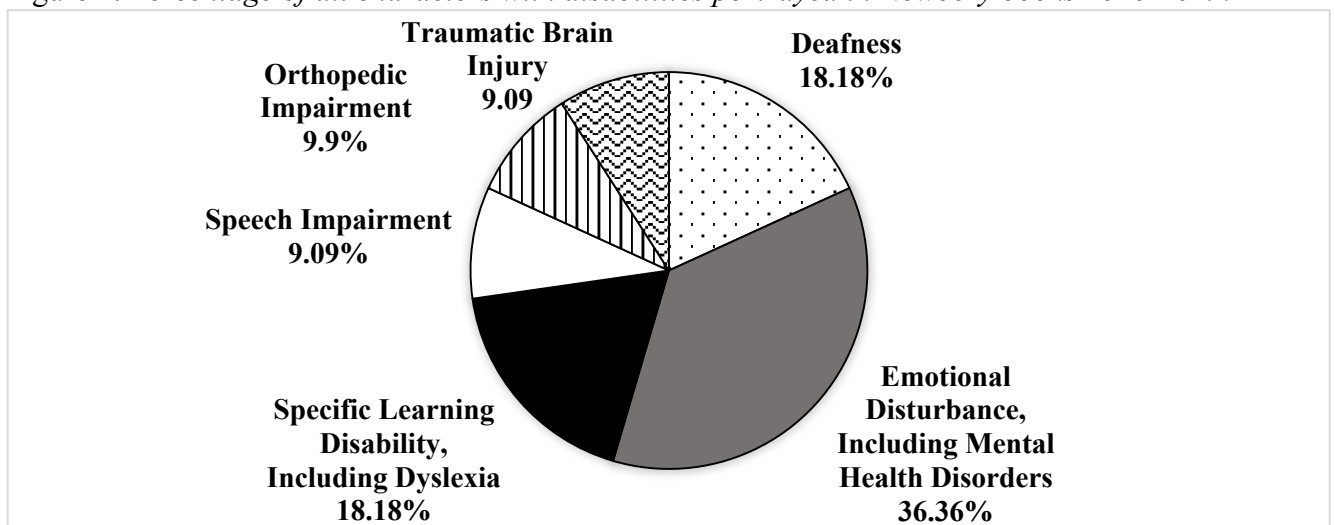
Personal portrayal. Age, gender, and race/ethnicity were the demographics analyzed. Of the 11 characters with disabilities in the Newbery books, six are male (55%) and five (45%) are female. Eight of these characters are children or adolescents (73%); three are adults (27%). Eight of the characters are White, one is Filipino (Virgil in *Hello Universe*, Kelly,

2017), one is African American (Jackie in *Brown Girl Dreaming*, Woodson, 2014), and one, Cece in the graphic novel *El Deafo* (Bell, 2014), is an anthropomorphic bunny. Other ethnicities are not represented in these books.

Eight of the 11 selected characters were rated positive for personal portrayal (73%): (a) Their disability characteristics are portrayed accurately and realistically, (b) they are fully developed, displaying their strengths, interests, and abilities along with their challenges, with emphasis on similarities with peers rather than differences, and (c) non-discriminatory language is used. The average personal portrayal rating of all characters was 2.64 ($n = 11$).

Ada in *The War that Saved My Life* (Bradley, 2016) exemplifies portrayal of a positive character in negative situations. Born with talipes equinovarus (clubfoot), Ada has been imprisoned by an angry belittling mother for her first 10 years, never leaving their small apartment. Her saved life begins as she slips into a crowd of children, including her brother Jamie, who are being evacuated from London to escape bombing raids of World War II. Ada and Jamie are taken in by a

Figure 1. Percentage of all characters with disabilities portrayed in Newbery books 2010-2019.



woman who has almost as many uncertainties and insecurities as they have. The three bond through feeling their way along together, finding themselves as strong, capable, loving individuals. The circumstances are not positive, but the main characters are.

Social interactions and relationships.

Seven of the eleven characters with disabilities (64%) were rated as having positive social interaction scores. The characterizations with negative or neutral scores were all of individuals with emotional disturbance. The average rating for social relationships among the analyzed Newbery characters was 2.4.

Victor's socialization in *Paperboy* (Vawter, 2013), is a moving positive example. As portrayed by Vince Vawter, who lived it, the process is deep, sincere, and effortful. The 11-year-old boy, struggles with a persistent stutter, constantly fearful but applying everything his therapist teaches him. As he spends a month as a substitute paperboy, his various clients, as well as his caretaker, his father, and his best friend, do everything they can to help him communicate with them and gain some of the self-confidence he desperately needs.

Another positive example is “the Colonel” in *Three Times Lucky* (Turnage, 2012), who has lost his memory from a traumatic head injury and is so well liked in his small town that he missed being elected mayor by one vote—and he wasn't even running. Also a few “misfits” in *Hello Universe* (Kelly, 2017) connect with each other in solid friendship as they embark on a quest to find their friend, Virgil, who is missing.

The most negatively portrayed character in the books described, Betty in *Wolf Hollow* (Wolk, 2016), seems to have two dimensions: miserable and mean. At age 14 Betty has

been sent to live with her grandparents because she is “incorrigible.” Betty’s single motivation seems to be to cause others pain, and she is clever and manipulative as she entraps and injures school children and eventually adults. Toby, whose post-war PTSD causes him to behave strangely and avoid social contact, intervenes to rescue children Betty has injured and becomes the focus of her hatred. Her scheming lies and deception destroy them both. The contrast between innocent confusion and purposeful malice brings new understanding to tragic social-moral interrelationships.

Portrayal of sibling relationships. Siblings of four characters with disabilities (36%) are portrayed in the books examined; in two books siblings are critical to the plot, in two they are part of the background affecting the individual with the disability, with little development as individuals. The average rating for sibling relationships was 2.4. All of these relationships were rated positive, but only two of these books include siblings who are developed as independent characters: Ada’s brother, Jamie, in *The War that Saved My Life* (Bradley, 2016) and Jackie’s siblings, Hope, Del, and Roman, in *Brown Girl Dreaming* (Woodson, 2014). These siblings appear to experience a range of emotions, have opportunities for growth, engage in reciprocal relationships with the family member with the disability, are not unduly burdened with caregiving and other household duties, and are aware of the disability and its effects (Meyer & Holl, 2014; Meyer & Vadasy, 2008). Ada in *The War that Saved My Life* (Bradley, 2016) and her brother, Jamie, flee the figurative as well as literal destruction threatening their London home and struggle together with fears, misunderstandings, frustrations, pain, hopes, hopelessness, and ultimately love and joy. Both learn to accept each other, caring outsiders, and most importantly,

themselves. In *Brown Girl Dreaming* (Woodson, 2014), Jackie recounts her family's history from the American civil war era through her own infancy, childhood, and elementary years. Her two brothers and sister--each with his or her own individual outlook, interests, opinions, and talents--are beside her interacting with her and other family members throughout the extensive, detailed, and beautifully rendered memoir.

Portrayal of Exemplary Practices

The study examined exemplary practices regarding individuals with disabilities related to integrated citizenship, appropriate services, valued occupations, self-determination (Turnbull, Turnbull, Wehmeyer, & Shogren, 2016), and congruence of attitudes and practices with time periods represented. Six of the characters with disabilities (55%) were rated as experiencing positive standards of exemplary practices. The average portrayal of exemplary practices was a rating of 2.5.

A positive example of exemplary practices is found in the opportunities offered to Cece, the protagonist in *El Deafo*, a story based on the author's childhood, which takes place in the mid-1970s (Bell, 2014). Cece, a bunny with big ears but is deaf, is eventually given an effective hearing aid to help her in school and at home. Earlier ineffective devices are represented in bold print as this graphic novel portrays what Cece actually hears. She learns to lip read after a fashion to supplement what she can access through the hearing devices. She is invited to learn American Sign Language, but she rejects this offer. As Cece advances through school and technology advances with scientific progress, she is fitted with more advanced equipment. The teachers are instructed on how to use the various technologies in the classroom to help her. They cooperate well, although there are mishaps when her gym teacher breaks her

hearing aid and when her teachers forget to remove their microphone and she can hear them in the lounge and in the bathroom. Cece's accommodations also provide times of angst with her peers as she tries desperately to find a best friend. As she navigates a variety of peer personalities, from bossy to aggressive, many clearly do not understand her needs.

In *Hello Universe* (Kelly, 2017), Virgil, a shy, quiet boy with a specific learning disability in mathematics, and Valencia, a girl with deafness who is struggling socially, both receive support every Thursday from their teachers in the resource program at their middle school. Virgil's teacher communicates with his parents concerning his specific needs in what might be interpreted as an equivalent of an IEP meeting. But as in *El Deafo* peer interactions are not as positive. The bullying and name-calling are disappointing, but sadly realistic. The portrayal of the character with disabilities in *When You Reach Me* (Stead, 2009) was not rated acceptable. The homeless Laughing Man, who has emotional disturbance, is feared in the community and receives no support.

Discussion

Literary Elements

The intent of this study was to analyze Newbery winning books from the past decade that include main or supporting characters with a disability. This section includes a discussion of the results in comparison to an earlier study, limitations of the study, and recommendations for practice and further research.

Of the 40 books given the Newbery Medal or Honor within the past decade, 23% include main and/or supporting characters with disabilities. This is similar to the percentage of Newbery books awarded during the time

period following the passage of the Education for All Handicapped Children Act in 1975 until 2009. In that sample of 131 books, 24% ($n=31$) include characters with a wide range of disabilities (Leininger et al., 2010), with the majority of characters having emotional disturbance and orthopedic impairments. The previous study also included characters with intellectual disabilities and autism, disabilities that are not represented in the current sample of books, which is notable considering the increased attention given to autism by TV, movies, and other media during the past decade (see Nordahl-Hansen, Øien, & Fletcher-Watson, 2018).

The percentage of accounts written from the point of view of an individual with a disability have increased since the analysis of books from 1975 to 2009, in which only 13% of the Newbery books had this close personal voice (Leininger et al., 2010). The increase to half of all books in the current sample demonstrates that such individuals are being given voices and do not have to rely on others telling their stories.

Representation of Characters with Disabilities

The depicted personal portrayal, social interactions, sibling relationships, and exemplary practices in the Newbery books are positive and either consistent with or improving on an analysis from an earlier study (Leininger et al., 2010). Considering only the books awarded the Newbery Medal or Honor between 1991 and 2009, personal portrayal and sibling relationships showed an increase in average ratings: from 2.5 to 2.64 and 2.4 to 2.6, respectively. Ratings remained the same for social interaction (2.4) and exemplary practices (2.5) over these two time periods.

It seems surprising that the way characters with disabilities are portrayed in the current sample of books is not distinctly more positive than portrayals in the 1991-2009 sample. However, the current study is limited to 11 characters, whereas the previous sample included 28 characters in its ratings.

Limitations

In addition to the limitation of the number of books analyzed in this study, other limitations should be noted. Possibly not all characters with disabilities in the Newbery books awarded between 2010 and 2019 were identified for analysis. One of the books recommended for the study, *Dead End in Norvelt*, the 2012 Newbery Award winning autobiographical work by Jack Gantos (2011), was excluded because of insufficient evidence of disability. Gantos might have been intending to portray attention deficit hyperactivity disorder and/or dyslexia, but he presented neither disorder so it could be identified. An Honor book from 2019, *The Book of Boy*, by Catherine Gilbert Murdock, was not included because the hump on Boy's back appeared to cause no physical limitations. The picture book *Last Stop on Market Street*, by Matt de la Peña (2016), includes both a blind man and a man in a wheelchair, but neither of these characters is developed sufficiently to be analyzed.

Another consideration is that the criteria for identifying characters with disabilities in Newbery books in this study were set by the authors and not validated in other studies. Additional researchers might have identified more or fewer characters, particularly with disabilities with characteristics that are more intangible or less conspicuous. Finally, only two researchers evaluated each Newbery book. Future studies could employ more trained evaluators to gain a broader perspective on the character depictions.

Implications for Practice and Research

While not a substitute to interacting directly with individuals with disabilities, Newbery books can be used by parents as well as practitioners such as school teachers, school psychologists, social workers, and librarians to help promote acceptance and inclusion in the classroom and community. However, practitioners must be competent and knowledgeable about these disabilities in order to avoid reinforcing stereotypes and stigma (Nordahl-Hansen et al., 2018). For example, the use of derogatory epithets found in some of these books may lead children to believe such use is acceptable unless a parent or practitioner teaches them otherwise. Myers and Bersani's 2008 easy-to-use guidelines for analyzing children's books for ableism, although a decade old, is still relevant and helpful to those seeking books with authentic and inclusive representations.

The results of this study indicated that characters with emotional disorders were frequently portrayed negatively, in contrast to the characters with other disabilities, mirroring the poor outcomes of students with emotional and behavioral disorders in U. S. schools (Kern, 2015). They were typically not the type of individual their peers would want to befriend. Negative portrayals of individuals with emotional or behavioral disorders in children's literature are likely to strengthen negative stereotypes and fear—particularly with bullies like Betty and Chet as portrayed in the books discussed in this article. Often bullies who exhibit the “Three P's of Bullying”—power, pain, and persistence (see Heath, Dyches, & Prater, 2013)—have flat portrayals. Authors are encouraged to develop characters—particularly bullies with severe behavioral challenges—as multidimensional and non-stereotypic. For example, if Betty had been portrayed as sensitive and troubled by her lack of supportive family and inability to

make friends instead of as hostile and destructive, readers might have been led to consider softer sides to bullies who confront them.

Students with disabilities may be drawn to this sample of books by seeing themselves in some of these characters, increasing their reflection and insight. Particularly useful is the increase in books told from the perspectives of characters with disabilities, demonstrating that they can be their own “causal agent” to make self-determined decisions for their lives when they are given appropriate support (Shogren, Wehmeyer, Palmer, Forber-Pratt, Little, & Lopez, 2015; Wehmeyer, 2015). The listed discussion questions may help facilitate greater acceptance and inclusion of individuals with disabilities by their family members and peers (see Table 2).

Future studies could examine characters with disabilities in Newbery Award and Honor books from the inception of the award in 1922 until present to identify trends and improvements over time. Also studies could compare the depictions of characters with disabilities in Newbery books to characters with disabilities in books recognized by other awards, such as the American Library Association's *Schneider Family Book Award* or the Council for Exceptional Children's Division on Autism and Developmental Disabilities' *Dolly Gray Children's Literature Award*.

Conclusion

Children and adolescents can be deeply affected by what they read. Impressions from characters both like and unlike themselves remain—consciously or subconsciously—to affect their thinking and behavior. Like meeting new friends, these characters share places, events, conditions, and experiences that many students may not

encounter themselves. Books that have received Newbery acclaim have been evaluated by experts as being the best that American authors and publishers have to offer. Educators who are aware of the nature

and potentials of Newbery books can use them to help students decrease the *us-them* divide that is prevalent in our society.

Table 2. *Discussion Questions for Newbery Books with Characters with Disabilities, 2010-2019*

Book Title	Suggested Discussion Questions
<i>Brown Girl Dreaming</i>	What do you think Jackie means when she says “the words twist twirl across the page”? What can we do when a classmate reads slowly?
<i>El Deafo</i>	Why is Cece portrayed in some of the graphics with a bubble around her? What can we do to help people with deafness or hearing impairments feel included?
<i>Hello Universe</i>	Why was Virgil such an easy target for Chet? What can we do to prevent or stop bullying at school? Why is it hurtful to call someone a “retard”?
<i>Paperboy</i>	What did the characters in the story do to help Victor feel less embarrassed about his stuttering? How can we include people who have speech difficulties?
<i>Three Times Lucky</i>	Why was Colonel unable to remember his past? Do you know anyone with memory problems? What can we do to be considerate of people with memory problems?
<i>The War that Saved My Life</i>	What prevented Ada from going to school in London? What can we do to help people with physical disabilities feel more confident and included?
<i>When You Reach Me</i>	What caused the Laughing Man to act so different from everyone else? What does learning about him teach us about treating people with difficulties due to past experiences?
<i>Wolf Hollow</i>	Why did Toby act in ways that other people considered strange, disturbed, or even dangerous? What good things did Toby do for those who were friendly with him?

References

American Library Association, (2019). *Newbery medal and honor books. 1922-present*. Retrieved from <http://www.ala.org/alsc/awardsgrants/bookmedia/newberymedal/newberymedal>

- Bell, C. (2014). *El Deafo*. New York, NY: Amulet Books.
- Bradley, K. B. (2016). *The war that saved my life*. London, England: Puffin Books.
- Charlton, J. I. (1998). *Nothing about us without us*. Berkeley, CA: University of California Press.
- De la Peña, M. (2015). *Last stop on Market Street*. New York, NY: G. P. Putnam's Sons.
- Despain, S. M., Tunnell, M. O., Wilcox, B., & Morrison, T. G. (2015). Investigating shifts in diverse family structures in Newbery award and honor books utilizing U.S. Census data, 1930-2010. *Literacy Research and Instruction*, *54*, 316-340.
doi:10.1080/19388071.2015.1061072
- Education for All Handicapped Children Act of 1975, 20 U.S.C. § 1401 *et seq.*
- Gantos, J. (2011). *Dead end in Norvelt*. New York, NY: Farrer Straus Giroux.
- Heath, M. A., Dyches, T. T., & Prater, M. A. (2013). *Classroom bullying prevention: Pre-K-4th Grade*. Santa Barbara, CA: Linworth.
- Individuals with Disabilities Education Act of 2004, 20 U.S.C. § 1400.
- Kelly, E. E. (2017). *Hello universe*. New York, NY: Greenwillow Books.
- Kern, L. (2015). Addressing the needs of students with social, emotional, and behavioral problems: Reflections and visions. *Remedial and Special Education*, *36*(1), 24-27.
- Leininger, M., Dyches, T. T., Prater, M. A., & Heath, M. A. (2010). Newbery award winning books 1975-2009: How do they portray disabilities? *Education and Training in Autism and Developmental Disabilities*, *45*, 583-596.
- Litvack, M. S., Ritchie, K. C., & Shore, B. M. (2011). High- and average-achieving students' perceptions of disabilities and of students with disabilities in inclusive classrooms. *Exceptional Children*, *77*(4), 474-487.
- Meyer, D. J., & Holl, E. (2014). *The sibling survival guide*. Bethesda, MD: Woodbine House Inc.
- Meyer, D., & Vadasy, P. (2008). *Sibshops: Workshops for siblings of children with special needs* (Rev. ed). Baltimore, MD: Paul H. Brookes.
- Murdock, C. G. (2018). *The book of boy*. New York, NY: HarperCollins.
- Myers, C., & Bersani, H., Jr. (2008/2009). Ten quick ways to analyze children's books for ableism. Prejudice by able-bodied and able-minded people toward people with disabilities. *Rethinking Schools*, *23*(2), 52-54.
- Nordahl-Hansen, A., Øien, R. A., & Fletcher-Watson, S. (2018). Pros and cons of character portrayals of autism on TV and film. *Journal of Autism and Developmental Disorders*, *48*, 635-636. doi: [10.1007/s10803-017-3390-z](https://doi.org/10.1007/s10803-017-3390-z)
- Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Forber-Pratt, A. J., Little, T. J., & Lopez, S. (2015). Causal agency theory: Reconceptualizing a functional model of self-determination. *Education and Training in Autism and Developmental Disabilities*, *50*, 251-263.
- Stead, R. (2009). *When you reach me*. New York, NY: Wendy Lamb Books.
- Turnbull, A., Turnbull, R., Wehmeyer, M. L., & Shogren, K. A. (2016). *Exceptional lives: Special education in today's schools* (8th ed.). Upper Saddle River, NJ: Pearson.
- Turnage, S. (2012). *Three times lucky*. New York, NY: Dial Books for Young Readers.
- U. S. Department of Education. (2018). *40th annual report to Congress on the implementation of the Individuals with Disabilities Education Act, 2018*. Washington, DC: Author.
- Vawter, V. (2013). *Paperboy*. New York, NY: Random House.

- Vaz, S., Wilson, N., Falkmer, M., Sim, A., Scott, M., Cordier, R., & Falkmer, T. (2015). Factors associated with primary school teachers' attitudes towards the inclusion of students with disabilities. *PLoS ONE*, *10*. doi: 10.1371/journal.pone.0137002
- Wehmeyer, M. L. (2015). Framing the future: Self-determination. *Remedial and Special Education*, *36*(1), 20-23.
- Wolk, L. (2016). *Wolf hollow*. New York, NY: Puffin Books.
- Woodson, J. (2014). *Brown girl dreaming*. New York, NY: Nancy Paulsen Books.

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Literacy Instruction for Students with Autism Spectrum Disorder in Inclusive Settings

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Abstract: Strategies for supporting the large number of students with autism spectrum disorder (ASD) in the area of literacy within the general education classroom are presented using a multi-tiered system of supports model. Over 20 research-based strategies and supports are categorized as either differentiated, targeted, or intensive, according to the purpose of the support and level of staffing required for implementation. These strategies address the needs of students with ASD in the areas of reading comprehension and written expression. Student engagement, collaboration, and the use of technology emerge as important themes in the successful inclusion of students with ASD.

In the United States, nearly 40% of students receiving special educational services under the IDEA category of autism are placed in general education (GE) settings for more than 80% of the school day (U.S. Department of Education, 2016), with the expectation they will access content in core academic subjects. Students with autism spectrum disorder (ASD) may be placed in GE settings which are either co-taught, have push-in services or pull-out services. Alternatively, they may be placed in a GE setting which is taught solely by a GE teacher, with or without a paraprofessional. Placement in the general education classroom is usually considered to be the least restrictive placement, as “children with disabilities . . . are educated with children who are not disabled (IDEA, 2004).” In order to meet the standard of a free appropriate public education, students with an Individualized Education Program (IEP) must receive appropriate supplementary aids and services. In the GE classroom, the teacher: student ratio is much lower than the ratio in most self-contained classrooms. Students share common learning objectives that are aligned to grade level standards. They are expected to attend to a common set of

directions, interact meaningfully with peers, and complete assignments independently. Although many definitions of inclusion exist, it is commonly understood to refer to an environment in which students with disabilities learn alongside their non-disabled peers to facilitate their “presence, participation, acceptance, and achievement (Humphrey, 2008, p. 41).” This parallels the IDEA definition of least restrictive environment. Individual states may have their own designation for how services might be delivered in the general education classroom, e.g., New York provides integrated co-teaching services, however any general education classroom could be considered an inclusive setting.

Placement in an inclusive setting for all or part of the day exposes students with ASD to the GE curriculum. It allows them to be included in everyday school events, and to participate in the same activities as their peers. Although placement in the GE classroom has many academic and social benefits for students with ASD, it can also be very challenging for teachers to meet expectations. Several factors have a bearing

on the successful inclusion of students with ASD including (a) teaching style, (b) teacher work demands, (c) student engagement, (d) teacher attitudes, and (e) teacher understanding of the needs of students with ASD. In regard to teaching style, GE teachers tend to employ whole class teacher-led instruction (Scruggs & Mastropieri, 1996). Their strengths lie in questioning techniques, providing alternative explanations and examples, as well as classroom management (Wangsgard & Cordon, 2018). These strengths counter recommended practices for student with ASD which often require individualized one-on-one or small group instruction (Crosland & Dunlap, 2012). Faced with recommendations to implement individualized strategies, GE teachers find themselves challenged to select from a smorgasbord of research-based strategies to meet the needs of all their students with disabilities, with no real guidelines on how to implement these strategies in the GE classroom. GE teachers find the constant need to adapt and change their lesson plans this way extremely time-consuming and demanding. In addition, GE teachers struggle to engage students with ASD because they do not know how to help those students participate through peer-to-peer interaction (Wangsgard & Cordon, 2018). In English Language Arts, teachers are concerned students with ASD may not participate fully because they are not able to understand the perspectives of others (Humphrey, 2008).

GE teachers as a group have less knowledge about the needs of students with ASD than their special education counterparts (Segall & Campbell, 2012). They also lack knowledge on how to access professional resources and support for those students (Leblanc, Richardson, & Burns, 2009). Conversely GE teachers with increased training and experience in ASD demonstrate more favorable attitudes towards implementing

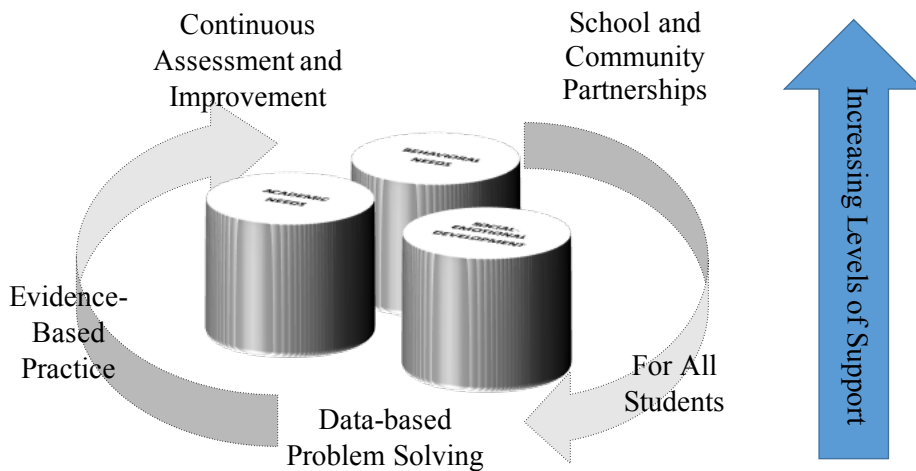
research-based practices in their classrooms (Segall & Campbell, 2012). Effective training is one way to improve GE teachers understanding of students with ASD. Yet, GE teachers still require a manageable framework that provides guidance on how to implement those practices.

In order to meet the various learning needs of students, including students with ASD, in inclusive classrooms, teachers require a framework that is both familiar and flexible. A multi-tiered systems of support (MTSS) model provides a clear framework which draws upon GE teachers strengths in classroom management to implement research-based practices in an organized, systematic manner. MTSS is flexible, in that many kinds of supports (academic, social-emotional, and behavioral) can be implemented (Figure 1). It is also flexible, in that it enables GE teachers to identify interventions which not only meet the needs of students with ASD, but meet the needs of other students in the class as well.

Literacy Development in Students with ASD

Emergent literacy skills. Young children with ASD have strengths in discrete skills such as letter identification (Dynea, Lawton, Logan & Justice, 2014; Lanter, Freeman, & Dove, 2012), but compared to their peers showed weaknesses in meaning-related activities such as print knowledge, definitional vocabulary, and phonological awareness (Dynea et al., 2014; Westerveld et al., 2017). Studies have shown mixed results for print interest (Dynea et al., 2014; Lanter et al., 2012). This is concerning since the National Early Literacy Panel (Lonigan & Shanahan, 2009) presented strong evidence that alphabet knowledge, phonological awareness, rapid naming tasks, and ‘pretend’ writing in young children were predictors of later success in reading and writing.

Figure 1. *Models of Multi-tiered Levels of Support*



Parents of children with ASD have generally agreed reading to their children is beneficial, but indicated their children spend less time in shared book reading (Dynea et al., 2014; Lanter et al., 2012). Studies indicated children with ASD were less likely to ask for help, ask to be read to, or attempt to write. These findings are consistent with diagnostic criteria for ASD related to socio-emotional reciprocity (APA, 2013).

Reading. Commensurate with findings in emergent literacy, studies have shown individuals with ASD continue to demonstrate relative strengths in decoding as they get older. Nation, Clarke, Wright, & Williams (2006) reported reading comprehension in individuals with ASD was weak even when reading accuracy was normative. Despite relative strengths in decoding, when compared to their typically developing peers, individuals with ASD demonstrated mild deficits in semantic vocabulary knowledge (Brown, Oram-Cardy, & Johnson, 2013).

It is not clear how differences in social-communication and social cognition impact reading comprehension in individuals with ASD, but meta-analysis revealed individuals with ASD had more difficulty understanding texts that required background knowledge of the social world (Brown et al., 2013). In addition the ability to integrate specific information with the global meaning of a text may be particularly challenging to individuals with ASD (Saldaña & Frith, 2007). It should be noted reading comprehension in individuals with ASD is correlated with verbal ability.

Writing. Meta-analysis (Finnegan & Accardo, 2018) of writing skills found handwriting of individuals with ASD is larger than the handwriting of typically developing peers. Individuals with ASD also scored lower on measures of legibility and spelling. Compared to TD peers, individuals with ASD wrote at a slower rate and wrote less. Content scores assessed on rubrics were significantly lower.

Multi-Tiered Systems of Support (MTSS) Model

MTSS is a school-wide application of tiered systems of support in at least three areas; academic, behavioral, and social-emotional development as illustrated in Figure 1. It has roots in Response to Intervention (RtI) and Positive Behavioral Support (PBS), but is more universal in its approach. Oftentimes MTSS is used as an umbrella term under which RtI and PBS fall (Gamm et al., 2012). MTSS aims to provide appropriate levels of instruction and intervention on a continuum of increasing intensity for all students regardless of their background, characteristics, or achievement. Evidence-based or research-based interventions are considered appropriate. Since it is school-wide, a collaborative, data-based problem-solving approach to meeting the students' needs is essential. In order to be effective it requires the participation of community members including parents, caregivers, and administrators in continuous assessment and improvement.

MTSS differs from RtI in its school-wide approach and inclusion of all students. In contrast RtI has its roots in special education and identification of students, especially those with learning disabilities, who require special education services. Whereas the focus of RtI is on identifying and remediating the needs of the individual, MTSS is designed to prevent school failure. In addition, in MTSS the focus of support is contextualized within the environment (Sailor, 2015), which makes it particularly applicable for IEP teams to reference when considering the needs of students with ASD and their educational settings. MTSS is similar to RtI in that general education guides all student learning. Like RtI, support is provided on increasing levels of intensity from differentiation of core instruction, to focused instruction for a small group of students with common needs, to

intensive individualized instruction (Gamm et al., 2012). As the name suggests, MTSS offers flexibility to educators in that supports can be offered in more than one domain. For students with ASD, who may require academic, behavioral, and social-emotional support, MTSS provides educators with a framework in which services in one area can be offered without precluding support in another.

Using a model of MTSS, educators may address the learning needs of students with ASD, alongside teacher-student ratio as a guide to allocating resources and personnel. Less intensive, differentiated interventions can be used during whole class instruction. They can be implemented by the GE teacher or a paraprofessional. Some interventions are more targeted, requiring educators to model a strategy and guide students for a period of time before students can use the intervention independently, whereas other interventions will nearly always require small group instruction. In such cases educators will need to determine whether push-in services, pull-out services, or paraprofessional training are necessary. Interventions unique to the learning needs of individuals with ASD may require intensive one-to-one instruction. In such cases qualified individuals will be assigned to work with the student.

Research-based Practices in Literacy

Several recent reviews (Accardo, 2015; Accardo, Finnegan, Kuder, & Bomgardner, 2019; Finnegan & Mazin, 2016; Pennington & Delano, 2012) have identified effective strategies to develop reading comprehension and written expression in students with ASD. These reviews were chosen for this project because they emphasize holistic or multifaceted elements of literacy rather than skill-based activities such as sight word recognition. Although phonological skills and sight word recognition are critical to

success in reading, they are considered foundational skills which students have mastered by fourth grade, and only comprise a small fraction of the standards students in GE classrooms are expected to reach. In addition to the studies included in these reviews, four studies published between 2012 and 2017 were considered relevant.

Differentiated Support

Differentiated support refers to strategies which can be implemented during core instruction in a GE classroom by GE teachers (National Center on Intensive Intervention [NCII], 2014). Suggestions for research-based differentiated supports can be found in Table 1. It is anticipated strategic instruction in literacy is being implemented. Research has revealed examples such as graphic organizers, and Question-Answer relationships are effective for students with ASD. Graphic organizers are commonly used with students with disabilities (Jitendra & Gajria, 2011) and have been used to support students with ASD in their comprehension of story structure (Stringfield, Luscre, & Gast, 2011), science texts (Carnahan & Williamson, 2013), and development of persuasive writing (Bishop, Sawyer, Alber-Morgan, & Boggs, 2015).

Question-answer relationships, which provide a structure for helping students answer comprehension questions about a text, have been widely used in GE classrooms (Raphael & Au, 2005), and have been found to be effective for students with ASD (Asberg & Dahlgren-Sandberg, 2010). Question-answer relationships are listed under differentiated support since it is a strategy often taught in GE settings. However, students with ASD may benefit from targeted support in question-answer relationships if it is not covered in core instruction.

Differentiated supports can be provided in the form of peer-mediated practice such as peer tutoring and cooperative learning. To date, studies measuring the effect of peer tutoring and cooperative learning have focused on supplementing whole class instruction (Kamps, Barbeta, Leonard, & Delquadri, 1994; Kamps, Leonard, Potucek, & Garrison-Harrell, 1995; Kamps, Locke, Delquadri, & Hall, 1989). Peer-mediated practice has focused on skills such as fluency, vocabulary, and responding to comprehension questions. As a rule, peers are trained to give feedback, and teachers monitor students to ensure corrective feedback and reinforcement are given appropriately. Other differentiated supports such as adapted texts and key words (Carnahan & Williamson, 2013) can also be used. Potentially, character maps, self-regulated strategy development, and supported electronic texts (Table 2) could be used as differentiated supports.

Differentiated support is given as required, and in a MTSS model would not be dependent on whether or not a student is eligible for special educational services under IDEA (2004). The intermittent nature of differentiated supports signifies teachers need to have supports readily available, and be flexible in their use. For example, visual supports such as a list of key words could be posted in the classroom at all times for students to refer to as needed. Differentiated supports can be implemented by GE teachers to promote engagement and on-task behavior, so that all students, including students with ASD have access to the core content.

Targeted Support

Targeted support is usually provided in small groups. For the most part the GE teacher

Table 1. *Differentiated Literacy Supports for Students with ASD in General Education Classrooms.*

Strategy or support	Description	Research	Level of Schooling
Adapted texts	Modified reading material	Carnahan & Williamson (2013).	Middle School
Peer-mediated learning	Cooperative learning	Kamps, Leonard, Potucek, & Garrison-Harrell (1995);	Elementary School
	Peer tutoring	Kamps, Barbetta, Leonard, & Delquadri (1994); Kamps, Locke, Delquadri, & Hall (1989).	Elementary School
Graphic organizers	Compare/contrast Venn diagram	Carnahan & Williamson (2013).	Middle School
	Persuasive writing graphic organizer	Bishop, Sawyer, Alber-Morgan, & Boggs (2015).	Middle School
	Story map	Stringfield, Luscre, & Gast (2011).	Elementary School
Question-answer relationships	Structure for helping students understand the relationship between the type of question asked and where the answer can be found.	Asberg & Dahlgren-Sandberg (2010).	Elementary School
Visual supports	Key word list	Carnahan & Williamson (2013).	Middle School

could not deliver this support alone. For IEP teams, targeted support in small groups does provide some flexibility in placement decisions as support could be provided as push-in services, pull-out services, or in a co-taught classroom. Since MTSS aims to provide support for all students, in-class support would provide the most flexibility as students could join the group for targeted support as determined by their changing academic needs. When providing targeted support in GE settings it is important strategies are aligned with the objectives of

the core program. Strategies should lead to increased independence within the GE classroom. Materials should reflect core instruction, and activities should reinforce content learning (NCII, 2014).

In developing educational plans for students with ASD, educators may wish to consider strategies which can be generalized. In literacy, subject material can vary in both genre and content, as such strategies which could be applied to all subjects would give a student with ASD greater autonomy in the

Table 2. *Targeted Literacy Supports for Students with ASD in General Education Classrooms.*

Strategy or support	Description	Research	Level of Schooling
Self-Regulated Strategy Development	POW + ‘www what 2 how 2’ with graphic organizer Narrative and expository writing	Asaro & Saddler (2009); Asaro-Saddler (2014); Asaro-Saddler & Saddler (2010); Schneider, Coddling, Tryon (2013).	Elementary School
	POW+TREE Persuasive writing	Asaro-Saddler & Bak (2012); Asaro-Saddler & Bak (2014); Delano (2007b).	Elementary, Middle, School
	TWA (Before, during and after reading strategies)	Howorth, Lopata, Thomeer, & Rodgers (2016).	Elementary School
Writing process	Responding to story prompts (planning, revising, editing)	Delano (2007a)	Middle School
	Enhancing narrative skills us (planning, revising, publishing)	Bedrosian, Lasker, Speidel, & Politsch (2003).	Middle School
Reciprocal Questioning	Reciprocal questioning in pairs	Whalon & Hanline (2008) Turner, Remington, & Hill (2017).	Elementary School
Character Event Map	Review of key events and figurative language	Williamson, Carnahan, & Birri, Swoboda (2014).	High School
Sequence organizer & cues for wh- questions	Graphic organizer with wh- questions	Bethune & Wood (2013); Mims, Hudson, & Browder (2012).	Elementary, Middle School
Previewing vocabulary	Preview vocabulary, identify main idea and details	Roux, Dion, Barrette, Dupere, & Fuchs (2014).	Elementary School
Thinking maps	Thinking maps show how ideas within metaphors are linked	Mashal & Kasirer (2011).	Middle School
Supported electronic text (eText)	Text enhanced with hyperlinks which can be narrated	Knight, Wood, Spooner, Browder, & O’Brien (2014).	Elementary School
Repeated Reading	Repeated reading with teacher/paraprofessional or independently on a computer	Armstrong & Hughes (2012).	Elementary School
Writing Sentences	Sentence combining	Rousseau, Krantz, Poulson, Kitson, McClannahan, (1994).	Middle School
	Sentence frames	Pennington, Foreman, & Gurney (2017).	Middle School
	Sentence structure	Yamamoto & Miya (1999).	Elementary School

GE classroom. Other targeted supports, which provide more explicit instruction in key concepts, allow students to access the core content, or link the skill or strategy being learned to the core content. See Table 2 for a list of targeted supports.

Instructional methods in self-regulated strategy development (SRSD) which support students in the areas of written expression, require several sessions of teacher-led and guided instruction in SRSD before students are able to use the strategies independently. However, once learned the strategies can be applied to new reading material and new subjects for writing. SRSD has been shown to be effective (Sanders et al., 2019) for many students thus making it an ideal support for students in general education. SRSD is designed to improve students' academic performance by teaching students a systematic approach to use strategies for comprehension and written expression. SRSD aligns with the GE curriculum in that strategies address the expectations of narrative and persuasive writing (Asaro & Saddler, 2009; Asaro-Saddler, 2014; Asaro-Saddler & Bak, 2012, 2014; Asaro-Saddler & Saddler, 2010; Delano, 2007b; Schneider, Codding & Tryon, 2013), and in the case of the TWA strategy, before-during-after strategies for reading comprehension (Howorth, Lopata, Thomeer, & Rodgers, 2016). Likewise other strategies for planning and revising as part of the writing process (Bedrosian, Lasker, Speidel, & Politsch, 2003; Delano, 2007a) require teacher-led instruction before the student is able to use them independently.

Studies on reciprocal questioning (Turner, Remington, & Hill, 2017; Whalon & Hanline, 2008) demonstrate how a targeted support can be used to prepare students with ASD for the participatory demands of the GE classroom. In addition to teaching students

how to generate questions in order to better understand their reading, reciprocal questioning techniques can increase interaction with peers and overall engagement in the GE classroom.

Targeted support is often used to provide a means for students to access the core content. Explicit instruction can be used in a small group format, along with differentiated supports known to be effective, for example, graphic organizers. This type of intervention may require long-term small group support as new content is continually introduced, as in the case of reading a novel (Williamson, Carnahan, Birri, & Swoboda, 2014). The instruction can also be adjusted to match the students' current academic needs and/or reading levels. Examples of targeted support which can be aligned with the core content include character event maps (Williamson et al., 2014), previewing vocabulary (Roux, Dion, Barrette, Dupere, & Fuchs, 2014), sequence organizers (Mims, Hudson, & Browder, 2012), supported electronic texts (Knight, Wood, Spooner, Browder, & O'Brien, 2014), and thinking maps (Mashal & Kasirer, 2012).

Paraprofessionals can play a vital role in providing targeted support for skill-based interventions which do not require extensive curricular content knowledge to teach. Sentence frames (Pennington, Foreman, & Gurney, 2017), sentence combining (Rousseau, Krantz, Poulson, Kitson, & McClannahan, 1994), and sentence structure (Yamamoto & Miya, 1999) are strategies which could be aligned to the GE curriculum in regard to content, but would target a students' individual academic needs. Repeated reading (Armstrong & Hughes, 2012) is an effective intervention a paraprofessional could monitor. Considerable time would be needed to create the materials (photographs, index cards, data

Table 3. *Intensive Literacy Supports for Students with ASD in General Education Classrooms.*

Strategy or support	Description	Research	Level of Schooling
Direct Instruction program	Step-by-step lessons with frequent teacher feedback focusing on foundational skills in reading.	Flores & Ganz (2007); Flores & Ganz (2009); Ganz & Flores (2009).	Elementary School
Anaphoric cueing	Instruction in identifying referents for pronouns either using cloze passages or concept diagram.	O'Connor & Klein (2004); Solis, El Zein, Vaughn, McCulley, & Falcomata (2016).	Middle School
Copy-cover-compare method	Study strategy for spelling using alternative and augmentative communication	Schlosser & Blischak (2004); Schlosser, Blischak, Belfiore, Bartley, & Barnett (1998).	Elementary School
Pixwriter™ - with simultaneous prompting	Narrative writing using a software template	Pennington, Collins, Stenhoff, Turner, & Gunselman (2014); Pennington, Stenhoff, Gibson, & Ballou (2012).	Elementary School
Clicker 5™ - with simultaneous prompting	Narrative writing using a software template	Pennington, Ault, Schuster, & Sanders (2010).	Elementary School
Spelling video models	Computerized video models of spelling	Kinney, Vedora, & Stromer (2003).	Elementary School
Table-to-text organizer	Persuasive writing using table-to-text organizer	Evmenova et al. (2016).	Middle School
Task analysis	Translate facts from a passage to a graphic organizer	Lee, Hawley, Browder, Flowers, & Wakeman (2016).	Middle School

collection sheets) for these skill-based interventions, but much of this work can be done by a paraprofessional under the direction of a certified teacher. With proper training, paraprofessionals could administer the interventions in sentence frames, sentence combining, sentence structure, and repeated reading.

Intensive Supports

Intensive supports and interventions (Table 3) are individualized so as to meet a particular student's academic and behavioral needs. Progress monitoring enables teachers to identify specific skills to work on and modify

instruction when necessary. Students requiring this level of support will need texts written at their reading level, and may even require a separate reading curriculum. Grade level texts will have to be broken down for students perhaps even to the sentence level (NCII, 2014). Intensive supports will require teachers to prioritize concrete concepts, focus on high-utility words, and provide explicit review. Special education teachers and GE teachers would have to collaborate at many different points during instruction (planning, implementation, and assessment) in order to provide this level of support within the GE

classroom. Students requiring intensive supports would receive one-on-one instruction, or instruction in groups of two or three at most.

Several studies have been done showing the effectiveness of Direct Instruction on improving the reading comprehension skills of students with ASD (Bethune & Wood, 2013; Flores & Ganz, 2007, 2009; Ganz & Flores, 2009). Direct Instruction requires frequent, immediate corrective feedback from the teacher so can only be taught in small groups or in one-to-one settings. In addition, it is unlikely to align with GE core instruction. When the IEP team decides a student with ASD would require such a program, a qualified teacher would be needed to be available to teach it.

Likewise, a strategy like anaphoric cueing (O'Connor & Klein, 2004; Solis, El Zein, Vaughn, McCulley, & Falcomata, 2016) requires a qualified teacher knowledgeable in the characteristics and needs of students with ASD to provide instruction. Anaphoric cueing, a technique which trains students to link pronouns with their referents, is beneficial to students with ASD, who may have difficulty with either pronoun use, or difficulty understanding the interactions between characters in class texts. Since this intervention targets the unique needs of students with ASD, it is possible no other students in the class will need this support.

Several studies have targeted individual academic needs in students with ASD, which require substantial one-on-one support. Writing interventions which use software templates and simultaneous prompting to support student writing (Pennington, Ault, Schuster, & Sanders, 2010; Pennington, Collins, Stenhoff, Turner, & Gunselman, 2014; Pennington, Stenhoff, Gibson, & Ballou, 2012), could use topics aligned with

GE core content, but would need a trained paraprofessional to carry out the simultaneous prompting. Similarly, interventions designed for students who use augmentative and alternative communication (Schlosser & Blischak, 2004; Schlosser, Blischak, Belfiore, Bartley, & Barnett, 1998) to improve spelling skills or task analysis to support student completion of responses to a given text (Lee, Hawley, Browder, Flowers, & Wakeman, 2016) will need a trained professional to work with the student.

Spelling video models (Kinney, Vedora, & Stromer, 2003) and table-to-text writing organizers (Evmenova et al., 2016) can be considered to be intensive due to the level of support given to the student in regard to the completion of their work. Potentially students could use spelling video models and table-to-text organizers independently, however both interventions require substantial amount of work to prepare the materials and monitor student progress.

Conclusion

Three important themes emerge from the application of literacy instruction within an MTSS for students with ASD in inclusive settings; student engagement, collaboration, and the importance of technology. With respect to student engagement, it is important to recognize students with ASD who are placed in inclusive settings are more accepted by peers in early grades (Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010). Not only are they exposed to the general education curriculum, they also have the opportunity to improve their social skills and develop lasting friendships. This has implications for instructional decision-making in the students with ASD may have better long-term outcomes if they are placed in an inclusive setting in the early grades, rather than having to demonstrate they are 'ready' for an inclusive setting.

GE teachers report they struggle to engage students with ASD because they do not know how to help those students participate through peer-to-peer interaction (Wangsgard & Cordon, 2018). A number of interventions found to improve reading and writing skills in students with ASD also have social components. Teachers in inclusive settings need to consider the benefits of interventions such as classwide peer-tutoring (Kamps et al., 1994), reciprocal questioning (Whalon & Hanline, 2008), and small-group instruction (Williamson et al., 2014) on social participation as well as academic achievement.

Collaboration is key in the IEP process as well as in co-taught environments. Collaboration is effective if participants share responsibility for decision-making and delivery of services. This means teachers must share expertise, and contribute to the learning success of all students. In the case of literacy instruction for students with ASD, GE teachers can provide valuable information about core instruction and the expectations of the classroom. Special educators would be advised to share their knowledge regarding the characteristics of students with ASD, and work with GE teachers to match supports and resources to students' learning needs. Administrators can play a vital role in ensuring collaboration is effective by scheduling joint planning time for co-teachers, and providing in-service training on coteaching, collaboration, and joint decision-making.

Technology has the potential to facilitate greater student independence in the GE curriculum. For example, students using computers for repeated reading, need less personnel support than students using a reading book (Armstrong & Hughes, 2012). Technology also provides more opportunities for individualization as in the case of

supported electronic texts. Students can use features of supported electronic texts as needed, whether it be a hyperlink to the definition of a word, a highlighter to mark key concepts, or a narrator to listen to the text. Learning objectives can also be individualized, especially in the area of written expression. All students may be required to write a short narrative, but with varied technological supports this could vary from a five paragraph story, to a paragraph, to a few simple sentences. Technology can also be used to increase engagement between students. Writing can be shared electronically for revision and peer evaluation. As such it is important to devote instructional time to technological features, such as spell check, track changes, and sharing, students will be expected to use.

Technology can be costly, and it can be extremely time-consuming to set up content on technological devices. Educators would be advised to look for existing resources, such as interactive graphic organizers, rather than create their own from scratch. Administrators could consider purchasing access to supported electronic texts, some which even adjust the reading level of the text, for their inclusive classrooms so that all students have access to the core content.

The MTSS model offers a flexible structure for teachers, IEP teams, and schools for delivering high quality instruction, research-based practices, and effective support. The academic supports described above can be used in combination with behavioral supports (Leach, 2018). Many of the supports described will be beneficial to students who do not have ASD, which facilitates flexible grouping arrangements that are often necessary in GE classrooms. Teachers can group students according to need rather than disability category. It is important to note supports are offered on a continuum within

the MTSS framework. In practice, one GE teacher may use SRSD in whole class instruction, whereas in another GE classroom, a special education teacher may use SRSD with a small group. On the other hand, a strategy such as repeated reading would be considered an intensive support if it was only applicable to one student who needed to utilize this approach several times a day. When planning and implementing instruction, teachers must be attentive to modifications (e.g., text written at student's

reading level) and accommodations, (e.g., laptop for writing) each student requires. It is also important to remember when selecting supports for students with ASD, very few studies to date have been conducted in GE classrooms, although several have used curricular materials from the GE curriculum. As such, it is important educators monitor students' responses when implementing these supports and interventions, and adjust their instruction accordingly.

References

- Accardo A. L. (2015). Research synthesis: effective practices for improving the reading comprehension of students with autism spectrum disorder. *DADD Online Journal* 2(1), 7–20.
- 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*. 1-19.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Armstrong, T. K., & Hughes, M. T. (2012). Exploring computer and storybook interventions for children with high functioning autism. *International Journal of Special Education*, 27, 88–99.
- Asaro, K., & Saddler, B. (2009). Effects of planning instruction on a young writer with Asperger syndrome. *Intervention in School and Clinic*, 44, 268–275. doi: 10.1177/1053451208330895
- Asaro-Saddler, K. (2014). Self-regulated strategy development: Effects on writers with autism spectrum disorders. *Education and Training in Autism and Developmental Disabilities*, 49, 78-91.
- Asaro-Saddler, K., & Bak, N. (2012). Teaching children with high-functioning autism spectrum disorders to write persuasive essays. *Topics in Language Disorders*, 32, 361-378. doi: 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, 92-105. doi: 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, 107–124. doi: 10.1177/001440291007700105
- Asberg, J., & Dahlgren-Sandberg, A. (2010). Discourse comprehension intervention for high-functioning students with autism spectrum disorders: Preliminary findings from a school-based study. *Journal of Research in Special Educational Needs*, 10, 91–98. doi: 10.1111/j.1471–3802.2010.01147.x

- Bedrosian, J., Lasker, J., Speidel, K., & Politsch, A. (2003). Enhancing the written narrative skills of AAC students with autism: Evidence-based research issues. *Topics in Language Disorders, 23*, 305–324. doi: 10.1097/00011363-200310000-00006
- Bethune, K. S., & Wood, C. L. (2013). Effects of wh-question graphic organizers on reading comprehension skills of students with autism spectrum disorders. *Education and Training in Autism and Developmental Disabilities, 48*, 236–244.
- Bishop, A. E., Sawyer, M., Alber-Morgan, S. R., & Boggs, M. (2015). Effects of a graphic organizer training package on the persuasive writing of middle school students with autism. *Education and Training in Autism and Developmental Disabilities, 50*, 290-302.
- Brown, H. M., Oram-Cardy, J., & Johnson, A. (2013). A meta-analysis of the reading comprehension skills of individuals on the autism spectrum. *Journal of Autism and Developmental Disorders, 43*, 932–955. doi: 10.1007/s10803-012-1638-1
- Carnahan, C. R., & Williamson, P. S. (2013). Does compare-contrast text structure help students with autism spectrum disorder comprehend science text? *Exceptional Children, 79*, 347-363. doi: 10.1177/001440291307900302
- Crosland, K., & Dunlap, G. (2012). Effective strategies for the inclusion of children with autism in general education classrooms. *Behavior Modification, 36*, 251-269. doi: 10.1177/0145445512442682
- Delano, M. E. (2007a). Use of strategy instruction to improve the story writing skills of a student with Asperger syndrome. *Focus on Autism and Other Developmental Disabilities, 22*, 252–258. doi: 10.1177/10883576070220040701
- Delano, M. E. (2007b). Improving written language performance of adolescents with Asperger syndrome. *Journal of Applied Behavior Analysis, 40*, 345–351.
- Dynia, J. M., Lawton, K., Logan, J. A., & Justice, L. M. (2014). Comparing emergent-literacy skills and home-literacy environment of children with autism and their peers. *Topics in Early Childhood Special Education, 34*, 142-153. doi: 10.1177/0271121414536784
- Evmenova, A. S., Regan, K., Boykin, A., Good, K., Hughes, M., MacVittie, N., . . . Chirinos, D. (2016). Emphasizing planning for essay writing with a computer-based graphic organizer. *Exceptional Children, 82*, 170-191. doi: 10.1177/0014402915591697
- Finnegan, E., & Mazin, A. L. (2016). Strategies for increasing reading comprehension skills in students with autism spectrum disorder: A review of the literature. *Education and Treatment of Children, 39*, 187-219.
- Finnegan, E., & Accardo, A. L. (2018). Written expression in individuals with autism spectrum disorder: A meta-analysis. *Journal of Autism and Developmental Disorders, 48*, 868-882. doi: 10.1007/s10803-017-3385-9
- Flores, M. M., & Ganz, J. B. (2007). Effectiveness of direct instruction for teaching statement inference, use of facts, and analogies to students with developmental disabilities and reading delays. *Focus on Autism and Other Developmental Disabilities, 22*, 244-251. doi: 10.1177/10883576070220040601
- Flores, M. M., & Ganz, J. B. (2009). Effects of direct instruction on the reading comprehension of students with autism and developmental disabilities. *Education and Training in Developmental Disabilities, 44*, 39–53.
- Gamm, S., Elliott, J., Halbert, J. W., Price-Baugh, R., Hall, R., Walston, D., ... & Casserly, M. (2012). *Common Core State Standards and Diverse Urban Students: Using Multi-Tiered Systems of Support*. Washington DC: Council of the Great City Schools.

- Ganz, J. B., & Flores, M. M. (2009). The effectiveness of direct instruction for teaching language to students with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 39*, 75–83. doi: 10.1007/s10803-008-0602-6
- Howorth, S., Lopata, C., Thomeer, M., & Rodgers, J. (2016). Effects of the TWA strategy on expository reading comprehension of students with autism. *British Journal of Special Education, 43*, 39-59. doi: 10.1111/1467-8578.12122
- Humphrey, N. (2008). Including pupils with autistic spectrum disorders in mainstream schools. *Support for Learning, 23*, 41-47. doi: 10.1111/j.1467-9604.2007.00367.x
- Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004).
- Jitendra, A. K., & Gajria, M. (2011). Reading comprehension instruction for students with learning disabilities. *Focus on Exceptional Children, 43*, 1-16.
- Kamps, D. M., Barbetta, P. M., Leonard, B. R., & Delquadri, J. (1994). Classwide peer tutoring: An integration strategy to improve reading skills and promote peer interactions among students with autism and general education peers. *Journal of Applied Behavior Analysis, 27*, 49-61.
- Kamps, D. M., Leonard, B., Potucek, J., & Garrison-Harrell, L. (1995). Cooperative learning groups in reading: An integration strategy for students with autism and general classroom peers. *Behavioral Disorders, 21*, 89-109.
- Kamps, D., Locke, P., Delquadri, J., & Hall, V. R. (1989). Increasing academic skills of students with autism using fifth grade peers as tutors. *Education & Treatment of Children, 12*, 38–51.
- Kinney, E. M., Vedora, J., & Stromer, R. (2003). Computer-presented video models to teach generative spelling to a child with an autism spectrum disorder. *Journal of Positive Behavior Interventions, 5*, 22-29. doi: 10.1177/10983007030050010301
- Knight, V. F., Wood, C. L., Spooner, F., Browder, D. M., & O'Brien, C. P. (2014). An exploratory study using science texts with students with autism spectrum disorder. *Focus on Autism and Other Developmental Disabilities, 30*, 1–14. doi: 10.1177/1088357614559214
- Lanter, E., Freeman, D., & Dove, S. (2012). Procedural and conceptual print-related achievements in young children with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 28*, 14-25. doi: 10.1177/1088357612459270
- Leach, D. (2018). Using multi-tiered systems of support for students with autism spectrum disorders in inclusive classrooms. *DADD Online Journal 5*, 6-17.
- Leblanc, L., Richardson, W., & Burns, K. A. (2009). Autism spectrum disorder and the inclusive classroom: Effective training to enhance knowledge of ASD and evidence-based practices. *Teacher Education and Special Education, 32*, 166-179. doi: 10.1177/0741932507334279
- Lee, A., Hawley, K., Browder, D. M., Flowers, C., & Wakeman, S. (2016). Teaching writing in response to text to students with developmental disabilities who participate in alternate assessments. *Education and Training in Autism and Developmental Disabilities, 51*, 238-251.
- Lonigan, C. J., & Shanahan, T. (2009). *Developing Early Literacy: Report of the National Early Literacy Panel. Executive Summary. A Scientific Synthesis of Early Literacy Development and Implications for Intervention*. Jessup, MD: National Institute for Literacy at EdPubs.

- Mashal, N., & Kasirer, A. (2012). Principal component analysis study of visual and verbal metaphoric comprehension in children with autism and learning disabilities. *Research in Developmental Disabilities, 33*, 274-282. doi: 10.1016/j.ridd.2011.09.010
- Mims, P. J., Hudson, M. E., & Browder, D. M. (2012). Using read-alouds of grade-level biographies and systematic prompting to promote comprehension for students with moderate and severe developmental disabilities. *Focus on Autism and Other Developmental Disabilities, 27*, 67-80. doi: 10.1177/1088357612446859
- Nation, K., Clarke, P., Wright, B., & Williams, C. (2006). Patterns of reading ability in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 36*, 911-919. doi: 10.1007/s10803-006-0130-1
- National Center on Intensive Intervention. (2014). *Planning standards-aligned instruction within a multi-tiered system of support*. Retrieved from https://intensiveintervention.org/sites/default/files/ReadCompExample_508.pdf
- O'Connor I. M., & Klein, P. D. (2004). Exploration of strategies for facilitating the reading comprehension of high-functioning students with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 34*, 115-127.
- Pennington, R. C., Ault, M. J., Schuster, J. W., & Sanders, A. (2010). Using Simultaneous Prompting and Computer-Assisted Instruction to Teach Story Writing to Students with Autism. *Assistive Technology Outcomes and Benefits, 7*, 24-38.
- Pennington, R. C., Collins, B. C., Stenhoff, D. M., Turner, K., & Gunselman, K. (2014). Using simultaneous prompting and computer-assisted instruction to teach narrative writing skills to students with autism. *Education and Training in Autism and Developmental Disabilities, 49*, 396-414.
- Pennington, R. C., & Delano, M. E. (2012). Writing instruction for students with autism spectrum disorders: A review of literature. *Focus on Autism and Other Developmental Disabilities, 27*, 158-167. doi: 10.1177/1088357612451318
- Pennington, R. C., Foreman, L. H., & Gurney, B. N. (2017). An evaluation of procedures for teaching students with moderate to severe disabilities to write sentences. *Remedial and Special Education, 39*, 27-38. doi:10.1177/0741932517708428
- Pennington, R. C., Stenhoff, D. M., Gibson, J., & Ballou, K. (2012). Using simultaneous prompting to teach computer-based story writing to a student with autism. *Education and Treatment of Children, 35*, 389-406.
- Raphael, T. E., & Au, K. H. (2005). QAR: Enhancing comprehension and test taking across grades and content areas. *The Reading Teacher, 59*, 206-221.
- Rotheram-Fuller, E., Kasari, C., Chamberlain, B., & Locke, J. (2010). Social involvement of children with autism spectrum disorders in elementary school classrooms. *Journal of Child Psychology and Psychiatry, 51*, 1227-1234. doi: 10.1111/j.1469-7610.2010.02289.x
- Rousseau, M. K., Krantz, P. J., Poulson, C. L., Kitson, M. E., & McClannahan, L. E. (1994). Sentence combining as a technique for increasing adjective use in writing by students with autism. *Research in Developmental Disabilities, 15*, 19-37. doi: 10.1016/0891-4222(94)90036-1
- Roux, C., Dion, E., Barrette, A., Dupere, V., & Fuchs, D. (2014). Efficacy of an intervention to enhance reading comprehension of students with high-functioning autism spectrum disorder. *Remedial and Special Education, 36*, 1-12. doi: 10.1177/0741932514533998

- Sailor, W. (2015). Advances in schoolwide inclusive school reform. *Remedial and Special Education, 36*, 94-99. doi: 10.1177/0741932514555021
- Saldaña, D., & Frith, U. (2007). Do readers with autism make bridging inferences from world knowledge? *Journal of Experimental Child Psychology, 96*, 310-319. doi: 10.1016/j.jecp.2006.11.002
- Sanders, A., Losinski, M., Parks Ennis, R., White, W., Teagarden, J., & Lane, J. (2019). A meta-analysis of self-regulated strategy development reading interventions to improve the reading comprehension of students with disabilities. *Reading & Writing Quarterly*. Advance online publication. doi: 10.1080/10573569.2018.1545616
- Schlosser, R. W., & Blischak, D. M. (2004). Effects of speech and print feedback on spelling by children with autism. *Journal of Speech, Language, and Hearing Research, 47*, 848-862. doi:10.1044/1092-4388(2004/063)
- Schlosser, R. W., Blischak, D. M., Belfiore, P. J., Bartley, C., & Barnett, N. (1998). Effects of synthetic speech output and orthographic feedback on spelling in a student with autism: A preliminary study. *Journal of Autism and Developmental Disorders, 28*, 309-319.
- Schneider, A. B., Coddling, 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*, 101-114. doi: 10.1177/1088357613475811
- Scruggs, T. E., & Mastropieri, M. A. (1996). Teacher perceptions of mainstreaming/inclusion, 1958-1995: A research synthesis. *Exceptional Children, 63*, 59-74. doi: 10.1177/001440299606300106
- Segall, M. J., & Campbell, J. M. (2012). Factors relating to education professionals' classroom practices for the inclusion of students with autism spectrum disorders. *Research in Autism Spectrum Disorders, 6*, 1156-1167. doi: 10.1016/j.rasd.2012.02.007
- Solis, M., El Zein, F., Vaughn, S., McCulley, L. V., & Falcomata, T. S. (2016). Reading comprehension interventions for students with autism spectrum disorders: an alternating treatments comparison. *Focus on Autism and Other Developmental Disabilities, 31*, 284-299. doi: 10.1177/1088357615583464
- Stringfield, S. G., Luscre, D., & Gast, D. (2011). Effects of a story map on Accelerated Reader post-reading test scores in students with high-functioning autism. *Focus on Autism and Other Developmental Disabilities, 26*, 218-229. doi: 10.1177/1088357611423543
- Turner, H., Remington, A., & Hill, V. (2017). Developing an intervention to improve reading comprehension for children and young people with autism spectrum disorder. *Educational & Child Psychology, 34*, 13-26.
- U.S. Department of Education, National Center for Educational Statistics. (2016). Retrieved from https://nces.ed.gov/programs/digest/d16/tables/dt16_204.60.asp
- Wangsgard, N., & Cordon, T. (2018). Perceptions from general education teachers who work with students with autism spectrum disorder. *The International Journal of Learning: Annual Review, 25*(1), 1-11. doi:10.18848/1447-9494/CGP/v25i01/1-11.
- Westerveld, M. F., Paynter, J., Trembath, D., Webster, A. A., Hodge, A. M., & Roberts, J. (2017). The emergent literacy skills of preschool children with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 47*, 424-438. doi: 10.1007/s10803-016-2964-5

- Whalon, K., & Hanline, M. F. (2008). Effects of a reciprocal questioning intervention on the question generation and responding of children with autism spectrum disorder. *Education & Training in Developmental Disabilities, 43*, 367–387.
- Williamson, P., Carnahan, C. R., Birri, N., & Swoboda, C. (2014). Improving comprehension of narrative using character event maps for high school students with autism spectrum disorder. *The Journal of Special Education, 48*(1), 1–11. doi: 10.1177/0022466914521301
- Yamamoto, J. I., & Miya, T. (1999). Acquisition and transfer of sentence construction in autistic students: Analysis by computer-based teaching. *Research in Developmental Disabilities, 20*, 355-377. doi: 10.1016/S0891-4222(99)00017-7

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Effectively Utilizing Peer Mentors to Increase Academic and Social Engagement on the University Campus

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Abstract: Since the passage of the Federal Higher Education Opportunity Act of 2008 (HEOA), the number of post-secondary programs for students with intellectual and developmental disabilities (I/DD) has dramatically increased. This article provides guidance for those leading post-secondary programs to effectively utilize peer mentors to enhance the inclusive college experience for students with I/DD. Suggestions are included for peer mentor recruitment, training, ongoing support, and honoring the strengths and interests of peer mentors to enhance their engagement, fulfillment, and impact.

Since the passage of the Federal Higher Education Opportunity Act of 2008 (HEOA), the number of post-secondary programs for students with intellectual and developmental disabilities (I/DD) has dramatically increased with over 270 programs now in existence across the United States (<https://thinkcollege.net/college-search>).

There is great variability among the programs resulting in differing experiences for students with I/DD depending on the college or university program they select (Grigal, Hart, & Weir, 2012). There are three ways to describe post-secondary programs for students with I/DD including “substantially separate programs,” “mixed programs,” and “inclusive individualized programs” (Hart, Mele-McCarthy, Pasternack, Zimbrich, & Parker, 2004; Neubert, Moon, & Grigal, 2002; Stodden & Whelley, 2004). Substantially separate programs create learning experiences specifically for the students with I/DD without much integration in typical campus life. Mixed programs provide some separate learning experiences and some inclusion in traditional courses and campus activities. Inclusive individualized programs use person-centered planning to create fully inclusive learning experiences

integrated within traditional courses, residential life, student employment settings, and a variety of recreational activities based on student interests, strengths, goals, and needed supports.

Many post-secondary programs for students with I/DD utilize the supports of peer mentors to optimize the academic and social engagement of the participating students. Overall, college students indicate positive attitudes toward students with I/DD and have very little concern about including these students in college life (Griffin, Summer, McMillan, Day, & Hodapp, 2012). Thus, it only makes sense to tap into the natural supports they are able to provide. This not only has a positive impact on the students with I/DD, but peers who interact with these students benefit in a variety of ways. A survey of 162 students who lived in dormitories with students with I/DD were asked about friendships with residents with I/DD, and 40% agreed or strongly agreed that friendships had developed (Hafner, Moffat, & Kisa, 2011). College students who serve as peer mentors for students with I/DD report personal growth, gaining work experience and knowledge, interpersonal skill

development, changed perspectives on disabilities, leadership skills, organizational skills, and personal satisfaction (Farley, Gibbons, & Cihak, 2014; Sowell & Maddox, 2015). Ultimately, the mentors and the mentees all learn through the mentoring process. Both parties report, however, the need for the three R's: respect, responsibility, and reliability (Jones & Goble, 2012). Training for peer mentors that cover these three characteristics of a successful peer mentor is essential.

Winthrop Think College

Winthrop Think College (WTC) is an inclusive individualized post-secondary program for students with I/DD located in Rock Hill, South Carolina. Person-centered planning is used to design programs of study and the necessary academic, independent living, employment, social, and recreational supports. Program participants actively participate in traditional university courses, live in residential halls across campus, engage in internships and/or paid employment on and off campus, get involved in clubs and organizations, attend sporting events and cultural events, and participate in a variety of other recreational activities available to all university students. They also receive individualized instruction and support to address their long- and short-term goals. Peer mentors serve as natural supports (Kelley & Westling, 2013) to enhance the academic and social engagement of the WTC program participants. To effectively utilize peer mentors, they receive formal training, ongoing support, and the strengths and interests of peer mentors are considered when assigning roles and responsibilities.

Recruiting Peer Mentors

When WTC peer mentors apply for the position, they complete a questionnaire to identify areas of strength and interest related

to supporting WTC students and the WTC program (see Figure 1). To have diversity of strengths and interests among peer mentors, it is essential to recruit peer mentors from the different colleges and programs on campus as opposed to relying only on special education majors. Although prior disability-related experience is a consistent predictor of college students seeking out opportunities to be involved in the post-secondary programs for students with I/DD (Carter et al., 2018), it is important to recruit students who may not necessarily seek involvement. The easiest way to recruit peer mentors from a variety of programs on campus is using in-class peer mentors already enrolled in the courses the WTC students take. Because person-centered planning is utilized when selecting courses, WTC students enroll in courses across all colleges and most departments on campus. This results in recruiting diverse peer mentors who may be interesting in fulfilling various roles beyond being an in-class peer mentor. A WTC peer mentor may support one student or multiple students depending on their strengths and interests and their availability.

Peer Mentor Training and Support

All peer mentors attend a two-hour training led by the WTC Coordinator before assuming any responsibilities. During this training, they learn about the mission of the WTC program, general characteristics of students with intellectual and developmental disabilities, expectations for treating WTC program participants as same-age friends, different types of support they will provide to WTC students as in-class peer mentors, job coaches, residential mentors, and mentors who support students in recreational engagement on campus, what to do in the event of a crisis, and they receive specific information about responsibilities as a WTC peer mentor (see Figure 2).

Figure 1. *Peer Mentor Questionnaire*

Date: _____ Name: _____ Major: _____

1. What areas below do you feel you have the knowledge and skills needed to support a WTC student in meeting individualized goals (check all that apply):

- Nutrition
- Physical fitness (specify: _____)
- Money management/budgeting
- Job skills
- Time management
- Personal goal setting and self-evaluation
- Organizational skills
- Active involvement in campus clubs and/or organizations
- Active engagement in recreational activities on campus
- Daily living skills (e.g. personal care, housekeeping, cooking)
- Study skills
- Writing skills
- Reading skills
- Communication skills
- Math skills
- Computer software (e.g. PowerPoint, spreadsheets, word processing)
- Safe social media use
- Dating/sex education

Coursework

- Theater
- Art
- Music
- English
- Biology
- Chemistry
- History
- Sociology
- Economics
- Geography
- Physics
- Psychology
- Business
- Education
- Computer programming
- Health/Nutrition
- Public Speaking
- Foreign language: (specify: _____)
- Personal fitness/exercise science
- Other: _____

2. I am interested in volunteering for the following types of activities (check all that apply):
- Having lunch with WTC students
 - Hanging out socially with WTC students during the day
 - Hanging out socially with WTC students for evening events
 - Hanging out socially with WTC students for weekend events
 - Being an in-class peer-mentor (in a class I am already enrolled)
 - Being a part of WTC student person centered planning meetings
 - Planning WTC events (e.g. parties, community service, disability awareness and advocacy, Special Olympics/Unified Sports, weekend/spring break trips)
 - Other: _____
3. I am interested in paid work with WTC for the following (check all that apply):
- Providing individualized instruction related to the WTC student's person-centered plan (in areas I identified in #5 above)
 - Serving as a job coach in an internship or employment setting
 - Working with the WTC Coordinator on program wide initiatives and/or daily operations. Specify (optional): _____

At the training, they also learn the difference between paid vs. unpaid activities. The general rule is that if they are engaging in activities they would not typically engage in with a friend without a disability, those are things for which they are paid. However, activities such as having meals together, sitting together in class, going to recreational activities on campus together, going shopping, and going to the movies are all unpaid.

After peer mentors participate in the initial training, they are required to complete online peer mentor training videos through Think College, the national coordinating center for post-secondary programs for students with I/DD. There are currently four training videos available related to providing academic support. Peer mentors review each video, answer questions, and submit their responses

Table 1 includes the link to the trainings, titles of the trainings, and questions the peer mentors answer following each training video.

Peers who are hired to serve as residential mentors are roommates of WTC students who provide independent living support, academic support, and recreational support to ensure active engagement on campus. Residential mentors enroll in a one-credit course before their first year in that role. The course is offered during the second half of the spring semester to allow ample time for preparation before the fall semester begins but close enough to the beginning of the fall semester, so they do not forget what they learned. The course is co-taught by an experienced residential peer mentor and the WTC Coordinator. The course goals include (a) deepen understanding of characteristics

Figure 2. *WTC Peer Mentor Policy*

Winthrop Think College Peer Mentor Policy

The mission of Winthrop University's Think College Program is to provide an inclusive post-secondary experience to students with intellectual and developmental disabilities to prepare them for competitive employment and active participation in local communities with as much independence as possible.

As a Peer Mentor I Will...

- ❖ Communicate with WTC leadership regarding questions and concerns.
- ❖ Have high expectations for WTC students.
- ❖ Offer support and encouragement to students.
- ❖ Provide support in academic, employment, social, and recreational activities.
- ❖ Support WTC students in developing personal and academic skills to be successful in a post-secondary education experience.
- ❖ Support WTC students in setting and maintaining goals.
- ❖ Maintain confidentiality of WTC student information.
- ❖ Report any information related to safety concerns to WTC leadership.
- ❖ Treat WTC students in age appropriate ways.
- ❖ Engage in age appropriate activities with WTC students.
- ❖ Ask for help if I need assistance when working with a WTC student.
- ❖ Refer to students by their name, not their disability/ use person-first language.
- ❖ If I develop romantic feelings for a student, I will resign from my role as a peer mentor.
- ❖ Be on time for all scheduled meetings and activities.
- ❖ Follow the Winthrop University Code of Conduct.
- ❖ Foster inclusive practices across campus and the community.
- ❖ Act as a liaison between Winthrop Faculty/Staff and WTC students.
- ❖ Complete paperwork and time sheets in a timely manner.

Name _____ Signature _____ Date _____

of individuals with intellectual and developmental disabilities, (b) prepare student leaders to effectively support students with intellectual and developmental disabilities across settings, and (c) prepare student leaders to support students with intellectual and developmental disabilities in gaining independence and self-advocacy skills.

Whenever possible peer mentors are offered opportunities to attend trainings delivered by state agencies such as Vocational Rehabilitation and the Department of

Disabilities and Special Needs. Training topics that are relevant to the roles in which peer mentors serve include, but are not limited to, resumé building, job coaching, supported living, transportation, and assistive technology. Peer mentors are also provided opportunities to attend state and national conferences that include sessions related to post-secondary education for students with I/DD. Additionally, they often present in collaboration with the WTC Coordinator and WTC students at these conferences to share innovative practices they initiated and/or participated in at the university.

Table 1. *Questions for Peer Mentor Online Training Videos*

Video 1: Supporting Students with Intellectual Disabilities https://thinkcollege.net/training/peer-mentor-training
1. Why have you chosen to support students with intellectual disabilities?
2. What are the five categories for peer mentor academic support?
3. Give two examples of supports that fall under each of the five categories.
4. What are some characteristics of peer mentors that are essential when providing academic support to students with intellectual disabilities?
Video 2: Task Analysis and Academic Mentoring https://thinkcollege.net/training/peer-mentor-training
1. What is task analysis?
2. What is the purpose of using task analysis when providing academic support to students with intellectual disabilities?
3. What step do students frequently skip when using flash cards to study?
4. List the steps suggested in the video for what a student should do when having trouble reading a sentence.
5. What are the benefits of using technology such as Google plugins for students who have difficulty with reading?
6. What can you do to support students with intellectual disabilities with logging in to various websites?
7. How should the steps of a task analysis be presented?
Video 3: Adapting to Individual Student Needs https://thinkcollege.net/training/peer-mentor-training
1. What are some specific ways you can use apps to support students with intellectual disabilities?
2. How will you support students with intellectual disabilities with planning time for studying, completing assignments?
3. How will you support students with intellectual disabilities with increasing involvement in class?
4. How can you support students with intellectual disabilities with written responses to readings?
Video 4: Writing Papers https://thinkcollege.net/training/peer-mentor-training
1. What is a campus resource that can assist students with writing papers?
2. Instead of asking a student what he or she wants to write about, what is another way to help the student prepare to begin a paper?
3. What are the seven steps for supporting a student with writing a paper?
4. When helping students check their papers for spelling and grammar, what tool can you introduce to them that will increase their independence?

or concern is brought to the WTC Coordinator. The lead peer mentor is selected by the WTC Coordinator based on demonstrated excellence in various peer mentor roles, effective interpersonal communication skills, and outstanding leadership potential. Many peer mentors prefer contacting the lead peer mentor to get their questions answered, however, peer mentors may also contact the WTC Coordinator directly to get the support they need with meeting the expectations of their

specific responsibilities. On Fridays, the WTC Coordinator holds mandatory two-hour meetings for residential mentors. During these meetings announcements are shared, innovative ideas are discussed, and each residential mentor shares something that is going well with their roommate and something for which they may need support. The group provides suggestions to address each need, and the roommate then decides on a plan of action after all ideas are shared.

Tapping into the Strengths and Interests of Peer Mentors

By tapping into the strengths and interests of WTC peer mentors, various initiatives have been extremely successful. For example, a nutrition major provides nutrition screenings for all WTC students. She conducts an initial evaluation with the WTC students to get a baseline for their current nutrition habits. She then meets weekly with the WTC students to support them in goal setting, to provide individualized instruction related to individualized nutrition goals, and to guide their progress monitoring and self-evaluation as they focus on improving their eating habits and commitment to healthy living. Additionally, she conducts weekly cooking classes involving the WTC students in healthy meal planning, preparation, cooking, eating together, and cleaning up following the meal. She created a website to allow students, their residential mentors, and their families to access the recipes at any time to promote generalization beyond the cooking classes. To ensure sustainability after she graduates, the peer mentor has already recruited a freshman who will continue this work upon her graduation. The two will work together to support the WTC students while they are both current students. The plan is to continue this recruitment strategy going forward.

Another initiative that was put in place by matching the needs of WTC students to the strengths and interests of peer mentors is the relationship/sex education discussion groups. Using the Elevatus training and curriculum as a guide (McLaughlin, 2018) an outline for the discussion groups was developed by the WTC Coordinator. Next, two peer mentors (one male and one female) who indicated an interest in supporting WTC students with sex education on their questionnaires were selected to participate in training and facilitate the discussion groups. The small

group discussions take place once per week for one hour each session during the fall and spring semesters of the students' first year in the WTC program. The two peer mentors meet with the WTC Coordinator weekly to discuss the successes, problem solve to address any issues from the previous meeting, and to plan the upcoming session.

A third way that the strengths and interests of peer mentors are tapped into is through individualized instruction based on the WTC students' person-centered plans. WTC students set goals in areas such as money management/budgeting, independent living, self-advocacy, employment, functional academics, organizational skills, recreation skills, social communication skills, etc. The peer mentor questionnaires are used to select mentors to provide individualized instruction related to the WTC students' goals. For example, several WTC students indicated an interest in photography. Unfortunately, the photography class on campus fills up very quickly as it has a very low cap for student enrollment. This results in traditional students and WTC students not always having the opportunity to take that class during their program. To address this interest, a WTC peer mentor who indicated an interest in photography started a photography group for WTC students. The group meets twice a week for an hour each semester and they learn photography skills, develop photography portfolios, and create useful materials and presentations to generalize what they are learning. Each semester culminates in a photography show open to the campus community.

Conclusion

The WTC program is successful, in large part, due to the active engagement of the peer mentors. Recruiting peer mentors from diverse majors, providing training and ongoing support to peer mentors, and tapping

into their unique strengths and interests when assigning roles and responsibilities creates a strong peer mentoring program. Current goals for further improving the outcomes of peer mentor supports include supporting peer

mentors in facilitating WTC student relationships with peers who are not peer mentors and increasing WTC student engagement and leadership in clubs and organizations on campus.

References

- Carter, E. W., Gustafson, J. R., Mackay, M. M., Martin, K. P., Parsely, M. V., Grave, J., . . . Cayton, J. (2018). Motivations and expectations of peer mentors within inclusive higher education programs for students with intellectual disability. *Career Development and Transition for Exceptional Individuals*, 1-11.
- Farley, J. A., Gibbons, M. M., & Cihak, D. F. (2014). Peer mentors in a postsecondary education program for students with intellectual disabilities. *College Student Journal*, 48, 651–660.
- Griffin, M. M., Summer, A. H., McMillan, E. D., Day, T. L., & Hodapp, R. M. (2012). Attitudes toward including students with intellectual disabilities at college. *Journal of Policy and Practice in Intellectual Disabilities*, 9, 234–239.
- Grigal, M., Hart, D., & Weir, C. (2012). A survey of postsecondary education programs for students with intellectual disabilities in the United States. *Journal of Policy and Practice in Intellectual Disabilities*, 9, 223–233.
- Hafner, D., Moffat, C., & Kisa, N. (2011). Cutting-edge: Integrating students with intellectual and developmental disabilities into a 4-year liberal arts college. *Career Development for Exceptional Individuals*, 34, 18–30.
- Hart, D., Mele-McCarthy, J., Pasternack, R. H., Zimbrich, K., & Parker, D. R. (2004). Community college: A pathway to success for youth with learning, cognitive, and intellectual disabilities in secondary settings. *Education and Training in Developmental Disabilities*, 39, 54–66.
- Jones, M. M., & Goble, Z. (2012). Creating effective mentoring partnerships for students with intellectual disabilities on campus. *Journal of Policy & Practice in Intellectual Disabilities*, 9, 270–278.
- Kelley, K. R., & Westling, D. L. (2013). A focus on natural supports in postsecondary education for students with intellectual disabilities at Western Carolina University. *Journal of Vocational Rehabilitation*, 38, 67-76.
- McLaughlin, K. (2018). *Sexuality education for people with developmental disabilities*. Elevatus Training LLC and Green Mountain Self-Advocates. <https://www.elevatustraining.com/workshops-and-products/>
- Neubert, D. A., Moon, M. S., & Grigal, M. (2002). Post-secondary education and transition services for students ages 18–21 with significant disabilities. *Focus on Exceptional Children*, 34, 1–11.
- Sowell, R. & Maddox, B. (2015) Added Value: Perspectives of student mentors working within a university level inclusive education program. *Online Journal of Education Research*, 3, 1-10.
- Stodden, R. A., & Whelley, T. (2004). Postsecondary education and persons with intellectual

disabilities: An introduction. *Education and Training in Developmental Disabilities*, 39, 6–15.

Think College (n.d.). <https://thinkcollege.net/college-search>

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Peer-Assisted Learning Strategy (PALS) to Address Reading Challenges in a Second-grade Student with Autism Spectrum Disorder

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Abstract: Students with autism spectrum disorder (ASD) are frequently included in general education classrooms and as a result are expected to access the grade-level curriculum through reading. Although a number of students with ASD experience challenges in reading decoding, fluency, and comprehension, research on best practice reading interventions for this group is only emerging and somewhat limited. One promising approach to develop reading skills in students with reading difficulties is peer assisted learning strategy (PALS) instruction, whereby children work together or with an adult to support learning. In this study, we examined the effect of a PALS reading intervention implemented with two second-grade students with ASD, specifically targeting the phonemic awareness, fluency, and reading comprehension skills of one student. Results of this multiple baseline study are described along with implications for teacher practice and research addressing reading challenges among students with ASD.

Children with autism spectrum disorder (ASD) are known to be at risk for reading difficulties (Nation, Clarke, Wright, & Williams, 2006), with a majority of children with ASD demonstrating challenges in reading comprehension, and possessing relative strengths word recognition (or decoding) abilities (Mayes & Calhoun, 2003a, 2003b; Westerveld, Trembath, Shellshear, & Paynter, 2016). Comparable to the developmental characteristics associated with ASD, reading ability is also highly variable (Nation et al., 2006). For instance, individuals with high-functioning ASD may acquire average or above average decoding ability, and accurately identify facts from text, but have difficulty making inferences (Griswold, Barnhill, Myles, Hagiwara, & Simpson, 2002) particularly regarding the intentions and emotions of others, due to impairments in abstract reasoning (Randi, Newman, & Grigorenko, 2010) and language

ability (Colle et al., 2008). Moreover, some children with ASD will struggle with both word identification and comprehension skills (Mayes & Calhoun, 2003a, 2003b; Nation et al., 2006). Some children with ASD also have difficulty with the pragmatic aspects of language, such as communicative intentions and social contexts, and so it is not surprising that comprehension presents unique challenges for these students (Randi et al., 2010).

In fact, among students with ASD with measurable reading skills, Nation et al. (2006) found comprehension difficulties in more than 65% of this group. However, a closer inspection of the Nation study indicates challenges with decoding as well. Specifically, their findings suggested a substantial number of the sample children were unable to read single words out of context, and, among those who were able to

decode single words, a little more than half showed appropriate decoding skills, while the remaining students showed below average performance, indicating that reading difficulties in children with ASD were not confined to comprehension alone. These results suggest that a significant proportion of children with ASD struggle with decoding and that their reading abilities cannot be predicted solely by their oral language skills (Westerveld et al., 2016).

In summary, a heterogeneous pattern of reading skills in children with ASD exists (Westerveld et al., 2016). Since some students with ASD may struggle with word-level reading, and an even greater number with reading comprehension (Williamson, Carnahan, & Jacobs, 2012), determining best practice reading interventions is critical for improving the literacy skills of children with ASD (Randi et al., 2010). Because children with ASD are often educated within the general classroom (NCLB 2001), it is important that reading comprehension instruction be an essential component of the curriculum and research agenda. Despite the need for best practice interventions, there is relatively little research in the area of literacy development in children with ASD (Westerveld et al., 2016) and only a few published studies investigating reading comprehension specifically (Randi et al., 2010; Regelski, 2016).

Peer-Assisted Learning Strategies (PALS)

Children with ASD require specialized interventions to address deficits in communication, social interaction, and learning (Matson, 2008). In peer-mediated intervention (PMI), peers (e.g., classmates) are trained to act as the intervention agents, and facilitate instructional programs, behavioral interventions, and social interactions (Laushey & Heflin, 2000). Peer-mediated learning strategies are supported by

a broad research base for children with ASD, can be used across a range of ages or contexts, and are helpful in teaching a variety of target behaviors (Sperry, Neitzel, & Engelhardt-Wells, 2010). In a systematic analysis of studies focused on the use of PMI in the treatment of individuals with ASD (Chan et al., 2009), 42 studies reviewed suggested PMI is a useful and effective intervention approach for individuals with ASD. Researchers also demonstrated the efficacy of the intervention for children from preschool through high school; in private, public, clinical, and community-based settings; and with individuals across the spectrum of disability severity (Sperry et al., 2010).

One strategy that encompasses a collaborative, peer-mediated approach and found to increase reading fluency and reading comprehension in individuals with ASD and their peers is Class-Wide Peer Tutoring (Kamps, Barbeta, Leonard, & Delquadri, 1994). CWPT is a peer-mediated teaching strategy in which students work together in peer-tutoring pairs (Kamps et al., 1994). A specific, peer-mediated CWPT program that has shown a positive impact on beginning reading skills (Rafdal, McMaster, McConnell, Fuchs, & Fuchs, 2011) and can significantly increase the reading comprehension skills of students with disabilities (Fuchs, Fuchs, & Kazdan, 1999) is Peer-Assisted Learning Strategies, or PALS. PALS (Fuchs & Fuchs, 1999) is a peer-mediated instructional program that supplements reading curriculum. Pairs of students (or student and teacher) work together on reading activities to improve reading accuracy, fluency, and comprehension. Students work in pairs, alternating roles of tutor and tutee, read aloud, listen to their partner read and provide feedback during structured activities.

PALS has a robust evidence base as effective for students with reading challenges (Fuchs, Fuchs, Mathes, & Martinez, 2002; Fuchs, Fuchs, & Burish, 2000), has been shown to positively impact the beginning reading skills of many children (Rafdal et al., 2011) and can significantly increase the reading comprehension skills of students with disabilities (Fuchs et al., 1999). Rafdal et al. (2011) conducted a large-scale multisite study to determine the effectiveness of K-PALS for students with disabilities. K-PALS was effective for increasing initial alphabetic principal and decoding skills for students with disabilities who were included in general education classrooms for classroom-based reading instruction. These results are consistent with previous findings, which have demonstrated K-PALS effectiveness for students in the general education population (Fuchs et al., 2001, 2008).

Although PALS is a scientifically based, supplemental, peer-mediated program associated with positive results, the research indicates that PALS has been primarily implemented with English language learners or students with learning disabilities (Calhoun, 2005; Fuchs et al., 1999; Rafdal et al., 2011; Sáenz, Fuchs, & Fuchs, 2005). The impact of PALS on the reading skills of students with ASD has not been investigated extensively. Recently, Regelski (2016) investigated the effects of PALS on reading fluency and reading comprehension using a single-subject, multiple baseline design across participants for three students with ASD. Results demonstrated that all three students increased their reading comprehension and two increased their reading fluency (Regelski, 2016). Though promising, more research is needed to evaluate the impact of PALS on the reading skills of these students.

Method

The purpose of this study was to evaluate the effect of PALS, an evidence-based reading intervention, on the literacy skills of a struggling reader with ASD. Two second grade students with ASD were selected to take part in this study. The first student Matt, struggled with social skills and task avoidance, and the second student, Nick, struggled with decoding, reading fluency, and reading comprehension. Nick received PALS delivered by Matt with the assistance of an interventionist over a 5-week period. A multiple baseline design across reading responses (e.g., decoding, fluency, and comprehension) was employed to evaluate the effectiveness of the PALS intervention.

Participant and Setting

At the time of the study, Nick and Matt were both 8-years old. Both students attended a public elementary school for the first two years of their education and then transferred into a private elementary school at the beginning of second grade. At the public elementary school, Nick and Matt had individualized education plans, and they received services focusing on reading and writing instruction for Nick, and mathematics and social skills training for Matt. Both students received speech and both students were placed in general education classes with pull-out intervention services.

The private school served students in preschool through eighth grade and at the time of this study, the school had approximately 250 students enrolled. Both students lived with their parents and siblings in a large suburban neighborhood in the Western United States. The private school serviced all students in the general education classroom but differentiated classroom instruction for students with different needs. Also, the private school modified grade level work to focus on providing instruction at the functional levels of their students.

Prior to the first baseline session, the second author met with Nick’s classroom teachers and reviewed Nick’s reading assessment results. During this meeting, the researcher and the teachers reviewed classroom-based reading data, as well as the results of the Woodcock Johnson Test of Achievement III subtests on letter word identification, reading fluency, spelling, passage comprehension, and word attack. Curriculum-based measures were also used that focused on measuring progress in word fluency, reading fluency, and reading comprehension. The results of Nick’s baseline reading assessment are provided in Table 1.

Following baseline assessments, Nick and Matt received eight, fifteen-minute PALS training lessons that taught them how to prepare for PALS and how to work collaboratively during the PALS intervention. The researcher followed each of the scripted PALS lessons that introduced the PALS rules, taught the students to say individual letter sounds, to segment words, to read sight words, how to handle PALS materials appropriately, and peer-mediated activities. For example, the first training lesson focused on introducing PALS by highlighting its advantages and benefits.

Although Nick required remedial reading interventions, the second student, Matt, had strengths in reading fluency and reading comprehension. However, he struggled demonstrating pro-social behaviors such as staying on task, initiating social interactions, responding to the initiations of others, and developing relationships or friendships with other students.

After the eight training lessons, the researcher and classroom teacher explained to both students how the peer mediated PALS reading interventions would help improve both students’ reading abilities by focusing on the instructional components of the PALS lessons. In addition, the researcher also defined terms that were specific to PALS (e.g., Coach, Reader, peer pairing), and encouraged good student behavior. Nick and Matt were also taught the PALS rules that required them to only talk to one another and to only talk about PALS, to keep their voices low, help one another, and try their best. The researcher provided reminders of these rules, and redirected Nick and Matt when they were off-task. Prior to the intervention phase, Nick and Matt learned the PALS procedures and how to perform the Sounds and Words activities. The training sessions occurred four times each week and lasted

Table 1. *Woodcock Johnson Test of Achievement Pre-Assessment*

Woodcock Johnson III Subtests	RAW	W	Easy-Difficult	RPI	<u>SS (68% Band)</u>	Age Equivalent
Letter-Word Identification	27	420	1.4 1.9	8/90	81 (78-83)	6-11
Reading Fluency	0	460	<K.0 1.6	38/90	66 (45-86)	<4-1
Spelling	12	412	K.1 K.7	0/90	51 (45-57)	5-8
Passage Comprehension	14	450	1.1 1.6	17/90	73 (69-78)	6-8
Word Attack	2	398	K.0 K.5	0/90	53 (46-61)	5-7

between 15 and 30 minutes. Afterwards, Nick and Matt worked together to complete the tutoring routine that was previously taught. Following the completion of the teacher and student training sessions, the first-grade reading PALS program was selected based on the pre-assessment results that were conducted with Nick prior to baseline. Following the PALS training sessions, a five-week intervention was implemented that consisted of five 35-minute sessions per week. Interventions were applied sequentially and cumulatively to the three target behaviors (word fluency, reading fluency, and reading comprehension) over the five-week period.

In sum, a five-week intervention phase using one 35-minute PALS intervention per weekday was delivered in the general education second grade classroom during allocated reading time. Each of the three classroom teachers taught their students in small groups during reading time, so the PALS intervention was conducted with the two students in their natural learning environment during a designated reading block.

Procedure

Setting description. All experimental sessions, including baseline and treatment were conducted in the student's second grade general education classroom. The classroom had 28 students, two teachers, and an instructional assistant. PALS started as a natural part of the classes 90-minute reading block which consisted of teachers working with students in small groups to target specific skill deficits. This allowed Nick and Matt to transition in and out of the intervention seamlessly.

Description of the intervention. PALS Reading is a structured, peer-mediated reading activity appropriate for students in

preschool through sixth grade. To use PALS, all students in a class are divided into pairs and each member of the pair takes turns being the reading coach and the reader. As the reader reads aloud, the coach listens and provides corrective feedback. PALS is designed to supplement a teacher's existing reading program for 35 minutes a day with four to five sessions per week (for more details see

<http://vkc.mc.vanderbilt.edu/pals/index.html>).

The first part of the intervention focused on improving Nick's phonemic awareness. The intervention targeted individual phoneme sounds in isolation, blending letter sounds to decode words, and reading individual words. To start, Nick blended individual phonemes together to come up with a word (e.g., /m/ + /i/ + /t/ + /t/ = mitt). Using the PALS first grade lessons, Nick started by decoded two-phoneme words to four-phoneme words and then five phoneme words to six phoneme words. After he demonstrated mastery of his ability to read words with five or six phonemes, Nick again concentrated on letter sounds by orally stating individual letter sounds of a word. For example, when the teacher says a word (e.g. sad), the student segmented the phonemes within the word and orally told the teacher the letter that represents each phoneme. Phoneme recognition in isolation improves the ability of a child or non-reader to recognize consonant and short vowel sounds and aids in the decoding of unknown words (Burke, Crowder, Hagan-Burke, & Zou, 2009).

The second part of the lesson focused on improving the student's reading fluency. PALS Oral Reading in Context (ORC) was used to improve and monitor Nick's oral reading fluency throughout the intervention. The ORC yields three measures of oral reading fluency: (a) oral reading accuracy, (b) phrasing, intonation, and expression, and (c) reading rate. Using a 100-word chart to

maintain a running record, the ORC was administered daily for two weeks with Nick using reading passages at a beginning first grade level with at least 100 words.

Reading comprehension was assessed and monitored using PALS oral reading in context. After reading a passage out loud, Nick answered a set of comprehension questions that were derived from the reading passage. The comprehension questions were in a multiple-choice format and the researcher read the questions and the answer options aloud to Nick.

Empirical Design and Instrumentation

A multiple baseline design across reading responses (word fluency, reading fluency, and reading comprehension) was used to assess the effects of the intervention. Baseline lengths were one, two, and three weeks and the study participant was video recorded during baseline and intervention phases.

Baseline measures. During baseline sessions, the experimenter used the Phonological Awareness Literacy Screener Plus Level A (PALS) to measure Nick's knowledge of literacy fundamentals such as oral passage reading, word recognition in isolation, spelling and morphology, alphabet knowledge and letter sounds, phonological awareness, and word concepts (see Table 2). Once the screener was completed, the results identified specific skill deficits with word recognition in isolation (word fluency), deficits in reading fluency with overall word accuracy and fluency, and deficits in reading comprehension.

Dependent measures. Word fluency, reading fluency, and reading comprehension were the three dependent variables examined in this study. Each dependent variable was measured over the course of the 5-week study

using curriculum-based measures that were obtained from the easyCBM online system developed by the University of Oregon (www.easycbm.com). Easy CBM provides users with systematic assessments across grade levels that focus on reading and mathematics concepts that include individual student progress reports that support evidence-based decision-making. Curriculum-based measures have been identified as providing exceptionally high levels of diagnostic accuracy for screening performance for a wide variety of reading skills (Keller-Margulis, Shapiro, & Hintze, 2008; Reschly, Busch, Betts, Deno, & Long, 2009). Furthermore, the data gathered from CBM measures have been used for a variety of purposes in general, remedial, and special education and several studies indicate that when CBM data is used to monitor student performance and guide instructional interventions, student achievement is raised (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999; Bain & Garlock, 1992; Fuchs & Fuchs, 1999).

Pre-assessment data was collected using the Woodcock Johnson Tests of Achievement III subtests on letter-word identification, reading fluency, spelling, passage comprehension, and word attack indicated that Nick was reading at a Kindergarten level. Therefore, CBM's focusing on word fluency, reading fluency, and reading comprehensions were selected to measure his progress during the 5-week intervention. Word recognition was assessed using CBMs that focused on word reading fluency starting at the K.3 grade equivalent and continued for the duration of three-week intervention and increased to the K.17 grade equivalent.

Reading fluency data were assessed daily using a CBM that concentrated on passage

Table 2. *PALS first grade screener results*

PALS Tasks	Individual Score	Maximum Score
Entry Level		
Spelling Inventory	7/20	20/20
Word Recognition	8/20	20/20
Level A		
Oral Reading in Context		
Oral Reading Fluency	30% on 1 st grade passage	100% accuracy on 1 st grade passage
Comprehension	1/6 questions answered correctly	6/6 questions answered correctly
Level B		
Alphabet		
Alphabet Recognition	26	26
Letter Sounds	24	26
Concept of a Word	25	25
Level C		
Blending	12	20
Sound to Letter	24	40

fluency beginning at a 1.1 grade equivalent and continuing for 4 weeks, ending at a 2.3 grade equivalent. Reading fluency was measured by the minute and evaluated Nick's reading speed and reading accuracy. High levels of reading fluency are strong indicators of a student's overall reading competence, which includes reading comprehension (Fuchs, Fuchs, Hosp, & Jenkins, 2001).

The third dependent variable, reading comprehension, was also continuously assessed during the 5-week intervention using CBMs starting at a 1.1 grade equivalent and continuing for four weeks and ending at the 2.13 grade equivalent. Reading comprehension was measured by having Nick read a short story on his own and answer five questions independently. Percentage scores were interpreted by subtracting the number of incorrect answers from the total number of possible answers, (five) and dividing that number by five.

Treatment fidelity. To assess the accuracy with which PALS was implemented, an observer completed a procedural checklist for all sessions. The researcher trained the classroom teachers how to record data using the PALS implementation integrity observation checklist. Inter-rater reliability was calculated on the scores by having the classroom teachers score PALS tasks simultaneously with the researcher while he was administering them. To teach word recognition in isolation, oral reading fluency, and reading comprehension, the classroom teacher administered and scored the appropriate sections of PALS, following the same directions provided in the PALS Teacher's Manual. After testing was complete, the two scores were compared, and inter-rater reliability was determined using Pearson correlation coefficients. Correlations ranged from .923 to .992 ($p < .01$). High inter-rater reliability coefficients are indicative of accurate and reliable scores.

Finally, the researcher shared the first-grade PALS reading materials with the teachers and explained how the materials would be used during the intervention.

Results

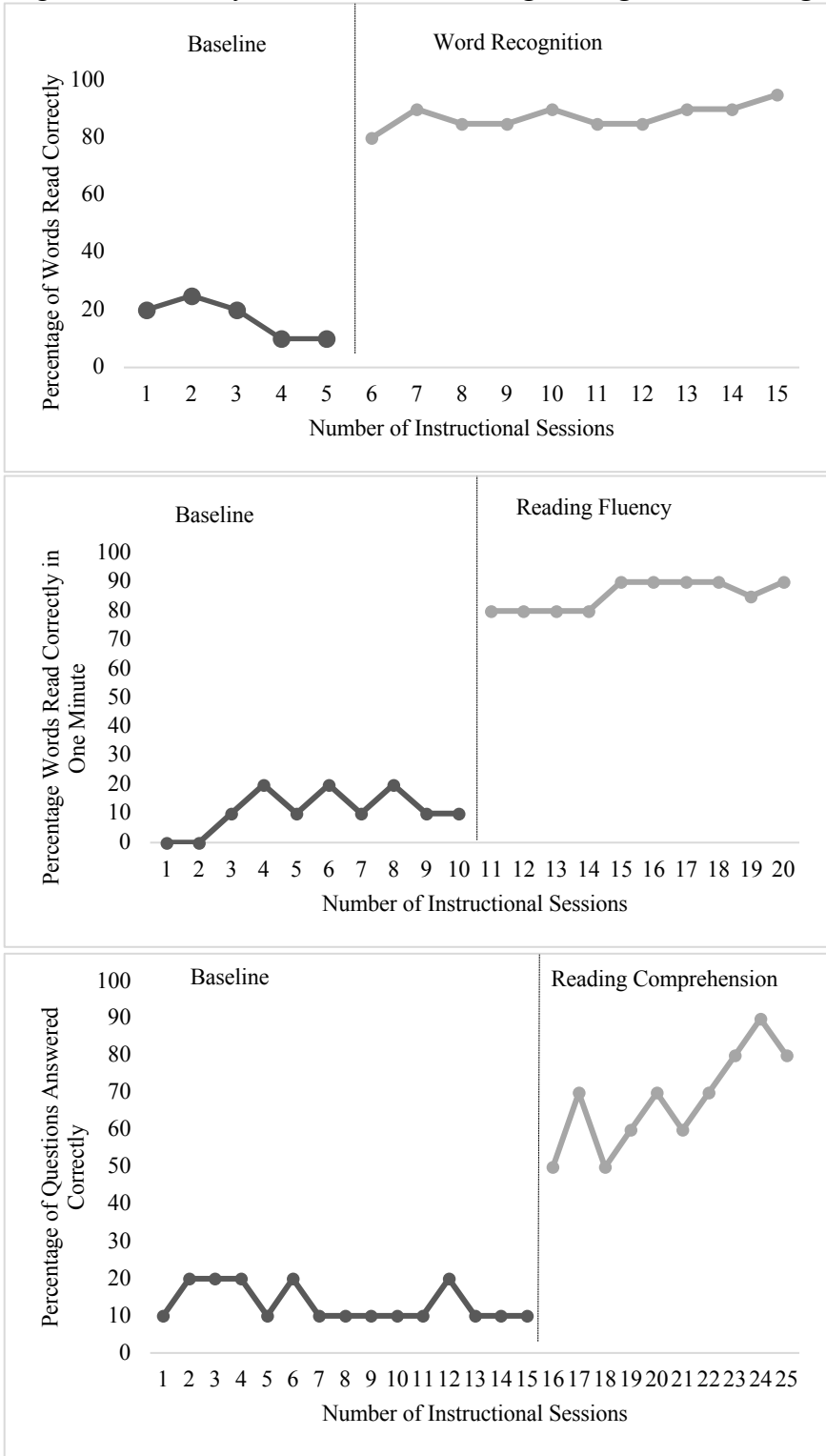
A standard line graph was used to display all data for the study participant across reading behaviors. Using the line graph provides an important advantage for teachers and researchers by permitting an initial visual analysis of the data collected during the course of the study. This in turn allows teachers and researchers to see whether or not a study participant is indeed making progress. In addition, the line graph has an advantage of showing change over time and can even show small changes over time. The results of Nick's performance are depicted in figure 1. Visual analysis suggests a functional relationship between Nick's reading performance across all three-skill areas and the PALS intervention. Specifically, the results indicate that peer assisted learning generated considerable improvement in Nick's word fluency, reading fluency, and reading comprehension. As illustrated during the baseline phase, Nick's reading skills were relatively weak, stable and descending across all three reading targets.

Nick struggled to decode unknown words and often struggled with his semantic and phonemic fluency. He would chunk sounds orally and say the correct initial sound of the word, but pair it with an incorrect word. For example, when Nick was asked to read the word 'him,' Nick would orally read 'his.' These types of mistakes may demonstrate a lack of cipher knowledge, but also an inability to decode words with proper automaticity. Nick's word fluency level during a five-day baseline phase averaged only 17% accuracy. However, during the intervention, Nick demonstrated marked

growth in word fluency. One aspect of the PALS reading intervention focused on teaching Nick how to segment individual letter sounds in a word. The researcher would segment the word by individual letters sounds and then read to word. Then, the researcher would ask Nick to segment the word by letter sounds and then to read the entire word. Teaching Nick to segment the words appeared to have helped him substantially as his word fluency increased from a 17% accuracy level to an 87% accuracy level, an increase of seventy percent.

In reading fluency, Nick struggled during baseline to read a short story within one minute. Nick was able to read just 11% of the words in a short story during the baseline phase of the study. During baseline for reading fluency it was noted by the researcher that Nick struggled with automaticity and he often skipped words or mispronounced them entirely. He was also a very slow reader, which contributed to his low scores. In each of the PALS first grade lessons, there is a reading stories section of the lesson in which the reading coach and Nick would take turns reading the short story. The story was always read first by the coach and as the coach read, Nick would follow along with his fingers and eyes focused on the words in the sentence. After the coach read the story, Nick took a turn and, any time he made a mistake, the coach would tell Nick the following "Stop, that word is _____. What's the word?" Then Nick would read the word correctly and start the sentence over. Each student took turns reading the story three times each. Nick's reading fluency levels increased from reading only 11% of the words in a story during baseline to being able to read 87.5% of the words in a story at a first-grade level correctly following the intervention phase.

Figure 1. Results of Peer Assisted Learning Strategies on Reading Skill Targets



Nick’s reading comprehension ability was also identified in the pre-assessment report as being very low. Therefore, comprehension was targeted using the reading strategies outlined in the second-grade PALS that included teaching the two students to make predictions before reading a story, to use partner reading to take turns reading a story, to retell the story to their partner after reading it, and to summarize the story. Using the second-grade PALS reading strategies together with his reading coach, Nick’s ability to read a short story and recall information and answer questions correctly also increased. Although Nick’s reading comprehension skills did not evidence as large of an improvement as did his word fluency or reading fluency skills, he was still able to improve his comprehension from a baseline level of 20% accuracy on questions answered to 75% accuracy on questions posed to him after having a read a short story.

The PALS intervention increased Nick’s word fluency, reading fluency, and reading comprehension skills substantially, with a

range of improvements including a 70% increase in word fluency, a 74.5% increase for reading fluency, and a 55% increase for reading comprehension. The greatest rates of increase in word fluency and reading fluency were noted, although Nick continued to make noticeable gains in reading comprehension. In addition, standardized assessments conducted before and after the intervention provide corroborating evidence of Nick’s gains, as measured in grade-equivalent and age-equivalent scores, along a number of key reading targets.

Discussion

The purpose of this study was to determine the effectiveness of Peer Assisted Learning Strategies (PALS) on the reading skills (word fluency, reading fluency, and reading comprehension) of a second-grade student with ASD in an inclusive second grade classroom. The PALS intervention examined herein was an effective approach for producing positive changes in Nick’s decoding, fluency, and comprehension. Moreover, these gains are consistent with

Table 3. Comparison of Pre-test and Post-test Woodcock Johnson III Reading Scores

Woodcock Johnson III Reading Subtests	<u>Pre-SS (68% Band)</u>	<u>Pre-Grade Equivalent</u>	<u>Pre-Age Equivalent</u>	<u>Post-SS (68% Band)</u>	<u>Post-Grade Equivalent</u>	<u>Post-Age Equivalent</u>
Letter-Word Identification	81 (78-83)	1.4 1.9	6-11	101 (99-104)	2.7 3.4	8-4
Reading Fluency	66 (45-86)	<K.0 1.6	<4-1	89 (84-94)	1.3 3.3	7-5
Spelling	51 (45- 57)	K.1 K.7	5-8	82 (78-87)	1.5 2.2	7-1
Passage Comprehension	73 (69-78)	1.1 1.6	6-8	82 (78-87)	1.5 2.2	7-1
Word Attack	53 (46-61)	K.0 K.5	5-7	90 (87-93)	1.7 2.4	7-4

previous research conducted with students with learning disabilities and English language learners (Calhoun, 2005; Fuchs et al., 1999, 2002; Rafdal et al., 2011, Sáenz et al., 2005). However, Nick made better-than-anticipated gains in his reading skills. During baseline, Nick struggled with decoding high frequency words. He often would orally state the initial letter sound and simply guess at the word based on its initial sound. Furthermore, Nick's reading fluency suffered from his inability to decode an entire word letter by letter, and the overall rate at which he read was very slow. These factors contributed to his low scores in reading comprehension.

After the PALS strategy was introduced, Nick's reading skills grew rapidly, and during the intervention phase, Nick took his time to decode the initial, medial, and final letters sounds in words. As a result, his reading fluency increased and because he was able to read more confidently and with accuracy, he began to understand more of what he read. The results of this study show the PALS intervention resulted in improvements across reading skills (i.e., word fluency, reading fluency, and comprehension) as measured using CBMs across reading behaviors. However, the results of this study should be interpreted with careful consideration given the time span of the intervention and the use of a single-subject design.

The results of this study have several practical implications for professionals working with students with autism who also have difficulty with reading. First, the use of PALS as a reading intervention for struggling readers is well documented in the literature (Fuchs, Fuchs, Mathes, & Simmons, 1997; Fuchs et al., 2006; Fuchs & Fuchs, 2007). Furthermore, the use of PALS as a reading intervention for students with learning disabilities has demonstrated significant

promise (Fuchs et al., 1997; Allor, Fuchs, & Mathes, 2001; Calhoun, Otaiba, Cihak, King, & Avalos, 2007; Calhoun, 2005). Yet, the implementation of PALS as a reading intervention for struggling readers with ASD is nascent. More studies are needed to support the implications of this research that concluded that PALS is useful as a reading intervention for students with ASD.

Limitations

Despite demonstrating promising results, the current investigation presents some limitations. Only 25 PALS sessions (approximately 5 weeks) were conducted with the target student. Some previous studies implementing the use of PALS for students with disabilities conducted sessions for substantially longer periods of time (e.g., 15 weeks to 2 years; Calhoun, 2005, Rafdal et al., 2011; Sáenz et al., 2005). More time to conduct the study would provide greater understanding of the full impact of the PALS intervention on the student's reading skills. In addition, since a single-subject design does not permit a comparison of performance across students, it is not possible to determine whether the interventions would be successful with other children with ASD. Moreover, a threat to validity in single-subject designs is small sample size. A clear weakness of the present study is the participation of one only student. Future research should employ multiple baseline designs with several students with ASD and, when possible, group designs with a larger number of participants. Finally, maintenance and generalization were not adequately assessed in this study. It is important that the long-term implementation of PALS and other reading interventions be explored under a variety of conditions in future studies with students with ASD. Though these limitations exist, PALS may produce positive academic outcomes (e.g., word decoding, fluency, and comprehension) in an elementary student

with ASD and shows emerging promise for students with similar reading profiles.

Finally, at the beginning of this study, Nick was reading a grade and a half below grade level. During classroom observations, it was noted that the classroom teachers were using grade level Dolch high frequency words to increase his vocabulary and his reading ability. However, no remedial reading interventions were offered to Nick. Furthermore, none of the classroom reading instruction concentrated on teaching Nick how to decode words effectively and there was no instruction that focused on improving reading fluency or reading comprehension. These issues are believed to be factors that maintained Nick's struggles with reading.

Future Directions and Conclusion

Acquiring literacy skills represents just one of many challenges faced by children with ASD, given the pervasive and complex nature of the disorder. Yet, given that learning to read begins in the early developmental period and is intricately linked to academic outcomes, there is a strong case for it being given greater emphasis in early intervention programs for children with ASD and in the overall research

agenda for this population. There is relatively limited research on reading strategies for individuals with ASD and only a few published investigations on reading comprehension specifically (Regelski, 2016). Despite the success of studies on the impact of PALS on students with learning disabilities, questions remain regarding the effects of PALS on reading comprehension and reading fluency for students with ASD. Additional replication studies are needed in order to validate and extend these results.

PALS research over the past 15 years has primarily focused on English language learners or students with learning disabilities. The results of the current study add to the literature base and support the use of PALS for students with disabilities (e.g., Calhoon, 2005; Fuchs et al., 1999, 2002; Rafdal et al., 2011, Sáenz et al., 2005). However, studies investigating the effects of PALS on students with ASD remain limited. Further research on the effectiveness of PALS for students with ASD in both reading comprehension and reading fluency across grade levels would be useful to inform best practices for this growing population of learners in schools.

References

- Allor, J. H., Fuchs, D., & Mathes, P. G. (2001). Do students with and without lexical retrieval weaknesses respond differently to instruction? *Journal of Learning Disabilities, 34*, 264-275.
- American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1999). *Standards for educational and psychological testing*. Washington, DC: AERA.
- Bain, S. K., & Garlock, J. W. (1992). Cross-validation of criterion-related validity for CBM reading passages. *Diagnostique, 17*, 202-208.
- Burke, M. D., Crowder, W., Hagan-Burke, S., & Zou, Y. (2009). A comparison of two path models for predicting reading fluency. *Remedial and Special Education, 30*, 84-95.
- Calhoon, M. B. (2005). Effects of a peer-mediated phonological skill and reading comprehension program on reading skill acquisition for middle school students with reading disabilities. *Journal of Learning Disabilities, 38*, 424-433.

- Calhoon, M. B., Al Otaiba, S., Cihak, D., King, A., & Avalos, A. (2007). Effects of a peer-mediated program on reading skill acquisition for two-way bilingual first-grade classrooms. *Learning Disability Quarterly, 30*, 169-184.
- Chan, J., M., Lang R., Rispoli M., O'Reilly M., Sigafos J. & Cole, H. (2009). Use of peer-mediated interventions in the treatment of autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders, 3*, 876-889.
- Colle, L., Baron-Cohen, S., Wheelwright, S., & van der Lely, H. K. (2008). Narrative discourse in adults with high-functioning autism or Asperger Syndrome. *Journal of Autism and Developmental Disabilities, 38*, 28-40.
- Fuchs, D., Fuchs, L. S., Al Otaiba, S., Thompson, A., Yen, L., McMaster, K. N., ... Yang, N. J. (2001). K-PALS: Helping kindergartners with reading readiness: Teachers and researchers in partnerships. *Teaching Exceptional Children, 33*(4), 76-80.
- Fuchs, D., Fuchs, L. S., & Burish, P. (2000). Peer-assisted learning strategies: An evidence-based practice to promote reading achievement. *Learning Disabilities Research and Practice, 15*, 85-91.
- Fuchs, D., Fuchs, L. S., Simmons, D. C., & Mathes, P. G. (2008). *Peer Assisted Learning Strategies: Reading methods for grades 2-6*. Nashville, TN: Vanderbilt University, Print.
- Fuchs, D., Berends, M., Yen, L., Fuchs, L., Compton, D., Saenz, L., & McMaster, K. (2006). *What teacher supports are necessary to scale up PALS-reading? A multi-site randomized control trial*. Nashville, TN: Vanderbilt Kennedy Center.
- Fuchs, D., Fuchs, L. S., Mathes, P. G., & Simmons, D. C. (1997). Peer-Assisted Learning Strategies: Making classrooms more responsive to diversity. *American Educational Research Journal, 34*, 174-206.
- Fuchs, L. S., & Fuchs, D. (1999). Monitoring student progress toward the development of reading competence: A review of three forms of classroom based assessment. *School Psychology Review, 28*, 659-671.
- Fuchs, L. S., Fuchs, D., & Kazdan, S. (1999). Effects of peer-assisted learning strategies on high-school students with serious reading problems. *Remedial and Special Education, 20*, 309-318.
- Fuchs, L. S., Fuchs, D., Hosp, M. K., & Jenkins, J. R. (2001). Oral reading fluency as an indicator of reading competence: A theoretical, empirical, and historical analysis. *Scientific Studies of Reading, 5*, 239-256.
- Fuchs, D., Fuchs, L. S., Mathes, P. G., & Martinez, E. (2002). Preliminary evidence on the social standing of students with learning disabilities in PALS and No-PALS classrooms. *Learning Disabilities Research and Practice, 17*, 205-215.
- Fuchs, D., & Fuchs, L. S. (2007). Increasing strategic reading comprehension with peer-assisted learning activities. In D. McNamara (Ed.), *Reading comprehension strategies: Theories, interventions, and technologies* (pp. 175-197). Mahwah, NJ: Lawrence Erlbaum.
- Griswold, D. E., Barnhill, G. P., Myles, B. S., Hagiwara, T., & Simpson, R. L. (2002). Asperger syndrome and academic achievement. *Focus on Autism and Other Developmental Disabilities, 17*, 94-102.
- Kamps, D. M., Barbeta, P. M., Leonard, B. R., & Delquadri, J. (1994). Classwide peer tutoring: An integration strategy to improve reading skills and promote peer interactions among students with autism and general education peers. *Journal of Applied Behavior Analysis, 27*, 49-61. doi: 10.1901/jaba.1994.27-49

- Keller-Margulis, M. A., Shapiro, E. S., & Hintze, J. M. (2008). Long-term diagnostic accuracy of curriculum-based measures in reading and mathematics. *School Psychology Review, 37*, 374-390.
- Laushey, K. M., & Heflin, L. J. (2000). Enhancing social skills of kindergarten children with autism through the training of multiple peers as tutors. *Journal of Autism and Developmental Disorders, 30*, 183-193.
- Matson, J. L. (Ed.). (2008). *Clinical assessment and intervention for autism spectrum disorders*. Amsterdam: Academic Press.
- Mayes, S., & Calhoun, S. (2003a). Ability profiles in children with autism. *Sage Publications and the National Autism Society, 6*(4), 65-80.
- Mayes, S. D. & Calhoun, S. L. (2003b). Analysis of WISC-III, Stanford-Binet-IV, and academic achievement test scores in children with autism. *Journal of Autism and Developmental Disorders, 33*, 329-341.
- Nation, K., Clarke, P., Wright, B., & Williams, C. (2006). Patterns of reading ability in children with autism spectrum disorder. *Journal of Autism Development Disorder, 36*, 911-919.
- No Child Left Behind Act of 2001, P.L. 107-110, 20 U.S.C. § 6319 (2002).
- Rafdal, B. H., McMaster, K. L., McConnell, S. R., Fuchs, D., & Fuchs, L. S. (2011). The effectiveness of kindergarten peer-assisted learning strategies for students with disabilities. *Exceptional Children, 77*, 299-316.
- Randi, J., Newman, T., & Grigorenko, E. (2010). Teaching children with autism to read for meaning: Challenges and possibilities. *Journal of Autism and Developmental Disabilities, 40*, 890-902.
- Regelski, R. (2016). *The effectiveness of Peer-Assisted Learning Strategies on reading comprehension for students with autism spectrum disorder*. Unpublished Doctoral Dissertation, University of Pittsburgh.
- Reschly, A. L., Busch, T. W., Betts, J., Deno, S. L., & Long, J. D. (2009). Curriculum-based measurement oral reading as an indicator of reading achievement: A meta-analysis of the correlational evidence. *Journal of School Psychology, 47*, 427-469.
- Saenz, L. M., Fuchs, L. S., & Fuchs, D. (2005). Peer-assisted learning strategies for English language learners with learning disabilities. *Exceptional Children, 71*, 231-247.
- Sperry, L., Neitzel, J., & Engelhardt-Wells, K. (2010). Peer-mediated instruction and intervention strategies for students with Autism Spectrum Disorders. *Preventing School Failure, 54*, 256-264.
- Westerveld, M. F., Paynter, J., Trembath, D., Webster, A. A., Hodge, A. M., & Roberts, J. (2017). The emergent literacy skills of preschool children with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 47*, 424-438.
- Williamson, P., Carnahan, C. R., & Jacobs, J. A. (2012). Reading comprehension profiles of high-functioning students on the autism spectrum: A grounded theory. *Exceptional Children, 78*, 449-469.

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Privilege, Social Identity and Autism: Preparing Preservice Practitioners for Intersectional Pedagogy

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Abstract: This manuscript challenges the biomedical model of autism by examining autism from a socio-political model of disability related to disability studies, social justice, and intersectional pedagogy. An individual's identity is multifaceted, and a person may experience marginalization through oppressions that impact multiple aspects of their identity beyond their disability. This kind of intersectionality, recognizes that these systems of social power lead to social privilege and marginalization. Intersectional pedagogical practices help educators interrogate how their perceptions of autism were socialized and how that socialization intentionally or unintentionally affects students with autism and the ability to be creative when recognizing multiple layers of identity.

By defining policy for K-12 special education in the United States, the Individuals with Disabilities Education Improvement Act (IDEA) has afforded students with disabilities rights to an education. The 1990 reauthorization of IDEA officially recognized autism as the 13th eligibility category for specialized educational services (IDEA, 2004). As more students with autism participate in inclusive learning environments and graduate from high school, more students with disabilities are also pursuing higher education and lifelong learning (Damiani & Harbour, 2015). However, individuals with disabilities experience discrimination in various areas of life, including education and employment (World Health Organization, 2011). According to the Autism Research Institute (2019), many students with autism are marginalized by the school system. Many are able to achieve academically at the same or higher levels than their typical peers (Autism Speaks, 2012; Camarena & Sarigiani, 2009; Chiang, Cheung, Hickson, Xiang, & Tsai, 2012), but in 2012, only 34.7% of students

with autism attempted to even go to college (Shattuck et al., 2012).

Disability is defined by the Americans with Disabilities Act (ADA) and policies of the World Health Organization (WHO) as a physical, mental, emotional, or functional limitation. Traditionally, the field of education has also used this type of legal and biomedical definition of disability (Association on Higher Education and Disability, 2012; Cory, 2011). According to IDEA (2004), the definition of autism is, “a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, which adversely affects a child's educational performance.” However, the field of disability studies also defines disability as a social construction like gender and race; and disability can even become an identity and source of community— a very different definition than the traditional medical and legal version (Asch, 2001).

Intersectionality is an important framework to understand how converging aspects of an individual's identity can contribute to inequality (Museus & Griffin, 2011, p. 10). In preservice practitioner training, using intersectionality as a framework for understanding disability identity brings into view interactions of oppression at work in the educational system. Biomedical studies of the etiology of autism have resulted in models that suggest that autism results from neuroanatomical differences between the male and female brain. The higher prevalence of autism diagnosed in males compared to females is an example how intersectionality influences autism. For example, the brain difference model (Baron-Cohen, 2004) includes the "extreme male brain" hypothesis positing that males may be more vulnerable to develop autism given that the characteristic traits result from an extreme form of the male pattern of neurodevelopment, and females may be less susceptible to autism because of their neurological predisposition for empathizing abilities and social competencies. However, Kreiser and White (2013) suggest, sociocultural influences may impact not only symptom presentation, but also the lens through which females with impairments associated with autism are perceived.

This manuscript examines how educational experiences guided by an intersectional approach should move preservice practitioners away from deficit notions of individuals and communities and toward recognition of structural inequities and the roles of multiple minoritized identities in the maintenance of social concerns (Damiani & Harbour, 2015; Mitchell, 2017). Intersectional pedagogy recognizes the assets of diverse learners and looks for opportunities to leverage available resources—individual, communal, and environmental—toward meaningful change.

Intersectionality

Initially, intersectionality emerged as a paradigm for understanding black women's subordinated social position and the situated effects of mutually constructing systems of power and oppression within black women's lives (Cooper, 2015), intersectionality highlights complexities of identity, marginalization, inequality, and power by recognizing the diversity of lived experiences. As a framework, intersectionality has been important for a variety of minoritized groups to contextualize their circumstances to promote visibility and inclusion (Crenshaw, 2015). The foundation of intersectionality emphasizes that identity, when viewed as singular and discrete, provides an incomplete picture that limits our ability to effectively work for and create change (Wijeyesinghe & Jones, 2014). The core tenets of intersectionality also tie the concept of identity to larger social structures related to power and inequality that are also intertwined (Dill & Zambrana, 2009; Weber, 2010; Wijeyesinghe & Jones, 2014). Intersectionality impacts individuals with autism who, in addition to identifying on the spectrum, also hold identities of race, socioeconomic status, religion, gender and/or sexuality that may also be minoritized.

Adopting intersectionality as a framework to explore social identity and privilege requires introspective reflection for confronting assumptions and stereotypes, owning unearned privilege, and facing inequality and oppression as something real human traits (Mitchell, 2008, p. 56). An intersectional framework reveals the structural and systemic injustice that shapes community problems (Cooper, 2015; Wijeyesinghe & Jones, 2014). It is useful, Cooper (2015) argued, for "exposing the operations of power dynamics in places where a single axis approach might render those operations invisible" (para. 39). To recognize

interconnected structures of inequality is to recognize the ways social systems of oppression including racism, classism, sexism, ableism and heterosexism interact and combine to create a set of social conditions that place people, especially those holding multiple minoritized identities, in perpetual social jeopardy (Cooper, 2015). If preservice practitioners are not mindful of intersectionality, they run the risk of limiting their understanding of how to best serve students with autism, dishonoring the lived experiences of students, and perpetuating societal stereotypes. Too often, differing abilities are seen as individual deficits.

Models of Disability

Disability has historically been viewed in social context as a personal tragedy or misfortune that requires charitable giving, pity, and paternalism from society (Siebers, 2008). Such a social perception has found its way into policies concerning people with disabilities, and contributed to, or perhaps caused, their marginalization (Asch, 2001, Siebers, 2008). Disability has thus been historically perceived as inherent to the individual as well as a tragedy or misfortune that a person has to overcome, notions known as the individual or medical model of disability (Ong-Dean, 2005). Preservice practitioners who are learning how to best serve students with autism must also explore how to work with the student's family. The medical model concept of autism as a diagnosis gives parents a way of explaining their children and advocating for them. Ong-Dean found that parenting literature promotes a medical model of disability that is more usable by certain parents—in particular, middle-class, white parents.

In higher education, disability is frequently relegated to disability awareness days, the curricula of special education, or discussed diagnostically in degree programs for health

care (Linton, 1998) and education professions. Faculty members and instructors with disabilities are also seldom represented in the curriculum. Both students with autism and their typically developing peers may be influenced by this hidden curriculum, but the particular tragedy for students with disabilities is that they may internalize the message that disability leadership and equality are irrelevant (Linton, 1998, p. 177).

Socio-political Model

Through a socio-political model of disability, disability studies scholars contend that disability including autism, is not an inherent problem located in the individual even though people with disabilities may have functional differences or impairments that differ from a biomedically-defined norm. Disability studies examines the way socially and culturally constructed problems and societal barriers, including attitudinal, environmental, and institutional, may prevent equitable participation in education and employment opportunities (Asch, 2001; Devlieger, Rusch, & Pfeiffer, 2003; Linton, 1998; Seibers, 2008). This kind of approach indicates that individuals with disabilities need to be recognized as the authority of their own experiences, as valued citizens capable of making equal contributions, and represented in positions of power within society. The experiences of disability oppression (i.e., ableism) may also interact with other aspects of identity, including race, gender, sexual orientation, class, and religion (Linton, 1998; McRuer, 2006; Vance, 2007).

Ableism

An ableist worldview, suggesting that people with disabilities should strive toward an able-bodied, neurotypical norm, reflects society's perceptions that certain abilities are essential to fully function in the world (Hutcheon & Wolbring, 2012). As a result, unintentional prejudicial attitudes and discriminatory

behaviors toward individuals with disabilities (Smith, Foley, & Chaney, 2008) go unquestioned. These perceptions create dysfunction when the accommodations provided for individuals with disabilities focus solely on their “disability,” neglecting other aspects of their identity, leading to systemic ableism (Pena, Stapleton, & Schaffer, 2016). Preservice practitioners should move away from viewing autism as a personal tragedy and relying on non-disabled “disability experts” for information and diagnoses.

Often the first step in understanding disability is coming to know its existence. Sommo and Chaskes (2013) identify multiple challenges associated with diagnoses. An individual can have multiple and overlapping diagnoses, disabling conditions can be situational or based on medicine regimes, and often a diagnosis is “premature, delayed, completely ignored, or accurately or inaccurately applied” (p. 50). The diagnostic process can be complicated and is not neutral. Factors such as classism, racism, and sexism play a role in the altering, delaying, and absence of a diagnosis for students. Such complications in the diagnostic process can be attributed to perceptions and intentional or unintentional biases. The Center for Disease Control and Prevention’s Autism and Developmental Disability Monitoring (ADDM) Network (2018) reported that in 2014, Hispanic and African American children were less likely to be identified with autism than white children. Christensen et al. (2018) suggests that observed prevalence differences of autism by race/ethnicity might reflect differences in awareness of autism or access to specialty diagnostic services. A study of Latina parents’ perspectives of barriers to autism diagnosis by Zuckerman et al. (2014) found that in addition to language barriers and inadequate access to care, Latina

parents also lacked empowerment to take advantage of services.

Peña, Stapleton and Schaffer (2016) encourage challenging the social construct of disability by collaborating with people with disabilities and their advocates for systemic change and justice. Identifying as a hard of hearing middle-class Korean adoptee, Pearson (2010) suggests that “disability can be used as an entry point to deconstruct or challenge normalcy” (p. 244) thereby challenging unidimensional disability services in post-secondary education, and special educational services that focus exclusively on a student’s diagnosed disability.

Conscious and Unconscious Bias

Preservice practitioners’ levels of multicultural competence can no longer rest on what feels most comfortable or how one personally identifies. “An intentional effort to deconstruct one’s [own] identit[ies] should be made first before attempting to understand the complexity of another person’s cultural background” (Howard-Hamilton, Cuyjet, & Cooper, 2011, p. 16). Preservice practitioners must all be committed to doing the hard work to look at these biases, especially around disability. Intersectional pedagogical practices help them interrogate how their perceptions of disability were socialized and how that socialization intentionally or unintentionally affects students and the ability to be creative when recognizing multiple layers of identity.

Social Privilege

People with social privileges are typically members of the dominant social groups in society, like gender (male/masculine), race (white), sexuality (heterosexual), or [dis]ability (neurotypical, able-bodied), among others (Morgan, 1996) and have not often or ever been the victim of prejudice or

oppression. Acknowledging this kind of systemic social power is challenging; “having never been the victim of racism and prejudice, [those with social privileges] can dismiss the importance of cultural differences . . . (Spring, 2000, p. 87).” These “intersectional blind spots” (Bazerman & Tenbrunsel, 2011; Chugh, Bazerman, & Banaji, 2005) are the systemic barriers Crenshaw (1991) suggested already placed multiple minoritized identities at higher risks for discrimination and ultimately prevent those who are privileged from a) recognizing when multiple minoritized identities experience prejudice, b) understanding the actions, feelings, and needs of multiple minoritized identities (Spring, 2000), and c) acknowledging their roles in creating or supporting inequality for multiple minoritized identities (National Association of School Psychologists [NASP], 2016). For example, when a white teacher misinterprets the actions of their black students (Spring, 2000) or their students with autism and initiates disciplinary action.

Multiple Minoritized Identities in Schools

The National Center for Education Statistics ([NCES] 2017) reported that almost 50% of U.S. public school students identified in multiple minoritized racial or ethnic groups, with 9.4% as English language learners (Proctor et al., 2017). 13% of students had disabilities and received special education services (NCES, 2017). During the 2015-2016 school year, approximately 17% of students with disabilities also identified as American Indian/Alaska Native, 16% were black, and 14% were white. Students with autism accounted for between five and nine percent of students with disabilities, with 21% also identifying as Asian, 10% of two or more races, and 10% as white (NCES, 2018).

The demographics of K-12 school practitioners however, tend to be white and

female, particularly those who serve students with increased social, emotional, or cognitive needs; for example, a recent study of school psychologists indicated 83% were female, 87% white, and 86% only spoke English (NASP, 2016; Walcott, Charvat, McNamara, & Hyson, 2016), and according to the U.S. Census Bureau (2016), 86.4% of special education teachers were female and 81.3% of special education teachers were white. Only 10.4% of special educators were Black or African American.

Intersectional concepts such as these are especially critical in academic environments because multiple minoritized identities in schools are on the rise while practitioners primarily identify as members of the dominant society. This runs the risk of dismissing important intersectional differences (Spring, 2000) because practitioners are unaware of their biases (Gay & Howard, 2000; Owen, 2010), not willing to engage (Darling-Hammond, 2002) or “define fairness and equity as treating all children the same; to some, being ‘colorblind’ [is] valuing diversity” (Owen, 2010, p. 18). When practitioners do not recognize these nuances or counteract them in their daily interactions, they are inadvertently contributing to further oppressive acts. For example, a practitioner can interpret the world through a cultural frame of reference that is female, middle class, and be influenced by personal religious beliefs, and while a student might share some of these perspectives like class or religion, s/he may identify more with other social identities and experiences that have been oppressed due to race and a diagnosis of autism.

Because practitioners are not equipped to understand the actions, feelings, and needs of their multiple minoritized students or systematic marginalization (Carroll, 2009;

Proctor & Meyers, 2015), they may not recognize the lasting consequences of their own privilege and bias (Brown, 2007) on students. If they are expected to understand or identify with identities that are different from their own, they must examine their own intersectional perspectives (Spring, 2000) prior to their work with students (Shriberg, 2016).

Preservice practitioner and education programs can comprehensively introduce (Zipp, 2012) and foster awareness around intersectional concepts and the impact on students with autism. In preservice education programs, this begins when the instructional faculty acknowledge intersectional identities - and therefore experiences - are different from their own (Proctor, Simpson, Levin, & Hackimer, 2014). Intersectional awareness can be structured to minimize bias, acknowledge systemic barriers, and counteract discriminatory practices that target multiple minoritized identities (NASP, 2016, p. 24) in schools.

Discussion

Intersectional pedagogy has the potential to genuinely promote social and cultural change only if practitioners are exposed prior to starting their work with students. However, promoting intersectional change in a sensitive way while allowing for a lot of practice is challenging. Intersectional pedagogy can be addressed in preservice practitioner programs by incorporating the following strategies.

Seek Intersectional Learning Opportunities

Like school practitioners, higher education faculty have the potential to powerfully impact their students with their own privilege or bias and therefore should seek experiences that offer opportunities for active self-identification and self-reflection. Examining

and understanding one's own cultural perspective will create the capacity to listen to, learn from, identify with, and embrace other cultural experiences. Prioritizing individual exploration alongside opportunities to learn alongside and from people who identify with different social identities offers opportunities to practice patience with peers (Hooven, Runkle, Strouse, Woods, & Frankenberg, 2018). Seek opportunities through university-sponsored professional development or pedagogical or diversity-centered organizations or conferences.

Be Aware

After faculty have explored their own practices and values, they are better able to build awareness into their pedagogy. At the core, be mindful of a variety of ways intersectionality can be infused in the collegiate environment. First, help preservice practitioners become aware of relevant civil rights legislation, like IDEA (2004). Intersectionality isn't just about disability discrimination though, so it is important to find opportunities to assess how faculty are promoting intersectional concepts in their classrooms, curriculum, or activities. For starters, recognize that most people become differently abled at some point in their lives (Kittay, 2011). Be aware of *microaggressions*, or brief exchanges that send denigrating messages to certain individuals because of their group membership (DeAngelis, 2009). Explicitly teaching about microaggressions will help preservice practitioners identify how these often unintentional exchanges occur (DeAngelis, 2009) in schools. Microaggressions are problematic to those in the autism community due to the subtle negative opinions or biases exhibited through exclusionary language such as "those kids" or exclusionary acts and programs in schools. It is also demonstrated through lowered

expectations from their neurotypical peers or worse, their service providers.

If preservice practitioners practice how to recognize their biases and microaggressions amid the intersections of multiple minoritized identities prior to their work with students, they will be better equipped to avoid making assumptions in their professional environments and will better advocate for their students and families.

Teach at the Intersections

Discussing social identities in relation to the education and health professions are equally as important. To begin, relate to and affirm all preservice practitioners by establishing class norms for discussions and offering ample opportunities for self-reflection. In addition, verbalize how to take care in consistently checking for subtle clues and nonverbal behavior among the students. Show flexibility when determining how much time to spend with sensitive topics, as students must have ample opportunities to explore a) how they have experienced judgment and bias, b) the ways biases have been exhibited against others, and c) the ‘why’ of their beliefs. Then build in activities that show how sometimes other’s beliefs are different and that beliefs are generally influenced by social privilege or a lack thereof (Bell, 2016). These kinds of opportunities help students reassess their own values, cultures and communities, and connect these concepts to their future professions.

Multidimensional aspects of human diversity should be present in instructional materials. Are the professor-provided resources positively representing multiple minoritized identities? Faculty can help students understand the relationship between power, privilege, and the layers of oppression by adapting content and materials to

appropriately represent these groups. Discussions should focus on how these populations have been historically erased or not well represented (Hooven et al., 2018) in all facets of education, including access, inclusion, curriculum, and overall opportunity. Individuals with autism are often portrayed through a disability-first perspective with the focus on scientific, clinical, or savant-like characteristics in popular media. For example, television shows that depict individuals with autism as geniuses; movies that emphasize a more heroic rhetoric where individuals with autism overcome the impossible; novels where family or community perspectives (medical model of disability) are emphasized; and picture books that lean more towards a clinical portrayal (Maich & Belcher, 2014). These rhetorics idealize or medicalize the challenges inherent to the diagnosis rather than promoting a multifaceted approach to human diversity.

Step Out of Your Comfort Zone

If the goal of teaching for social justice is to engage people in recognizing systems of oppression, one must get outside of their comfort zone. The collegiate experience can easily lend itself to opportunities for observation, learning, and reflecting on values, belief systems and experiences that are different from their own. The first step is for faculty to be aware of how their own background shaped their views, feelings and behavior toward others and to openly acknowledge and use this as a discussion point. What were their experiences working with students with autism? Did they ever have or act on misconceptions regarding this - or any other - population? How has their privilege helped (or not) them in their discipline?

Then, infuse these opportunities into students’ experiences, be it assigning

partners who have different individual backgrounds or embedding community-based or service learning opportunities that celebrate multiple minoritized communities in integrated neighborhoods. Other activities can be embedded directly into coursework. Privilege walks, hands-on diversity activities, or multimedia first-person experiences can provide intimate contact with or of people who differ racially, culturally, ethnically. Engage students in discussions of how differences in ability share similarities with other aspects of an individual's identity, which in turn relate to social privilege or marginalization.

Mitigate Biases

In order to mitigate biases, one must develop their capacity to shine a flashlight on themselves. Recognizing and accepting biases exist will naturally provide opportunities to practice '*constructive uncertainty*.' This can be awkward or difficult, but the first step is simple exposure to people whom are considered "others" (Jhangiani & Tarry, 2014). For example, exposure to positive role models with autism include Dr. Temple Grandin, Dan Ackroyd, and Daryl Hannah, among others. This kind of exposure naturally promotes self-reflective feedback, like "am I biased" or "am I missing something?"

Opportunities to engage with multiple minoritized identities can easily be found on a college campus. How is the faculty member connected with multicultural clubs or other extracurricular activities on campus? Organizations such as Best Buddies, Gay-Straight Alliance, or any ethnicity-based organization can provide opportunities for the faculty and college students to join groups as allies. When preservice practitioners serve as allies, they are preparing to support students with autism who wish to participate in organizations that represent and support

aspects of the student's intersectional identity. If formal involvement is not available, how are faculty facilitating these kinds of opportunities within their content, classroom, or discipline? How are they honoring first-person voices and representation in their classrooms?

Conclusion

Preparing preservice practitioners to consider autism, and disability in general, as one aspect of an individual's multidimensional identity requires a shift from the biomedical model perspective of a diagnosis. The socio-political model of disability focuses on barriers, attitudes and perceptions within the environment that can marginalize individuals who experience differences in abilities. Intersectionality provides a framework for considering disability from a social justice perspective, especially for individuals with multiple minoritized identities. Training preservice practitioners to recognize, acknowledge and embrace autism as a component of an individual's intersectional identity begins with providing the preservice practitioner with strategies to reframe their perspective of disability. Intersectionality provides the framework for shifting pedagogical practices toward a social justice, civil rights lens that recognizes disability as a minoritized component of an individual's identity. Only then are practitioners equipped to serve all populations and better advocate for their multidimensional students and families (Proctor et al., 2017).

Intersectional pedagogy

This manuscript discussed five main ways to incorporate intersectional pedagogy into the college classroom. 1. *Seek intersectional learning opportunities* by learning how to recognize and express privilege through professional learning communities. 2. *Be aware* and use privilege as an agent of social change; become aware of how multiple

minoritized identities are portrayed and treated in the college classroom. 3. *Teach to the intersections* by privileging the students' own identities, experiences, and stories and the stories of others'. 4. *Step out of your*

comfort zone by making connections with people who experience privilege differently, and 5. *Mitigate biases* by socializing and interacting with those of different social groupings.

References

- Asch, A. (2001). Disability, bioethics, and human rights. In G. L. Albrecht, K. D. Seelman, & M. Bury (Eds.), *Handbook of disability studies* (pp. 297–326). Thousand Oaks, CA: Sage.
- Association on Higher Education and Disability. (2012). *Supporting accommodation requests: Guidance on documentation practices*. Retrieved from https://www.ahead.org/uploads/docs/resources/Final_AHEAD_Supporting%20Accommodation%20Requests%20with%20Q&A%2009_12.pdf
- Autism Research Institute. (2019). Discrimination. Retrieved from https://www.autism.com/services_discrimination
- Autism Speaks. (2012). Mounting evidence of critical need for adult transition support. Retrieved from <http://www.autismspeaks.org/science/science-news/top-ten-lists/2012/mounting-evidence-critical-need-adult-transition-support>
- Baron-Cohen, S. (2004). *The essential difference: Male and female brains and the truth about autism*. New York: Basic Books.
- Bazerman, M. H. & Tenbrunsel, A. E. (2011). *BlindSpots: Why we fail to do what's right and | what to do about it*. Princeton, NJ: Princeton University Press.
- Bell, M. (2016). Teaching at the intersections: Honor and teach about your students' multiple identities. *Tolerance Magazine*, 53. Retrieved from <https://www.tolerance.org/magazine/summer-2016/teaching-at-the-intersections>
- Brown, M. (2007). Educating all students: Creating culturally responsive teachers, classrooms, and schools. *Intervention in School and Clinic*, 43(1), 57-62.
- Camarena, P. M., & Sarigiani, P. A. (2009). Postsecondary educational aspirations of high-functioning adolescents with autism spectrum disorders and their parents. *Focus on Autism and Other Developmental Disabilities*, 24, 115–128. doi:10.1177/1088357609332675
- Carroll, D. W. (2009). Toward multicultural competence: A practice model for implementation in the schools. In J. M. Jones (Ed.), *The psychology of multiculturalism in schools: A primer for practice, training, and research* (pp. 1–16). Bethesda, MD: National Association of School Psychologists.
- Census Bureau. (2016). *Data USA: Special education teachers*. Retrieved from <https://datausa.io/profile/soc/252050/>
- Centers for Disease Control and Prevention. (2018). Spotlight on racial and ethnic difference in children identified with autism spectrum disorder. Retrieved from <https://www.cdc.gov/ncbddd/autism/addm-community-report/differences-in-children.html>
- Chiang, H. M., Cheung, Y. K., Hickson, L., Xiang, R., & Tsai, L. Y. (2012). Predictive factors of participation in postsecondary education for high school leavers with autism. *Journal of Autism and Developmental Disorders*, 42, 685–696. doi:10.1007/s10803-011-1297-7

- Christensen, D. L., Braun, K., Baio, J., Bilder, D., Charles, J., Constantino, J. N., ... Yeargin-Allsopp, M. (2018). Prevalence and Characteristics of Autism Spectrum Disorder Among Children Aged 8 Years - Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2012. *Morbidity and mortality weekly report. Surveillance summaries (Washington, D.C.: 2002)*, 65(13), 1–23. doi:10.15585/mmwr.ss6513a1
- Chugh, D., Bazerman, M. H., Banaji, & M. R. (2005). Bounded ethically as a psychological barrier to recognizing conflicts of interest. In D. Moore, D. Cain, G. Loewenstein, & M. Bazerman, (Eds.), *Conflict of interest: Challenges and solutions in business, law, medicine, and public policy*. Cambridge, UK: Cambridge University Press.
- Cooper, B. (2015). Intersectionality. In L. Disch & M. Hawkesworth (Eds.), *The Oxford handbook of feminist theory*. Retrieved from <http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199328581.001.0001/oxfordhb-9780199328581-e-20>
- Cory, R. C. (2011). Disability services offices for students with disabilities: A campus resource. *New Directions for Higher Education*, 154, 27–36.
- Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review*, 43(6), 1241–1299.
- Crenshaw, K. (2015, September 24). Why intersectionality can't wait. *Washington Post*. Retrieved from <http://www.washingtonpost.com/news/in-theory/wp/2015/09/24/why-intersectionality-cant-wait/>
- Damiani, M., & Harbour, W. (2015). Being the wizard behind the curtain: Teaching experiences of graduate teaching assistants with disabilities at U.S. universities. *Innovative Higher Education*, 40, 399–413. <https://doi.org/10.1007/s10755-015-9326-7>
- Darling-Hammond, L. (2002). Educating a profession for equitable practice. In L. Darling-Hammond, J. French, & S. P. Garcia-Lopez (Eds.), *Learning to teach for social justice* (201–212). New York, NY: Teachers College Press.
- DeAngelis, T. (2009). UnMasking 'racial micro aggressions.' *American Psychological Association*. 40, 42.
- Devlieger, P., Rusch, F., & Pfeiffer, D. (2003). Rethinking disability as same and different! Towards a cultural model of disability. In P. Devlieger, F. Rusch & D. Pfeiffer (Eds.), *Rethinking disability: The emergence of new definitions, concepts and communities* (pp. 9–16). Philadelphia, PA: Garant/Coronet Books.
- Dill, B. T., & Zambrana, R. E. (2009). Critical thinking about inequality: An emerging lens. In B. T. Dill & R. E. Zambrana (Eds.), *Emerging intersections: Race, class and gender in theory, policy and practice* (pp. 1–21). New Brunswick, NJ: Rutgers University Press.
- Gay, G., & Howard, T. C. (2000). Multicultural teacher education for the 21st century. *The Teacher Educator*, 36(1), 1–16. <http://dx.doi.org/10.1080/08878730009555246>
- Howard-Hamilton, M. F., Cuyjet, M. J., & Cooper, D. (2011). Understanding multiculturalism and multicultural competence among college students. In M. J. Cuyjet, M. F. Howard-Hamilton, & D. L. Cooper (Eds.), *Multiculturalism on campus: Theory, models, and practices for understanding diversity and creating inclusion* (pp. 2–18). Sterling, VA: Stylus.
- Hooven, J., Runkle, K., Strouse, L., Woods, M. & Frankenberg, E. (2018). Never too early to learn: Antibias education for young children. *Education Policy Studies* 99(5), 61-66.
- Hutcheon, E. J., & Wolbring, G. (2012). Voices of “disabled” postsecondary students: Examining higher education “disability” policy using an ableism lens. *Journal of Diversity in Higher Education*, 5(1), 39.

- Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004).
- Jhangiani, R., & Tarry, H. (2014). The social self: The role of the social situation. In C. Stangor, *Principles of Social Psychology*. Washington, DC: Flat World Education Inc.
- Kreiser, N., & White, S. (2014). ASD in females: Are we overstating the gender difference in diagnosis? *Clinical Child & Family Psychology Review*, 17(1), 67–84.
<https://doi.org/10.1007/s10567-013-0148-9>
- Kittay, E. F. (2011). The ethics of care, dependence, and disability. *Ratio Juris*, 24(1).
- Linton, S. (1998). *Claiming disability: Knowledge and identity*. New York, NY: New York University Press.
- Maich, K., & Belcher, C. (2014) Autism Spectrum Disorder in popular media: Storied reflections of societal views. *Brock Education*, 23, 97-115.
- McRuer, R. (2006). *Crip theory: Cultural signs of queerness and disability*. New York, NY: New York University Press
- Mitchell, T. D. (2008). Traditional vs. critical service-learning: Engaging the literature to differentiate two models. *Michigan Journal of Community Service Learning*, 14, 50–65.
- Mitchell, T. D. (2017). Teaching community on and off Campus: An intersectional approach to community engagement. *New Directions for Student Services*, 2017, 35–44.
<https://doi.org/10.1002/ss.20207>
- Morgan, K. P. (1996). Describing the emperor’s new clothes: Three myths of educational in(equality). In A. Diller, B. Houston, K. P. Morgan, & M Ayim, M. (Ed.), *The gender question in education, theory, pedagogy, & politics* (pp. 105-122). Boulder, CO: Westview.
- Museus, S. D., & Griffin, K. A. (2011). Mapping the margins in higher education: On the promise of intersectionality frameworks in research and discourse. *New Directions for Institutional Research*, 151, 5–13. doi:10.1002/ir.395
- National Association of School Psychologists. (2016). *Understanding intersectionality*. [handout]. Bethesda, MD: Author.
- National Center for Educational Statistics. (2017). *Condition of education 2017*. Washington, DC: Author.
- National Center for Educational Statistics. (2018). *Children and Youth with Disabilities*. Retrieved from https://nces.ed.gov/programs/coe/indicator_cgg.asp
- Ong-Dean, C. (2005). Reconsidering the social location of the medical model: An examination of disability in parenting literature. *Journal of Medical Humanities*, 26, 141–158.
<https://doi.org/10.1007/s10912-005-2915-1>
- Owen, P. M. (2010). Increasing preservice teachers’ support of multicultural education. *Multicultural Perspectives*, 12(1), 18–25. <http://dx.doi.org/10.1080/15210961003641310>
- Pearson, H. (2010). Complicating intersectionality through the identities of a hard of hearing Korean adoptee: An autoethnography. *Equity and Excellence in Education*, 43, 341–356.
- Peña, E. V., Stapleton, L. D., & Schaffer, L. M. (2016). Critical perspectives on disability identity. *New Directions for Student Services*, 154, 85–96. Doi: 10.1002/ss.20177
- Proctor, S. L., Kyle, J., Fefer, K., & Lau, C. (2017). Examining racial microaggressions, race/ethnicity, gender, and bilingual status with school psychology students: The role of intersectionality. *Contemporary School Psychology*. Advance online publication. doi:10.1007/s40688-017-0156-8

- Proctor, S. L., & Meyers, J. (2015). Best practices in primary prevention in diverse schools and communities. In P. L. Harrison & A. Thomas (Eds.), *Best practices in school psychology: Foundations*. (pp. 33–47). Bethesda, MD: National Association of School Psychologists.
- Proctor, S. L., Simpson, C. M., Levin, J., & Hackimer, L. (2014). Recruitment of diverse students in school psychology programs: Direction for future research and practice. *Contemporary School Psychology, 18*, 117–126. doi:10.1007/s40688-014-0012-z
- Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). *Postsecondary education and employment among youth with an autism spectrum disorder. Pediatrics, 129*, 1042–1049. doi:10.1542/peds.2011-2864
- Shriberg, D. (2016). School psychologists as advocates for racial and social justice: Some proposed steps. Commentary: *School Psychology Forum, 10*, 337–339.
- Siebers, T. (2008). *Disability theory*. Ann Arbor, MI: The University of Michigan Press.
- Smith, L., Foley, P. F., & Chaney, M. P. (2008). Addressing classism, ableism, and heterosexism in counselor education. *Journal of Counseling & Development, 86*, 303–309.
- Sommo, A., & Chaskes, J. (2013). Intersectionality and the disability: Some conceptual and methodological challenges. *Research in Social Science and Disability, 7*, 47–59.
- Spring, Joel (2000). *The intersection of cultures: Multicultural education in the United States and the global economy*. New York City, New York: McGraw Hill Higher Education.
- Vance, M. L. (Ed.). (2007). *Disabled faculty and staff in a disabling society: Multiple identities in higher education*. Huntersville, NC: The Association on Higher Education and Disability.
- Walcott, C. M., Charvat, J., McNamara, K. M., & Hyson, D. M. (2016, February). *School psychology at a glance: 2015 member survey results*. Special session presented at the annual meeting of the National Association of School Psychologists, New Orleans, LA.
- Weber, L. (2010). *Understanding race, class, gender, and sexuality: A conceptual framework*. New York, NY: Oxford University Press.
- Wijeyesinghe, C. L., & Jones, S. R. (2014). Intersectionality, identity, and systems of power and inequality. In D. Mitchell, C. Y. Simmons, & L. A. Greyerbiehl (Eds.), *Intersectionality and higher education: Theory, research, and praxis* (pp. 9–19). New York, NY: Peter Lang.
- World Health Organization. (2011). *World report on disability*. Geneva, Switzerland: World Health Organization. Retrieved from http://whqlibdoc.who.int/publications/2011/9789240685215_eng.pdf?ua=1
- Zipp, J. F. (2012). Teaching for Whom? *Teaching Sociology, 40*, 301-311.
- Zuckerman, K. E., Sinche, B., Mejia, A., Cobian, M., Becker, T., & Nicolaidis, C. (2014). Latino parents' perspectives on barriers to autism diagnosis. *Academic pediatrics, 14*, 301–308. doi:10.1016/j.acap.2013.12.004

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Effectiveness and Implications of Mindfulness-Based Interventions for Mental Health Outcomes in Individuals with Autism Spectrum Disorder: A Systematic Literature Review

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Abstract: Several studies support that the practice of mindfulness can promote positive mental health outcomes for individuals with autism spectrum disorder. This systematic literature review explored the effectiveness of mindfulness-based interventions on mental health outcomes for individuals with autism spectrum disorder. A total of 12 articles were identified and mindfulness elements and study findings are discussed. Moving forward, rigorous methodologies are needed to better understand how mindfulness can help improve the mental health in those with autism spectrum disorder.

The prevalence of individuals with autism spectrum disorder (ASD) among the general population is 1 in 150, varies by race and ethnicity, and is higher among males rather than females, according to the American Psychiatric Association [APA](2013). ASD is a neurologically-based disorder that affect individuals primarily in their communication and social interactions with other people (APA, 2013). Diagnostic criteria for ASD include a comprehensive diagnostic evaluation and a developmental screening (e.g., basic speaking skills) of the individual and early intervention is key in lessening the severity of the disorder (Lord et al., 2006). Causes of ASD are believed to be developmental brain abnormalities that may be genetically influenced, yet further research is needed to determine these causal relationships (Westling & Fox, 2009). Predominant characteristics of youth with ASD are impaired social interaction and communication (e.g., not making eye contact), repetitive behavior (e.g., engaging in self-injurious behavior), and limited

imagination or play behavior (Westling & Fox, 2009). Individuals with ASD typically test low in areas of information processing, acquired knowledge, and verbally mediated skills, yet can test higher in skills that require less verbal ability (e.g., organization; Westling & Fox, 2009). However, it is important to note the severity of these behaviors and skills vary across individuals.

One health concern that individuals with ASD can have is an increased risk for developing mental health disorders (APA, 2013). Specific examples of these mental health disorders include anxiety, depression, conduct (e.g., aggressive behavior), externalizing, internalizing, and others as listed by the *Diagnostic and Statistical Manual of Mental Disorder* (APA, 2013). Simonoff and colleagues (2008) conducted a population-derived cohort ($N=255$) to assess mental health disorders in adolescents with ASD (aged 10-14 years old) via the Child and Adolescent Psychiatric Assessment (Baker & Skuse, 2005). Various types of mental health

disorders including childhood anxiety disorder, depressive disorders, emotional disorder, and attention-deficit/hyperactivity disorder (ADHD) were identified (APA, 2013). Results from the sample show 41.9% with an anxiety disorder, 30% with a depressive disorder, 44.4% with an emotional disorder, and 28.2% with ADHD. Additionally, the study reports 71% of adolescents sampled had at least one mental health disorder mentioned above. The majority of adolescents with at least one mental health disorder had multiple disorders (41% of the 71%) and one third of these (24% of 71%) had three or more disorders in addition to the ASD (Simonoff et al., 2008). These results are similar for adults with ASD and mental health disorders. One study investigated the prevalence of mental health disorders in adults with ASD ($N=122$, M age=29) and found that 50% had an anxiety disorder and 53% had a depressive disorder (Hofvander et al., 2009). These studies suggest that individuals with ASD are at a heightened risk for developing mental health disorders.

Current strategies used to help support mental health in individuals with ASD include psychopharmacological approaches. However, there is insufficient evidence concerning these approaches and they may have unintended consequences, such as drowsiness (Unwin & Deb, 2011). Other strategies focus on behavioral approaches and more recently cognitive-behavioral approaches that highlight positive behaviors (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). These interventions, such as Acceptance and Commitment Therapy (Hayes et al., 2006) and Dialectical Behavior Therapy (Robins & Rosenthal, 2011) include developing positive coping skills to promote mental health. These interventions use mindfulness, which have led researchers to further investigate the construct of

mindfulness in supporting mental health in individuals with ASD. Results of several studies demonstrate that mindfulness can positively benefit certain mental health disorders in individuals with ASD (e.g., Singh et al., 2011a). In addition, Cachia, Anderson, and Moore (2015) conducted a review and found six studies that highlight the importance of using mindfulness as a means to help improve mental health disorders for those with ASD.

Mindfulness is the ability to non-judgmentally observe emotions, sensations, or cognitions in moment-to-moment awareness (Kabat-Zinn, 1990) and can enhance self-regulatory skills (Kabat-Zinn, 1994; 2003). Studies show the ability to self-regulate is a critical component of mental health (Baumeister & Vohs, 2003; Kabat-Zinn, 2003; Vohs & Baumeister, 2011). Specific mechanisms, such as attention and emotion regulation, explain the relationship between mindfulness and self-regulation (Holzel et al., 2011). As a result, mindfulness-based interventions (MBIs) have increasingly been used in clinical and non-clinical populations due to several mental health benefits that can occur from the practice (Bishop et al., 2004). One example of an MBI is mindfulness-based cognitive therapy (MBCT), which combines elements of cognitive-behavior therapy with mindfulness practice to enhance self-regulatory skills (Teasdale et al., 2008). Another MBI is mindfulness-based stress reduction (MBSR) that can be used for a variety of health reasons including anxiety and stress (Brantley, 2005). However, these types of MBIs can be adapted and modified to include different forms of mindful practice (e.g., body awareness) and to fit the needs of the individual.

Based on the ASD and mindfulness research literature presented, it appears that MBIs can

help promote positive mental health outcomes for individuals with ASD. The primary purpose of this systematic literature review was to examine the effectiveness of MBIs targeting mental health outcomes in those with ASD. Study results and the outcome measures utilized in the study, were assessed. Another aim was to analyze components of the MBIs and the theories related to self-regulation. One last aim was to consider implications for research and practitioners. Understanding how mindfulness can support the mental health needs for individuals with ASD can help researchers design more effective MBIs for this population.

Method

Inclusion Criteria

The article needed to be published in English to be included. A primary diagnosis of ASD, Asperger syndrome (AS), or pervasive developmental disorder (PDD; APA, 2013) and an appropriate definition of mindfulness (Kabat-Zinn, 1994) had to be provided concerning the individuals and study. MBIs that used mindfulness as the chief component in the study, which can include MBCT and MBSR, were included. Studies involving a caregiver or parent were included (i.e., parent-child dyad), as long as the intervention was given to both the caregiver/parent and individual with ASD. These included teaching the caregiver and/or parent the intervention, who then taught the MBI to the individual with ASD. Studies that involve yoga in conjunction with mindfulness were included, due to mindful movement through yoga being an important piece of MBIs.

Exclusion Criteria

Since Acceptance and Commitment Therapy and Dialectical Behavior Therapy do not use mindfulness as a key component in the intervention, these types of studies were

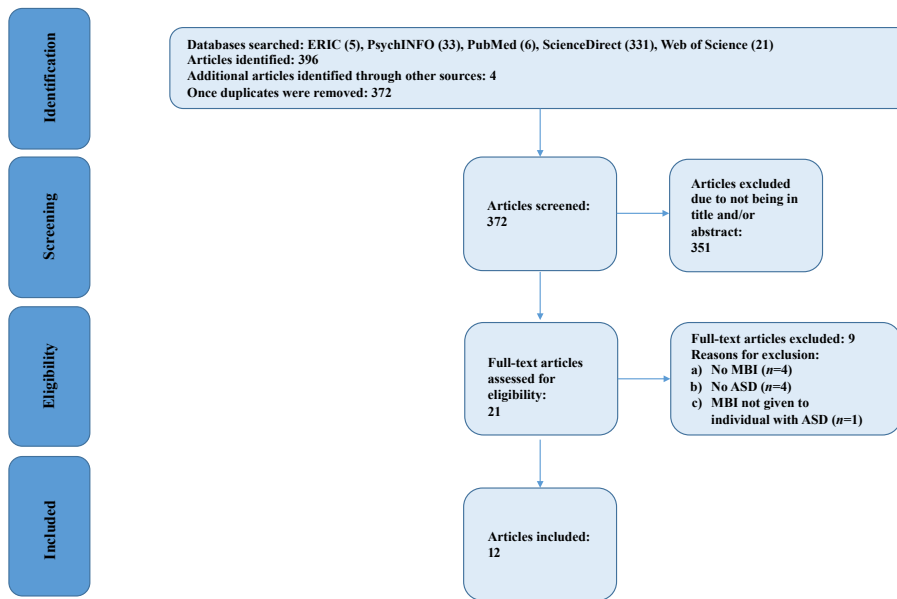
excluded. Studies investigating mindfulness as a descriptive trait or which did not have mental health outcomes as the dependent variable were excluded. There were no limitations concerning the study design, publication year, and if the study was published or not to be included.

Search Strategy

A systematic search was conducted in spring of 2019 on the following databases: ERIC, PsychINFO, Pubmed, Web of Science, and ScienceDirect. Key search terms were mindfulness-based intervention (MBI) and ASD. Meditation and AS are often used instead of MBI or ASD, which is the reason these search terms were used as well. References in quantitative studies, literature reviews, and meta-analyses from the database searches were examined to determine whether they contained mention of any studies that were not encountered in the database searches.

Figure 1 displays a flow diagram of how studies were selected. A total of 396 studies were identified through database searching, with an additional four studies identified through other sources (i.e., reference lists). Screening for duplicates was completed by the primary researcher, leaving a total of 372 studies to be screened. Next, studies were excluded if they did not have the key search terms (e.g., ASD) in the title and/or abstract. The studies that did have the search terms were examined to be considered, leaving a total of 12 studies to be included in the review. The author(s), participants, study design, mindfulness components, implementation length, targeted mental health outcomes, outcome measures, data analysis, and findings were obtained. These components and others were assessed to determine and discuss any patterns or themes seen across the included articles.

Figure 1. *Flow diagram of selected articles. This figure illustrates identified and selected articles and was adapted from Moher et al., 2015.*



Results

Overview of the Articles

Table 1 summarizes the key characteristics of the articles that were included in the present review. The reviewed studies included children ($n=1$), adolescents ($n=8$), and adults ($n=3$) with ASD. Six studies included parent-child dyad and/or parent-adolescent dyad. Only one study utilized a randomized control trial and five studies implemented a pre- and post-study design. The remaining studies used a multiple baseline design ($n=4$).

Effectiveness on Mental Health Outcomes

The majority of studies report improvement in mental health outcomes investigated. However, the mental health outcomes examined varied across the studies. A total of five studies (Hwang et al., 2015; Singh et al., 2006; Singh et al., 2011a; Singh et al., 2011b; Singh et al., 2014) specifically investigated the effects of MBIs on physical aggression and other behavioral issues (e.g., self-injury) in children and adolescents with ASD.

Effectiveness of the MBI on physical aggression was based on the frequency of the behavioral incidents seen, except for the Hwang et al. (2015) study that employed a Paired Sample Wilcoxon Signed Rank test to determine efficacy. All five studies report improvement in physical aggression and other behavioral issues for the participants following the completion of the MBI.

Furthermore, de Bruin and colleagues (2014), Kiep et al. (2014), and Spek et al. (2013) investigated anxiety, depression, and rumination (i.e., worry) as their dependent variables. For de Bruin et al. (2014), the authors report significant improvement in rumination in adolescents with ASD, but not for anxiety or depression. Both Kiep et al. (2014) and Spek et al. (2013) report significant improvement in all three mental health outcomes; however, these studies tested the effects of an MBI on adults with ASD. Only one study examined attention and impulsivity mental health outcomes in

Table 1 Characteristics of Included Studies and MBIs for Individuals with ASD								
Author(s)	Participants	Study Design	Mindfulness Components	Implementation Length	Mental Health Outcome(s)	Outcome Measure(s)	Data Analysis	Findings
Singh et al., (2006)	Parent-child dyad; three children with ASD aged 4-6; three parents aged 24-33	Multiple-baseline design	Mindful Parenting (Kabat-Zinn & Kabat-Zinn, 1997)	12 weeks of training with 3 sessions per week (length not specified)	Conduct disorder (i.e., aggression, noncompliance, and self-injury)	Subjective Units of Parenting Satisfaction, Subjective Units of Interaction Satisfaction, Subjective Units of Use of Mindfulness	Mean number of behavior incidents. Mean number of self-ratings	<i>For children:</i> decreased incidents of aggression, noncompliance, and self-injury <i>For parents:</i> increased mother's satisfaction with their parenting skills and interactions with their children; improvement was still seen at 80 weeks
Bögels, Hoogstad, van Dun, Schutter, & Restifo (2008)	Parent-adolescent dyad; adolescents with ASD, AP, or PDD ($n=14$, M age=14.4), 2 adolescents participated alone; parents ($n=12$)	Pre- and post-design with follow-up	MBCT (Segal, Williams, & Teasdale, 2002)	8 trainings for 1.5 hrs.	Attention and impulsivity	Goal Attainment Scale, Child Behavior Checklist, Children's Behavior Questionnaire, Self-Control Rating Scale, D2 Test of Attention, Subjective Happiness Scale, Pediatric Quality of Life Inventory, MAAS	Paired t -tests	Significantly improved attention and impulsivity and improvement was maintained 8 weeks after training for both adolescents and parents
Singh et al., (2011a)	Adolescents with AS ($N=3$) aged 14, 16, and 17	Multiple-baseline design, with follow-up	Soles of the Feet (SOF) (Singh et al., 2003)	<i>First:</i> Mother trained to do SOF <i>Second:</i> Mother teaches son to use SOF for 30-minutes, 5 days per week	Conduct disorder (i.e., physical aggression)	Incidents of physical aggression, such as hitting, biting, and kicking	Mean number of physical aggression incidents	Decreased incidents of physical aggression during training and at follow-up

Singh et al., (2011b)	Adolescents with AS ($N=3$, Age Range=13-18)	Multiple-baseline design, with follow-up	SOF (Singh et al., 2003)	<i>First:</i> Mother trained to do SOF <i>Second:</i> Mother teaches son to use SOF for 15-minutes, for 5 days and then encouraged to practice twice a day with the mother	Conduct disorder (i.e., physical aggression)	Incidents of physical aggression, such as hitting, biting, and kicking	Mean number of physical aggression incidents	Decreased incidents of physical aggression during training and at follow-up
Spek, van Ham, Nyklicek (2013)	Adults with ASD, AS, or PDD with an age range of 18-65; Mindfulness group ($n=20$); Control group ($n=21$)	RCT	MBCT (Segal, Williams, & Teasdale, 2002)	Nine weekly sessions of 2.5 hours each. Participants practiced 40-60 minutes of meditation daily, six days per week	Anxiety, depression, and rumination disorders	The Symptom Checklist-90-Revised, Rumination-Reflection Questionnaire, Dutch Global Mood Scale	Independent samples t -test, Chi-square tests, MANOVA	Significant reduction in anxiety, depression, and rumination in the mindfulness group, Positive affect increased in mindfulness group, compared to control group
de Bruin et al., (2014)	Parent-adolescent dyad; 23 adolescents with ASD, AS, or PDD aged 11-23; 18 mothers age range 40-59, 11 fathers age range 48-61	Pre- and post-design, with follow-up	<i>MyMind</i> Mindfulness Training, based on MBCT and MBSR training for adolescents; mindful parenting program for parents	Nine weekly sessions 1.5 hours for both adolescents and parents; one joint session following intervention	Anxiety, depression, and rumination disorders	<i>For adolescents:</i> Autism Questionnaire, Penn State Worry, Ruminative Response Scale, World Health Organization-Five Well-Being Index <i>For parents:</i> Five Facet Mindfulness, Parenting Stress-Index-Competence Scale, World Health Questionnaire-Five Well-Being Index,	Paired t -tests	<i>For adolescents:</i> Increased quality of life and decreased rumination, Improved social responsiveness, social communication, social cognition, preoccupations, and social motivation <i>For parents:</i> Improved parenting styles and parental mindfulness

						Interpersonal Mindfulness in Parenting Scale		
Kiep, Spek, & Hoeben (2014)	50 adults with ASD aged 25 to 60	Pre- and post-design	MBCT (Segal, Williams, & Teasdale, 2002)	Nine weekly sessions, 2.5 hours each, participants were instructed to do home mediation practice for 40-60 minutes, six times per week	Anxiety, depression, and rumination disorders	Symptom Checklist-Revised 90, Ruminative Reflection Questionnaire, Dutch Global Mood Scale	Repeated measures MANOVA and MANCOVA	Decreased anxiety, depression, and rumination symptoms, increased positive affect
Singh et al., (2014)	Parent-adolescent dyad; three adolescents with ASD aged 15-19; three parents aged 37-43	Multiple-baseline design	Mindfulness-based positive behavior support training (MBPBS) and SOF (Singh et al., 2003)	MBPBS was introduced and consisted of 1-day trainings for 8 weeks, then mindfulness practice was implemented until week 48	Aggression, (e.g., hitting and kicking), disruptive behavior (i.e., negatively affected family social interactions), and compliance with mother's response	The incidents of aggression, disruptive behavior, and compliance with mother's response at home and in the presence of the mother	Mean frequency of incidents at baseline, MBPBS training phase, and MBPBS practice phase, Visual analysis and Interpretative Phenomenological Analysis	<i>For adolescents:</i> reduced incidents of aggression, disruptive behavior, and compliance with mother's response seen during the MBPBS practice phase <i>For parents:</i> Decreased parental stress
Hwang et al., (2015)	Six parent-adolescent dyads; six adolescents with ASD, AS, or PDD aged 8-15; six parents aged 34-48;	Pre- and post-design	Mindfulness program created by the primary researcher that has elements of MBSR	<i>First:</i> Parents completed an 8-wk. mindfulness training, with 2.5 weekly hour session and a 2-month self-practice period <i>Second:</i> Parents delivered the intervention to the	Parenting stress and problem behaviors in adolescents including anxiety, aggressive behavior, and attention	<i>For adolescents:</i> Child Behavior Checklist <i>For parents:</i> Freiburg Mindfulness Inventory, Parenting Stress Scale, Beach Family Quality of Life	Paired Sample Wilcoxon Signed Rank test	<i>For adolescents:</i> Reduction in physical aggression and other behavioral issues <i>For parents:</i> Reduction in parental stress

				adolescents for 12 months				
Connor & White (2017)	Nine male adults with ASD, between the ages of 18 and 25	Pre- and post-design	Mindfulness and acceptance based protocol	Six, 1-hour long sessions, with 20 minutes of daily meditation practices	Impaired emotion regulation	Difficulties in Emotion Regulation Scale, Outcome Questionnaires	Reliable Change Indices	Of the nine participants, seven demonstrated improvement in emotion regulation
Ridderinkhof et al., (2017)	Parent-adolescent dyads; 45 adolescents with ASD, AS, or PDD aged 8-19; 43 mothers and 31 fathers	Pre- and post-design	<i>MyMind</i> Mindfulness Training, based on MBCT and MBSR training	Nine weekly group sessions for adolescents and parents, separately, lasting 1.5 hrs.	Emotional and behavioral functioning (i.e., internalizing and externalizing issues) for both adolescents and parents	<p><i>For adolescents:</i> Children's Acceptance and Mindfulness Measure, Chronic Stress Questionnaire for Children and Adolescents, Chronic Sleep Reduction, Youth Self Report, Social Responsiveness Scale-Dutch version, Achenbach System of Empirically Based Assessment, Child Behavior Checklist, Ruminative Rating Scale,</p> <p><i>For parents:</i> Social Responsiveness Scale-Adults, Adult Self Report, Perceived Stress Scale, Parenting Stress Index, Interpersonal Mindfulness in Parenting Scale for parents</p>	Multilevel analysis	Improved emotional and behavioral functioning for adolescents and parents

Ridderinkhof et al., (2018)	49 adolescents with ASD (ages 8-23) and 51 age, gender, and education matched adolescents without ASD	Pre- and post-test comparison on design, with follow-up	<i>MyMind</i> Mindfulness Training, based on MBCT and MBSR training	<p>The adolescents with ASD were first on a waitlist for 5-9 weeks, given the pre-test, 9 weeks of <i>MYmind</i> training, given the post test, self-practice for 9 weeks, a booster session 2 months after the post-test, and after 10 months at follow-up.</p> <p>The adolescents without ASD took the pre-test, had a 4-5 week waiting period then took the post test.</p>	Attention (i.e., alerting, orienting, executive function)	ANT-child version (Rueda et al., 2004)	Multilevel analysis	Improved executive attention and orienting attention for the adolescents with ASD
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Note. This table displays characteristics of the identified studies.

adolescents with ASD and demonstrates significant improvement for both dependent variables (Bögels et al., 2008). Another study investigated the effects of an MBI on attention and found improvement in executive attention and attention orienting (Ridderinkhof, de Bruin, van den Driesschen, & Bögels, 2018). Ridderinkhof and colleagues (2017) was the only study to explore the effects of an MBI on emotional and behavioral functioning (i.e., internalizing and externalizing problems) in adolescents with ASD, which significantly improved after completing the MBI. Finally, Connor and White (2017) investigated emotion regulation in adults with ASD who participated in an MBI. However, only seven of the nine participants demonstrated improvement in emotion regulation.

Effectiveness of MBIs on parental outcomes. Results concerning parental outcomes from the six studies investigating the effects of an MBI on parent-child and/or parent-adolescent dyads were promising. Only one study focused on a parent-child dyad and results demonstrated the MBI increased the parent's satisfaction with their parenting skills and interactions with their children (Singh et al., 2006). Bögels et al. (2008) parent-adolescent dyad reported parents significantly improved on their attention and impulsivity, along with overall personal goals. Another parent-adolescent dyad shows a significant improvement in competence in parenting, overall parenting styles, verbose parenting style, and an increased quality of life for the parents (de Bruin et al., 2014). Reduced parental stress was seen in Singh and colleagues (2014) parent-adolescent dyad, along with improved interactions and relationships with their adolescents. Similarly, Hwang et al. (2015) demonstrated reduced parental stress following the completion of the parent-adolescent dyad MBI. Lastly, parents

reported improved emotional and behavioral functioning, improved parenting, and increased mindful awareness (Ridderinkhof et al., 2017).

Outcome Measures

The majority of studies using outcome measures to determine effectiveness on mental health outcomes upon completing the MBI report reliability and validity. For instance, Spek and colleagues (2013) used three self-report questionnaires (i.e., the Symptom Checklist-90-Revised, Rumination-Reflection, and Dutch Global Mood Scale) for adults with ASD and report high reliability and validity. In addition, the researchers who administered the surveys were familiar working with individuals with ASD. The Symptom Checklist-90-Revised, Rumination-Reflection, and Dutch Global Mood Scale Questionnaires were additionally used in Kiep et al. (2014) for adults with ASD. Furthermore, Connor and White (2017) administered the Difficulties in Emotion Regulation Scale and Outcome Questionnaire for adults with ASD and both report high reliability and validity scores.

For the parent-child dyad and/or parent-adolescent dyad studies, outcome measures varied across the studies. Bögels and colleagues (2008) utilized the Goal Attainment Scale, Child Behavior Checklist, Children's Behavior Questionnaire, Self Control Rating Scale, D2 Test of Attention, Subjective Happiness Scale, Pediatric Quality of Life Inventory, and the Mindful Attention and Awareness Scale (MAAS). All measures report high validity and reliability scores and both the adolescents and parents completed the questionnaires. de Bruin et al. (2014) used self-report questionnaires with high valid and reliable scoring as well, including the Autism Questionnaire, Penn State Worry, Ruminative Response Scale, World Health Organization-Five Well-Being

Index, and the MAAS-Adolescent version for adolescents with ASD. For the parents, the Five Facet Mindfulness, Parenting Stress-Index-Competence Scale, World Health Questionnaire-Five Well-Being Index, and the Interpersonal Mindfulness in Parenting Scale were administered, and the self-report questionnaires have high reliability and validity. Moreover, Hwang et al. (2015) used the Freiburg Mindfulness Inventory, Parenting Stress Scale, and the Beach Family Quality of Life self-questionnaires for parents, but only report high reliability for the measures. For the adolescents, the Child Behavior Checklist self-report questionnaire was given, which was used in Bögels et al. (2008) as well. Lastly, parents completed the Social Responsiveness Scale-Dutch version, Achenbach System of Empirically Based Assessment, Child Behavior Checklist, and Ruminative Rating Scale for their adolescents with ASD and completed the Social Responsiveness Scale-Adult, Adult Self Report, Perceived Stress Scale, Parenting Stress Index, and Interpersonal Mindfulness in Parenting Scale for themselves. For adolescents, the Children's Acceptance and Mindfulness Measure, Chronic Stress Questionnaire for Children and Adolescents, Chronic Sleep Reduction Questionnaire, and Youth Self Report report high reliable and valid scores (Ridderinkhof et al., 2017).

Mindfulness Components

All MBIs were modified or tailored for individuals with ASD. Although the majority of studies followed different types of mindfulness protocols and training durations, some curriculums were seen in multiple studies. For example, MBCT was the mindfulness protocol used in three total studies (Bögels et al., 2008; Kiep et al., 2014; Spek et al., 2013), specifically the curriculum developed by Segal, Teasdale, and Williams (2004). This mindfulness protocol was

developed to treat depression and was adapted for the age and specific difficulties of the participants with ASD (Segal et al., 2004). Some general aspects of the mindfulness training include body scan practice and mindfulness of the breath, which consists of eight, 1.5-weekly sessions (Segal et al., 2004).

Another two studies followed the Soles of the Feet mindfulness training to improve the mental health outcomes in individuals with ASD (Singh et al., 2011a; Singh et al., 2011b). The Soles of the Feet was specifically designed for individuals with intellectual and developmental disabilities (IDD), which can include those with ASD (APA, 2013). The Soles of the Feet comprises of redirecting one's attention from an aggression-triggering event to a neutral place on their body, the soles of the feet (Singh et al., 2003). The training for Soles of the Feet expands over the course of five days, with 30-minute sessions (Singh et al., 2003). Three other studies completed the *MYmind* mindfulness-based protocol, a curriculum that was originally designed for those with attention-deficit hyperactivity disorder (de Bruin et al., 2014; Ridderinkhof et al., 2017; Ridderinkhof et al., 2018). This program was adapted for individuals with ASD and focuses on bodily awareness and self-control through mindfulness, which is delivered over nine, 1.5-hour weekly sessions (Van der Oord, Bögels, S. M., & Peijnenburg, 2012). Adaptations included focusing on dealing with changes and feelings in relation to having ASD (de Bruin et al., 2014).

Only one study implemented Mindful Parenting (Kabat-Zinn & Kabat-Zinn, 1997), a protocol focused on meditation methods to enhance the parent's mindfulness and practice mindfulness during interactions with their children, consisting of four weekly training sessions (Singh et al., 2006). In

addition, Singh et al. (2014) employed the Mindfulness-Based Positive Behavior Support (MBPBS) protocol, which consists of instruction on the four immeasurables (i.e., loving-kindness, compassion, joy, ignorance) and the three poisons (i.e., attachment, anger, ignorance), along with Shenpa and compassionate abiding (Chodron 2007; Kongtrul 2008; Kyabgon, 2004). There were eight weekly training sessions for this curriculum, with one-on-one training by the trainer (Singh et al., 2014). In Hwang and colleagues (2015) the authors created their own mindfulness protocol that followed a basic structure of mindfulness, similar to MBSR (Brantley, 2005), and training consisted of eight weekly sessions with a two month self-practice period. Another study implemented a mindfulness and acceptance-based protocol that emphasizes the psychoeducation of mindfulness and emotion regulation strategies (Connor & White, 2017). Training consisted of eight, 2.5-hour long group sessions and all sessions engaged in meditation practice, ranging from three minutes to an hour long.

Mindfulness and self-regulation theory.

Although several mindfulness protocols used are evidenced-based (e.g., MBCT), most studies did not discuss or test for mechanisms that help explain the relationship between mindfulness and self-regulation theory. The Soles of the Feet studies discuss how the protocol promotes self-regulation skills but does not discuss the protocol in regard to the theory (Singh et al., 2011a; Singh et al., 2011b). Only one study discusses a theory regarding mindfulness, which is self-determination theory (Hwang et al., 2015). Overall, the studies predominantly focus and investigate the outcomes seen in the participants following the completion of the MBI.

Discussion

This review identified 12 studies that investigated the effectiveness of MBIs on mental health outcomes for individuals with ASD. The mental health outcomes investigated and outcome measures utilized were reported to see any patterns or themes among the studies. Additionally, mindfulness components, such as the protocol followed, and theories related to self-regulation, was reviewed. The studies reviewed highlight how the practice may be effective in supporting the mental health in individuals with ASD. For example, practicing mindfulness was associated with a reduction in anxiety, depression, and rumination disorders (de Bruin et al., 2014; Kiep et al., 2014; Spek et al., 2013) and a decreased prevalence of conduct disorders, such as physical aggression and self-injury (Hwang et al., 2015; Singh et al., 2006; Singh et al., 2011a; Singh et al., 2011b; Singh et al., 2014). In addition, improvement in attention and impulsivity (Bögels et al., 2008; Ridderinkhof et al., 2018), emotional and behavioral functioning (Ridderinkhof et al., 2017), and emotion regulation (Connor & White, 2017) was seen following the completion of mindfulness training. The results of studies investigating physical aggression and self-injury (Hwang et al., 2015; Singh et al., 2006; Singh et al., 2011a; Singh et al., 2011b; Singh et al., 2014) are similar to previous research that supports MBIs to be effective in reducing these disorders in individuals with IDD, which can include ASD (Singh et al., 2003; Singh et al., 2006). Moreover, some of the studies found in this review are comparable to another review that identified six studies investigating the efficacy of mindfulness and emphasizing the importance of the practice for those with ASD (Cachia et al., 2016). However, the current review used different search terms and databases, in addition to focusing on self-regulation theory, and

including more recent published studies (e.g., Ridderinkhof et al., 2018).

Furthermore, the findings regarding children and adolescents with ASD are similar to studies investigating MBIs and mental health outcomes in peers without ASD (Schonert-Reichl & Lawlor, 2010; Thompson & Gauntlett-Gilbert, 2008). Kiep et al. (2014) and Spek et al. (2013) were the only studies to investigate MBIs in adults with ASD regarding mental health outcomes. Their findings are similar to other MBIs resulting in improved mental health outcomes for those without ASD, such as chronic medical diseases and working adults (Bohlmeijer, Prenger, Taal, & Cuijpers, 2010; Klatt, Buckworth, & Malarkey, 2009). For the parent-child dyad and/or parent-adolescent dyads, the benefits seen in these studies are in line with other research examining these dyads for the general population (Kochanska et al., 2010; Webster-Stratton, Reid, & Hammond, 2004). Not only are there benefits for the child and/or adolescent, but for the parents as well (Bögels et al., 2008; de Bruin et al., 2014; Hwang et al., 2015; Ridderinkhof et al., 2017; Singh et al., 2006; Singh et al., 2014). There can be several stressors that can impact parents of children and/or adolescents with ASD (Rao & Beidel, 2009), and mindfulness may be one strategy to help address this issue. In addition, parent participation is vital to the success of children and/or adolescents with ASD and involving the parents may further promote them to be mindful (McConachie & Diggle, 2007). These findings underline the value of parental involvement and future studies are needed to further our understanding of these dyad relationships regarding mindfulness.

Although the findings indicate that mindfulness is associated with promoting mental health in individuals with ASD, further research is needed. Only one study

carried out a RCT (Spek et al., 2013). In addition, several studies utilized multiple-baseline across subjects, which is a type of single subject design (Singh et al., 2006; Singh et al., 2011a; Singh et al., 2011b; Singh et al., 2014). Single subject research provides sound evidence of a behavioral intervention (Horner et al., 2005) and can benefit individuals who may require individualized training, such as individuals with ASD (Hwang & Kearney, 2013). However, single subject design is limited in its use of benefitting multiple individuals (Hwang & Kearney, 2013). Diversifying research methods, for example a group design, can reach a larger amount of people (Hwang & Kearney, 2013). In general, more robust study designs are needed in understanding the causal relationships between mindfulness and mental health outcomes in individuals with ASD.

The outcome measures used to test the effectiveness of mental health outcomes in individuals with ASD varied across the studies. However, this is not surprising considering the range of mental health outcomes observed in the studies. Most studies discussed reliability and validity, yet all the measurements administered to determine effects of the MBI were self-report questionnaires. Although self-reports by individuals with ASD are found to be valid and reliable (Shipman, Sheldrick, & Perrin, 2011), these measures are still subject to bias (Adams, Soumerai, Lomas, & Ross-Degnan, 1999). Future studies need to explore other outcome measurements that do not rely solely on self-report questionnaires, such as behavioral observation as conducted by Singh et al. (2011a) or other innovative methods.

An additional finding concerning the outcome measurements used in the identified studies were those that measured the degree

of mindfulness in the individuals with ASD. Only Bögels et al. (2008), de Bruin et al. (2014), Hwang et al. (2015), and Ridderinkhof et al. (2017) assessed state mindfulness in individuals with ASD, which refers to the quality of mindfulness in an individual at a particular moment (Brown & Ryan, 2003). It is essential to determine how an MBI can influence an individual with ASD to be mindful. Individuals with ASD are generally not mindful, due to lack of knowledge or awareness of the practice (Chapman & Mitchell, 2013). In order for individuals with ASD to cultivate and benefit from the practice, future studies need to measure the degree of how mindful the participants become from the mindfulness training.

All of the mindfulness protocols used in the studies were modified or tailored for individuals with ASD. The Soles of the Feet conducted in Singh et al. (2011a) and Singh et al. (2011b) is a mindfulness program that is specifically designed for those with IDD, which includes ASD. However, this protocol was created to address conduct disorders and limits its use to treat other mental health disorders. Similarly, MBCT is a mindfulness program that is designed to primarily treat depression disorders (Segal et al., 2004). Although Kiep et al. (2014) and Spek et al. (2013) explored the effects of this particular mindfulness curriculum on depression, Bögels et al. (2008) focused on attention and impulsivity outcomes. The authors emphasized specific themes from MBCT, such as the relationship between attention/impulsivity and mindfulness. Future studies that implement MBIs need to use mindfulness-based protocols that address the mental health outcomes to be observed. Moreover, additional mindfulness programs are needed that do not have to be altered or tailored, but are designed specifically for individuals with ASD.

Limitations

One limitation observed from the mindfulness-based protocols used in the studies are the trainers employed to implement the mindfulness training to the participants. All trainers were certified or experienced with mindfulness, however not all of the trainers had previously worked with individuals with ASD (e.g., Bögels et al., 2008). It is important for trainers to have prior experience in order to understand the unique needs of this population and how to accommodate them. Another limitation from the identified studies was the lack of discussion of self-regulation theory or testing of underlying mechanisms (e.g., attention regulation). Only Hwang et al. (2015) discussed theories related to mindfulness (i.e., self-determination theory). Investigating the theories and mechanisms underlying the observed mental health benefits of mindfulness training and practice is needed to further our understanding of the effects of mindfulness in individuals with ASD.

Implications for Research

The findings from this systematic literature review have important implications for future research on mindfulness and those with ASD. The findings showed that there were positive mental health outcomes for individuals with ASD completing the MBIs but additional research is needed to expand on these findings. The studies identified used a variety of MBI strategies and programs. Future research could engage in some comparisons of the effectiveness of these programs. The studies identified in this review need further replication in order to establish them with a variety of ages and ability levels. Moreover, the included studies measured a variety of individual mental health outcomes. Additional studies that measure the same

interventions using the same outcome measures would further inform this field.

Implications for Practice

This systematic review has several implications for practice for researchers, families, and teachers. This review identified 12 studies where an MBI benefited individuals with ASD. The studies reviewed used a variety of mindfulness intervention strategies all of which were found to have positive outcomes. This indicates that researchers, families, and teachers have multiple potential mindfulness strategies to implement, in case one mindfulness strategy does not work for an individual with ASD. Another implication for practice is that practitioners will need professional development on effectively implementing these practices.

Conclusion

This review identified 12 studies and assessed the effects of MBIs on mental health outcomes in individuals with ASD. The

studies and their findings show how mindfulness may be one strategy that can support the mental health in individuals with ASD. However, mindfulness research in this population is still in its infancy and future research is needed to address specific gaps in the literature. For example, more rigorous research designs and methodologies that can further our understanding of how mindfulness can support this underserved population. Another is robust mindfulness-based protocols and the need for innovative methods of promoting mindfulness is crucial for this population to learn and cultivate the practice. Furthermore, the current studies focused solely on addressing mental health outcomes. Although this is valuable, investigating the mechanisms underlying self-regulation or other theories can provide insight on how mindfulness influences individuals with ASD. Addressing these specific gaps in the literature can expand on current strategies to promote mindfulness in individuals with ASD and our understanding of why it is effective.

References

- Adams, A. S., Soumerai, S. B., Lomas, J., & Ross-Degnan, D. (1999). Evidence of self-report bias in assessing adherence to guidelines. *International Journal for Quality in Health Care, 11*, 187-192. <http://doi.org/10.1093/intqhc/11.3.187>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Baker, K. D., & Skuse, D. H. (2005). Adolescents and young adults with 22q11 deletion syndrome: psychopathology in an at-risk group. *The British Journal of Psychiatry, 186*, 115-120. <http://dx.doi.org/10.1192/bjp.186.2.115>
- Baumeister, R. F., & Vohs, K. D. (2003). *Self-regulation and the executive functioning of the self*. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of Self and Identity* (pp. 197–217). New York: Guilford Press.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., ... Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*, 230-241. <https://doi.org/10.1093/clipsy.bph077>
- *Bögels, S., Hoogstad, B., van Dun, L., de Schutter, S., & Restifo, K. (2008). Mindfulness training for adolescents with externalizing disorders and their parents. *Behavioral and Cognitive Psychotherapy, 36*, 193-209. <http://doi.org/10.1017/S1352465808004190>

- Bohlmeijer, E., Prenger, R., Taal, E., & Cuijpers, P. (2010). The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: A meta-analysis. *Journal of Psychosomatic Research*, *68*, 539-544.
<http://doi.org/10.1016/j.jpsychores.2009.10.005>
- Brantley, J. (2005). *Mindfulness-based stress reduction*. In S. M. Orsillo & L. Roemer (Eds.), *Acceptance and Mindfulness-Based Approaches to Anxiety* (pp. 131-145). Boston, MA: Springer.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*, 822.
<http://doi.org/10.1037/0022-3514.84.4.822>
- Cachia, R. L., Anderson, A., & Moore, D. W. (2016). Mindfulness in individuals with autism spectrum disorder: a systematic review and narrative analysis. *Review Journal of Autism and Developmental Disorders*, *3*, 165-178.
- Chapman, M. J., & Mitchell, D. (2013). Mindfully valuing people now: an evaluation of introduction to mindfulness workshops for people with intellectual disabilities. *Mindfulness*, *4*, 168-178.
- Chodron, P. (2007). *Don't bite the hook: Finding freedom from anger, resentment, and other destructive emotion*. Boston, MA: Shambhala.
- *Conner, C. M., & White, S. W. (2017). Brief report: Feasibility and preliminary efficacy of individual mindfulness therapy for adults with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 1-11. <http://doi.org/10.1007/s10803-017-3312-0>
- *de Bruin, E. I., Blom, R., Smit, F. M., van Steensel, F. J., & Bögels, S. M. (2014). *MYmind*: Mindfulness training for youngsters with autism spectrum disorders and their parents. *Autism*, *19*, 906-914. <http://doi.org/10.1177/1362361314553279>
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behavior Research and Therapy*, *44*, 1-25. <http://doi.org/10.1016/j.brat.2005.06.006>
- Hofvander, B., Delorme, R., Chaste, P., Nydén, A., Wentz, E., Ståhlberg, O., ... Råstam, M. (2009). Psychiatric and psychosocial problems in adults with normal-intelligence autism spectrum disorders. *BioMed Central Psychiatry*, *9*, 35. <http://doi.org/10.1186/1471-244x-9-35>.
- Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, *6*, 537-559.
<http://doi.org/10.1177/1745691611419671>.
- 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*, 165-179.
- Hwang, Y. S., & Kearney, P. (2013). A systematic review of mindfulness intervention for individuals with developmental disabilities: Long-term practice and long lasting effects. *Research in Developmental Disabilities*, *34*, 314-326.
<http://doi.org/10.1016/j.ridd.2012.08.008>.
- *Hwang, Y. S., Kearney, P., Klieve, H., Lang, W., & Roberts, J. (2015). Cultivating mind: mindfulness interventions for children with autism spectrum disorder and problem behaviours, and their mothers. *Journal of Child and Family Studies*, *24*, 3093-3106.
<http://doi.org/10.1007/s10826-015-0114-x>

- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York: Delta.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10, 144-156. <https://doi.org/10.1093/clipsy.bpg016>
- Kabat-Zinn, M., & Kabat-Zinn, J. (1997). *Everyday blessings: The inner work of mindful parenting*. New York: Hyperion.
- *Kiep, M., Spek, A. A., & Hoeben, L. (2014). Mindfulness-based therapy in adults with an autism spectrum disorder: Do treatment effects last? *Mindfulness*, 6, 637-644. <http://dx.doi.org/10.1007/s12671-014-0299-x>
- Klatt, M. D., Buckworth, J., & Malarkey, W. B. (2009). Effects of low-dose mindfulness-based stress reduction (MBSR-ld) on working adults. *Health Education & Behavior*, 36, 601-614. <http://doi.org/10.1177/1090198108317627>
- Kochanska, G., Woodard, J., Kim, S., Koenig, J. L., Yoon, J. E., & Barry, R. A. (2010). Positive socialization mechanisms in secure and insecure parent-child dyads: Two longitudinal studies. *Journal of Child Psychology and Psychiatry*, 51, 998-1009. <http://dx.doi.org/10.1111/j.1469-7610.2010.02238.x>
- Kongtrul, D. (2008). *Light comes through: Buddhist teaching on awakening to our natural intelligence*. Boston, MA: Shambhala.
- Kyabgon, T. (2004). *Mind at ease: Self-liberation through Mahamudra meditation*. Boston, MA: Shambhala.
- Lord, C., Risi, S., DiLavore, P. S., Shulman, C., Thurm, A., & Pickles, A. (2006). Autism from 2 to 9 years of age. *Archives of General Psychiatry*, 63, 694-701. <http://doi.org/10.1001/archpsyc.63.6.694>
- McConachie, H., & Diggle, T. (2007). Parent implemented early intervention for young children with autism spectrum disorder: A systematic review. *Journal of Evaluation in Clinical Practice*, 13(1), 120-129. <http://doi.org/10.1111/j.1365-2753.2006.00674.x/full>
- Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., ... & Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, 4, 1-9. <https://doi.org/10.1186/2046-4053-4-1>
- Rao, P. A., & Beidel, D. C. (2009). The impact of children with high-functioning autism on parental stress, sibling adjustment, and family functioning. *Behavior Modification*, 33(4), 437-451. <https://doi.org/10.1177/0145445509336427>
- *Ridderinkhof, A., de Bruin, E. I., Blom, R., & Bögels, S. M. (2017). Mindfulness-based program for children with autism spectrum disorder and their parents: Direct and long-term improvements. *Mindfulness*, 1-19. <http://doi.org/10.1001/s12671-017-0815-x>
- *Ridderinkhof, A., de Bruin, E. I., van den Driesschen, S., & Bögels, S. M. (2018). Attention in children with autism spectrum disorder and the effects of a mindfulness-based program. *Journal of Attention Disorders*, 1-12. <https://doi.org/10.1177/1087054718797428>
- Robins, C. J., & Rosenthal, M. Z. (2011). Dialectical behavior therapy. In J. D. Herbert & E. M. Forman (Eds.). *Acceptance and mindfulness in cognitive behavior therapy: Understanding and applying the new therapies*, (pp.164-192). Hoboken, NJ: Wiley.

- Schonert-Reichl, K. A., & Lawlor, M. S. (2010). The effects of a mindfulness-based education program on pre-and early adolescent's well-being and social and emotional competence. *Mindfulness, 1*, 137-151.
- Segal, Z. V., Teasdale, J. D., & Williams, M. G. (2004). *Mindfulness-based cognitive therapy: Theoretical rationale and empirical status*. In S. C. Hayes, V. M. Follette & M. M. Linehan (Eds.), *Mindfulness and acceptance: Expanding the cognitive-behavioral traditions* (pp. 45-65). New York: Guilford Press.
- Shipman, D. L., Sheldrick, R. C., & Perrin, E. C. (2011). Quality of life in adolescents with autism spectrum disorders: Reliability and validity of self-reports. *Journal of Developmental and Behavioral Pediatrics, 32*, 85-89. <http://doi.org/10.1097/DBP.0b013e318203e558>
- Simonoff, E., Pickles, A., Charman, T., Chandler, S., Loucas, T., & Baird, G. (2008). Psychiatric disorders in children with autism spectrum disorders: Prevalence, comorbidity, and associated factors in a population-derived sample. *Journal of the American Academy of Child & Adolescent Psychiatry, 47*, 921-929. <http://doi.org/10.1097/CHI.0b013e318179964f>
- *Singh, N. N., Lancioni, G. E., Manikam, R., Winton, A. S., Singh, A. N., Singh, J., & Singh, A. D. (2011a). A mindfulness-based strategy for self-management of aggressive behavior in adolescents with autism. *Research in Autism Spectrum Disorders, 5*, 1153-1158. <https://doi.org/10.1177/0145445513476085>
- *Singh, N. N., Lancioni, G. E., Singh, A. D., Winton, A. S., Singh, A. N., & Singh, J. (2011b). Adolescents with Asperger syndrome can use a mindfulness-based strategy to control their aggressive behavior. *Research in Autism Spectrum Disorders, 5*, 1103-1109. <http://doi.org/10.1007/s12671-012-0180-8>
- Singh, N. N., Lancioni, G. E., Winton, A. S., Curtis, W. J., Wahler, R. G., Sabaawi, M., ... & McAleavey, K. (2006). Mindful staff increase learning and reduce aggression in adults with developmental disabilities. *Research in Developmental Disabilities, 27*, 545-558. <https://doi.org/10.1016/j.ridd.2005.07.002>
- *Singh, N. N., Lancioni, G. E., Winton, A. S., Fisher, B. C., Wahler, R. G., McAleavey, K., ... & Sabaawi, M. (2006). Mindful parenting decreases aggression, noncompliance, and self-injury in children with autism. *Journal of Emotional and Behavioral Disorders, 14*, 169-177. <https://doi.org/10.1177/0145445507300924>
- *Singh, N. N., Lancioni, G. E., Winton, A. S., Karazsia, B. T., Myers, R. E., Latham, L. L., & Singh, J. (2014). Mindfulness-based positive behavior support (MBPBS) for mothers of adolescents with autism spectrum disorder: Effects on adolescents' behavior and parental stress. *Mindfulness, 5*, 646-657. <http://doi.org/10.1007/s10826-015-0193-8>
- Singh, N. N., Wahler, R. G., Adkins, A. D., Myers, R. E., & Mindfulness Research Group. (2003). Soles of the feet: A mindfulness-based self-control intervention for aggression by an individual with mild mental retardation and mental illness. *Research in Developmental Disabilities, 24*, 158-169. [http://doi.org/10.1016/S0891-4222\(03\)00026-X](http://doi.org/10.1016/S0891-4222(03)00026-X)
- *Spek, A. A., Van Ham, N. C., & Nyklíček, I. (2013). Mindfulness-based therapy in adults with an autism spectrum disorder: A randomized controlled trial. *Research in Developmental Disabilities, 34*, 246-253. <http://doi.org/10.1016/j.ridd.2012.08.009>
- Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based

- cognitive therapy. *Journal of Consulting and Clinical Psychology*, 68, 615-623.
<https://doi.org/10.1037/0022-006X.68.4.615>
- Thompson, M., & Gauntlett-Gilbert, J. (2008). Mindfulness with children and adolescents: Effective clinical application. *Clinical Child Psychology and Psychiatry*, 13, 395-407.
<http://doi.org/10.1177/1359104508090603>
- Unwin, G. L., & Deb, S. (2011). Efficacy of atypical antipsychotic medication in the management of behavior problems in children with intellectual disabilities and borderline intelligence: A systematic review. *Research in Developmental Disabilities*, 32, 2121-2133.
- Van der Oord, S., Bögels, S. M., & Peijnenburg, D. (2012). The effectiveness of mindfulness training for children with ADHD and mindful parenting for their parents. *Journal of Child and Family Studies*, 21, 139-147. <http://doi.org/10.1007/s10826-011-9457-0>
- Vohs, K. D., & Baumeister, R. F. (2011). *Handbook of self-regulation: Research, theory, and applications* (2nd ed.). New York, NY: Guilford.
- Webster-Stratton, C., Reid, M. J., & Hammond, M. (2004). Treating children with early-onset conduct problems: Intervention outcomes for parent, child, and teacher training. *Journal of Clinical Child and Adolescent Psychology*, 33(1), 105-
- Westling, D. L., & Fox, L. (2009). *Teaching students with severe disabilities*. New Jersey: Pearson Education.

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But for Whom? A Review of Participant Characteristics in a Special Education Journal

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Abstract: Reviews of research participant demographics are not new (i.e., Pierce et al., 2014; West et al., 2016) and the extension toward identifying “for whom” practices are evidence-based has been discussed previously (West, McCollow, Umbarger, Kidwell, & Cote, 2013). However, situating the importance of context and intersectionality for research conducted for individuals with intellectual and developmental disability extends the discussion. This review examined participant characteristics in a special education focused journal across a 15-year period. Results indicate participant demographic information is underreported in published research. Even when information is reported, a lack of representation across race and ethnicity, socioeconomic status, gender, and language is indicated. This work is an attempt to extend previous literature on participant characteristics reported in published research by examining a body of research from a journal on education for individuals with intellectual and developmental disability. Implications and future research are discussed.

Why does the issue of participant demographics matter? What can we learn by examining the demographic characteristics of research participants? What is missing if we don't examine and understand who is included in research study participation? These questions and more have been posed around the research engaged in examining participant characteristics. While the answers may be “it doesn't matter,” or “nothing,” consider if the responses to the questions are, instead, “it matters a great deal when we consider the cultural, linguistic, and socio-economic backgrounds of research participants,” and “we can learn how to effectively modify and adjust practices to better fit the contexts within which these practices are used,” and “we miss an entire

population of individuals for whom these practices are intended to support and improve outcomes for.” What if those are the answers we can find by examining the participant characteristics of those individuals included in research studies? Without thoughtful examination, the answers may be lost. Of course, examining demographic characteristics of research participants is only a first step in understanding where we stand as a field in the diversity and inclusion of participants from various cultural, linguistic, socio-economic, immigration, and ability backgrounds, plus many more aspects of identity. So, how did we get to the point of examining the participant characteristics of studies included in research- and evidence-based practices?

Understanding for Whom

The discussion on evidence-based practices (EBPs) for learners with autism spectrum disorders (ASD) and developmental disabilities and what constitutes the evidence-base continues as it has for the past few decades (i.e., Cook, Tankersley, & Landrum, 2009; Odom, 2009; Odom et al. 2005). Meanwhile, a shift has occurred in the focus of this discussion on to working toward describing for whom practices are evidence-based (Pierce et al., 2014; West, McCollow, Umbarger, Kidwell, & Cote, 2013; West et al., 2016). It is becoming apparent there is a desire to more fully understand the population from whom evidence-based practices are derived.

Exploring the population from whom evidence-based practices are derived is running parallel to discussion on the implementation of evidence-based practices and the ways in which practices are taken up. This focus should be a critical component of implementation exploration. For example, in the field of psychology, there is discussion on the impact of culture and language on identified evidence-based practices or treatments (Bernal, Jiménez-Chafey, & Domenech Rodríguez, 2009). Other fields are also taking steps to explore the impact of culture and language in conjunction with the work that has been done to identify EBPs, such as mental health (Anthony, Rogers, & Farkas, 2003; Whaley & Davis, 2007) and nursing (Engebretson, Mahoney, & Carlson, 2008).

It is clear that, while the 1990s were an era for defining evidence-based practices, the 2000s and 2010s are becoming a time of understanding “for whom” practices are evidence-based. For how can practitioners be confident a practice will work for their population if research has not explored the populations with whom they work?

Diversity and Disability

Individuals do not live within vacuums. Identity comes in many forms including race, ethnicity, language, culture, gender identity, sexual orientation, and disability. Without encompassing the entirety of an individual’s identity, key aspects of who they are remain hidden. Historically, diversity and disability have been described as on “parallel nonconvergent paths” (Dukes & Lamar-Dukes, 2009). To better understand the effects of interventions, including evidence-based practices, it must be acknowledged that individuals live within the cross-section of multiple identities. And, a shift in attitude, that diversity is an important aspect of an individual and that identities such as race, ethnicity, culture, language, gender identity, sexual orientation, and religion may have an impact on the effectiveness of interventions, may indeed be in order (Dukes & Lamar-Dukes, 2009).

By not recognizing the cross-sections within which an individual lives, these individuals may be forced to ignore part of their identity because of the assumptions of others. In an article describing children with autism spectrum disorders (ASD) whose families have been encouraged to use only one language, despite having a home language different from the community within which they live, research evidence is described that indicates there is no disadvantage to children with ASD being bilingual (Griswold, 2016). The prevailing recommendation that children with ASD should remain monolingual, with the rationale that having an impairment in language indicates a need to remain monolingual, reflects an attitude of ignorance toward the importance of multiple identities for individuals with disabilities. In the available research on bi- and multilingual children and youth with ASD, there is no indication of detrimental effects (e.g., delays

in language development) and using multiple languages may, in fact, improve social interaction (Hambly & Fombonne, 2012; Petersen, Marinova-Todd, & Miranda, 2012). By limiting children and youth with ASD to one language, we are ignoring a vital aspect of their identity – their culture and home language – all without scientific evidence to suggest these children and youth should be limited to one language, one culture (Griswold, 2016).

Previous Reviews Examining Diversity of Participants

Reviews focused on the reporting of participant characteristics are not unique. Pierce and colleagues (2014) examined three autism-focused journals and found an overall underreporting of participant demographic information, specifically the reporting of ethnicity. West and colleagues (2016) examined the studies that comprise evidence-based practices for children, youth, and young adults with ASD as identified by the National Professional Development Center on Autism Spectrum Disorders (Wong et al., 2015) and found a lack of representation of diverse participants across all studies included in the evidence base. Diversity-focused reviews have also focused on other disability categories such as specific learning disabilities (Artiles, Trent, & Kuan, 1997; Vasquez III et al., 2011).

The purpose of this study was to examine articles published in the journal *Education and Training in Autism and Developmental Disabilities (ETADD)* across a 15-year span for author reporting of participant demographics. Through this study, we seek to expand the literature by providing an analysis of a broader range of participant characteristics. The following research questions guided our work: (a) To what extent did studies included in *ETADD* from 2004-2018 describe participant race, ethnicity,

nationality, gender, home language, socio-economic status, and sexual orientation? and (b) What were the demographic characteristics (race, ethnicity, nationality, gender, home language, socio-economic status, and sexual orientation) of participants in studies included in *ETADD* from 2004-2018?

Method

The researchers utilized methods similar to West et al. (2016) in their review of participant diversity within the evidence-based practices for children and young adults with autism spectrum disorders as described by Wong et al. (2015).

Data Collection and Analysis

Review criteria associated with high-quality special education research were identified around demographic categories (Cook et al., 2014; Gersten et al., 2005; Horner et al., 2005; Mulcahy, Krezmien, & Travers, 2015). Five authors held faculty positions in special education across four universities in the United States. The sixth author was a doctoral student in special education at a university in the United States. All authors indicated experience in data collection and analysis procedures as well as interest in the topic of diversity and inclusion of research participants in the field of special education. Five authors served as a reviewer and examined a set of volumes (i.e., years) of the target journal. The reviewing authors examined articles in *ETADD* from 2004 to 2018 based upon interest and expertise in the year the journal was published. The reviewers retrieved the respective studies and coded according to the established categories. Reviewers examined definitions of race and ethnicity, gender, setting, immigration status, language, socio-economic status, and disability category. A sixth author conducted interrater reliability.

Exclusion of articles. Articles that contained literature reviews, policy briefs, or other types of papers that did not involve direct research participants, including studies of large datasets for secondary analysis, were excluded from the study. To focus on research conducted specifically for school-age learners, only research that included participants ages 3-21 years old were included. In instances where the data could not be aggregated to include only participants between 3 and 21 years old, the study was excluded from coding. In addition, studies that involved only parents, educators, or caregivers of individuals with intellectual or developmental disability were excluded.

Defining “race” and “ethnicity”. The researchers utilized the definitions of race and ethnicity from the U.S. Census Bureau (2017). Ethnicity is defined as a group of people who share the same values, cultural practices, etc. (U.S. Census Bureau, 2017). The designations used to categorize U.S. citizens, resident aliens, and other eligible non-citizens are: Hispanic or Latino, Not Hispanic or Latino. While the researchers recognize ethnicity is more complicated than this definition, it was determined the team would utilize the definition provided by the U.S. Census Bureau. Race is socially constructed and based on features attributed to specific groups of people (López, 1994). The researchers utilized codes using the definitions of race utilized by the 2017 US Census Bureau (i.e., White, African American, American Indian, Asian, Native American, etc.).

Coding process. Adjustments to the type of data to be collected were made via discussion with the researchers when unanticipated issues regarding reporting occurred. The team, having been involved in the West et al. (2016) review, agreed from the beginning that in cases of international studies,

nationality of participants would be presumed according to where the study occurred when race or ethnicity was not explicitly stated. Four specific issues arose. First, when the setting of the study was described, the authors discussed that examples of “setting” included classroom, clinic, community pool and non-examples included city, state, region, country. However, after further discussion, it was decided the researchers would code both the location of the study and the setting in two separate categories. The next issue the researchers encountered was in the description of participant immigration status. Frequently, the immigration status of participants was not reported clearly, leaving the researchers to determine it would be appropriate to assume participants had immigrated to the United States if there was mention of an origin country and the study occurred within the United States. Another issue the researchers faced was in the reporting of participant primary language. In some studies, parent or caregiver primary language was reported without specific reporting of participant primary language. The researchers decided to code participant primary language only if it was reported as “participant speaks Spanish,” or “parents speak English and Spanish.” Finally, the team decided to code socio-economic status for participants when indicators such as “receives free and reduced lunch” or income of participant or participant caregiver(s) was reported.

After all studies from the years examined were independently reviewed and the individual databases were completed, they were combined into a single database by the lead author and interrater reliability procedures began.

Interrater Reliability

To ensure the reliability of the collected data, we instituted a multi-step process that included interrater training, independent data collection, results comparison, and scoring calculation. One author not involved in initial coding was provided with an empty data sheet template, two pre-selected articles, and the instructions the other authors used for completing the table. Upon completion of coding for the two articles, the interrater met with the first author and compared results of the two studies with previously collected data. The total number of agreements was divided by the total number of agreements plus total number of disagreements and multiplied by 100. This reliability training resulted in 100% agreement. Next, approximately 37% ($n = 160$) of articles were randomly selected from the pool of 435 and were provided to the reliability rater. The reliability rater then completed coding and provided results to the first author who then calculated reliability.

To maintain a conservative reliability estimate, an agreement was obtained only when all data (i.e., race/ethnicity, language, number of participants, setting, gender, and socioeconomic status) for the study collected by the interrater were identical to the data collected by the original reviewer (i.e., study-by-study reliability). If one datum (e.g., race) for a study differed between the two raters, a disagreement was scored for the entire study. Once completed, the number of agreements was divided by the number of agreements plus number of disagreements and multiplied by 100%. Interrater agreement was 94.6%.

Results

Articles for this review came from the same peer reviewed journal, *ETADD*. Articles from the years 2004-2018 were reviewed for a total of 435 included articles. Of the 435 studies identified, 328 (75.4%) reported on participant gender while 125 (28.73%)

reported on race, ethnicity, or nationality (REN).

Participants Involved in the Studies

A total of 5947 participants were identified across the 435 studies that met the criteria for being coded. Tables 1-3 provide an overview of the participant characteristics related to gender, race, ethnicity, nationality, and language.

Gender. Of the 5110 participants with gender reported, 3228 were male (63.17%), 1882 were female (36.83%; see Table 1). No studies reported on other gender identities (e.g., gender non-conforming, non-binary, transgender). There were 837 participants whose gender was not reported in the studies reviewed.

Sexual orientation. No studies included information on participant sexual orientation.

Race and ethnicity. A total of 125 of the 435 studies (28.73%) reported some category of race or ethnicity (excludes nationality) for 2495 participants (41.95% of all participants in the 435 studies; see Table 2). Within the 125 studies that reported REN, 1571 participants (62.97%) were identified racially as White using some of the following category labels: White, European American, Euro-American, and Caucasian. Participants whose race was reported as African American or Caribbean American comprised 508 (20.36%) of total reported. Latino/a participants comprised 250 (10.02%) of reported participants. Additionally, 26 (1.04%) of participants were reported as Asian American, 3 (0.12%) of participants were reported as Native Hawaiian or other Pacific Islander. Participants reported as Middle Eastern comprised 4 (0.16%) of the total reported participants. And, one (0.04%)

Table 1. *Number and Percentage of Participants by Gender across Studies*

	<i>Number</i>	<i>Percentage</i>
Male	3228	63.17%
Female	1882	36.83%
Other Gender Identity	NR	
Total Participants with Gender Reported	5110	

NR = Not Reported

Table 2. *Number and Percentage of Participant Characteristics by Race/Ethnicity across Studies*

<i>Race/Ethnicity</i>	<i>Number</i>	<i>Percentage</i>
<i>White</i>	1571	62.97%
<i>African or Caribbean American</i>	508	20.36%
<i>Latino/a</i>	250	10.02%
<i>Asian American</i>	26	1.04%
<i>Native Hawaiian or Other Pacific Islander</i>	3	0.12%
<i>Middle Eastern</i>	4	0.16%
<i>American Indian or Alaskan Native</i>	1	0.04%
<i>Other</i>	132	5.29%
<i>Total Participants Reported</i>	2495	

Note. White comprised participants described as White; European American, Euro-American, and Caucasian.

participant was identified as American Indian or Alaskan Native. Participants reported as “Other” comprised 132 (5.29%) of total participants.

Nationality. In analyzing the participants, several studies were conducted in countries other than the United States (e.g., Turkey, Israel). When studies conducted outside the United States were encountered, researchers coded participants by the country within which they participated. That is, nationality was identified rather than race/ethnicity. Of the total participants, 849 participants were identified by a nationality outside the United States: 171 Spanish, 277 Canadian, 102 Turkish, 60 Australian, 60

Serbian, 57 Israeli, 41 Dutch, 29 Japanese, 8 Scottish, 7 South Korean, 13 Taiwanese, 4 Greeks, 2 Icelandic, 1 Korean, 8 British, and 8 Nigerian.

United States nationality was identified using the racial and ethnic categories where references were made to American. For example, terminology related to the 508 African or Caribbean American participants, the 26 Asian American participants, and the 1 Native American was counted as race/ethnicity.

There were 2603 participants whose REN were not reported in studies included in this review.

Home language. Across the 435 studies included in this review, 28 (0.06%) studies explicitly identified participant language(s) (see Table 3). A variety of languages were reported, including participants who spoke English, Spanish, Polish, Arabic, Hindi, Japanese, and Mandarin. A few studies reported participants who spoke more than one language. These included studies in which participants spoke English and Spanish, Farsi and English, Korean and Turkish, Polish and English, and Arabic and English. There were instances when language was not explicitly stated, though the country in which the study occurred was stated. In those cases, the researchers did not assume a home language for participants.

Socioeconomic status. Of the 435 studies reviewed a total of 16 reported on participant social economic status (0.04%), giving indicators such as eligibility for free or reduced lunch and/or parent/family income levels.

Demographic reporting across years. Over the 15 years of journals that were reviewed race/ethnicity was not reported at the same consistency as gender. The reviewers did a comparison by year of race/ethnicity reported to gender. Table 4 provides a year by year comparison of reporting. The highest percentage of reporting of participant

race/ethnicity was 74.09% in 2004 with the lowest percentage being 3.37% in 2008. The highest percentage of reporting of participant gender was 100% across 8 different years (2009, 2010, 2012, 2015, 2016, 2017, 2018) with the lowest percentage being 61.77% in 2005.

Discussion

In this study, our research team examined the demographics reported in studies published in the journal titled *ETADD* over a 15-year period (2004-2018). Our examination revealed that participant demographic information such as race and ethnicity, socioeconomic status (SES), and home language(s) are underreported in the research published. In addition, gender is not consistently reported.

Even when demographics were reported, we found a lack of diversity among participants in the research. Many studies did not adequately include or report participants whose race or ethnicity was something other than White (e.g., European American, Caucasian). The challenge with these findings is the U.S. Census (Colby & Ortman, 2015) is predicting that by 2020 more than half of the nation’s children under age 18 are expected to be part of a current minority race or ethnic group as the US becomes “majority-minority”. That is, the

Table 3. Home Language(s) Reported by Studies

LANGUAGES	ENGLISH	SPANISH	POLISH	ARABIC	HINDI	JAPANESE	MANDARIN	ENGLISH & SPANISH	FARSI & ENGLISH	KOREAN & TURKISH	ENGLISH & ARABIC	ENGLISH & POLISH	TOTAL
STUDIES	10	3	1	1	1	1	1	6	1	1	1	1	28

minority population will become the majority population. Because we were looking at a journal that focuses on education and disability, the participants in the research we reviewed were typically receiving special education services. According to the U.S. Department of Education (McFarland et al., 2018) during the 2015-16 school year the percentage of students served under the Individuals with Disabilities Education Act (IDEA) was highest for American Indian/Alaska Native students (17%) and Black students (16%). White students were next (14%) followed by students of two or more races (13%), Hispanic students (12%), Pacific Islander students (12%), and Asian students (7%). The number of students served under IDEA Part B represented 13% of the total school population, ages 3-2, during the 2015-16 school year.

With the increasing diversity within our country and the number of individuals from diverse backgrounds being served under

IDEA, it is important to include demographic information in research samples so practitioners can make informed decisions about whom and under what context interventions are most likely to succeed. Federal policies (e.g., IDEA, No Child Left Behind Act, Every Student Succeeds Act) emphasize use of research findings to direct practice in special education (Cook, 2014). Educators are encouraged to use research to identify effective practices for individuals with special learning needs who require highly effective instruction to optimize learner outcomes (Cook, 2014; Dammann & Vaughn, 2001; Slavin, 2002). If the goal is to provide effective practices to individuals, it is critical that complete information about research participants be gathered and reported systematically (Rosenberg et al., 1984).

When looking at the reporting across years, which is a broad overview of reporting

Table 4. Total Participant Race/Ethnicity and Gender Reported by Year

Year	Total Race/Ethnicity Reported	Total Gender Reported	Total N*	Percentage Race/Ethnicity Reported	Percentage Gender Reported
2004	286	294	386	74.09%	76.17%
2005	93	349	565	16.46%	61.77%
2006	681	1354	1415	48.12%	95.68%
2007	817	1098	1496	54.61%	73.39%
2008	6	144	178	3.37%	80.89%
2009	72	215	215	33.48%	100%
2010	50	134	134	37.31%	100%
2011	14	180	197	7.1%	91.37%
2012	90	514	514	17.5%	100%
2013	158	245	249	63.45%	98.39%
2014	66	117	132	50%	88.63%
2015	48	85	85	56.47%	100%
2016	40	96	96	41.66%	100%
2017	38	177	177	21.47%	100%
2018	36	108	108	33.33%	100%
Total Participants	2495	5110	5947		

Total N represents total number of participants in all studies for designated year, whether gender or race/ethnicity were reported or not.

practices by authors, we can see that reporting fluctuates, particularly for reporting of race/ethnicity. While gender (i.e., male/female) is reported more consistently, it is still surprising to see occasions when this information is lacking (e.g., 2005). For race/ethnicity, the variance in reporting on this participant demographic appears to vary quite dramatically across years (range 3.37 - 74%), and has not yet reached 100% of participants having race/ethnicity reported.

Our research mirrors the findings of previous reviews of demographics reported in studies focused on individuals with disabilities. In 1984, the research committee of the Council for Learning Disabilities (CLD) noted that the descriptions of participants in research reports were vague and inconsistent and recognized that this made it difficult to evaluate research findings. CLD recommended some specific guidelines for participation descriptions in research reports (Rosenberg et al., 1984). Lessen, Dudzinski, Karsh, and Van Acker (1989) examined research from 1977-1987 involving individuals with learning disabilities and concluded that translation of research into practice was stymied by a lack of participant and setting descriptions. In 1994, a CLD research committee reported that the vague participant descriptors in research involving individuals with learning disabilities *remained* a concern and reiterated and updated guidelines for the minimum description of participants in educational research. Unfortunately, this vagueness extends today and goes beyond the learning disability literature.

In 1986, Kistner and Robbins made recommendations to improve the inadequacies of the descriptive information of research participants in autism research. Pierce and colleagues (2014), examined ethnicity reporting in three autism journals (*Autism*, *Focus on Autism and Other*

Developmental Disabilities, and *Journal of Autism and Developmental Disorders*) over six years (2000, 2002, 2004, 2006, 2008, and 2010). They found that 72% of the articles they reviewed did not include descriptors of participants' race or ethnicity. These researchers concluded that external validity of research is hampered by limited participant diversity and that replication and correlational research is constrained by the omission of participants' ethnic, racial, and cultural contextual details.

West and colleagues (2016) examined participant characteristics in the evidence-based practice literature identified by the National Professional Development Center on Autism Spectrum Disorders (NPDC-ASD). Results indicated limited representation of diverse participants and when reported the large majority of study participants were White. In the Wong et al. (2015) report, the researchers acknowledged that they did not collect information about race/ethnic/cultural diversity, and underrepresented groups. From reading hundreds of studies, the researchers stated it was their informed opinion that most of the participants in the studies were either White or their race/ethnicity was not described (Wong et al., 2014, p. 34). Families' socioeconomic status was rarely provided as well.

Suggestions for Researchers, Editors, and Research Funders

Over 30 years after the original call for greater uniformity, vague participant descriptors remain a matter of concern. As those before us, we recommend and reiterate that participant descriptions should be included in research reports involving individuals with disabilities. We suggesting considering the following strategies:

1. Define demographic terminology clearly and consistently for terms

such as gender, language(s), race, ethnicity, and socioeconomic status (SES).

2. Require participant information in publication submissions and create minimum guidelines for researchers to report on demographics.
3. Require inclusion of specific participant demographic information in research at the university and government level for awarding of funding.

Definitions. We acknowledge the difficulties associated with gathering descriptive data on participants especially with a lack of standardized identification and clear definitions of demographic terminology. For example, there are not clear definitions and categories adopted for ethnicity and race in educational research. However, an agreement on using consistent terminology is possible, such as using the U.S. Census Bureau definitions or another agreed upon standard definition. In addition, the American Psychological Association (APA) has provided guidelines for describing race and ethnicity (APA, 2010, pp. 75-76). In addition to describing race and ethnicity, sufficient description of other participant demographic information such as language(s) and socioeconomic status as well as additional information as relevant, such as sexual orientation, religion, immigration status, etc. (also provided in the APA manual). Indeed, we encourage researchers to follow guidelines provided by APA, particularly guidelines regarding bias, specificity, and sensitivity (APA, 2010, pp. 70-76).

Providing this information gives clear details that are necessary for providing understanding of the context within which the study was conducted. Research journals can encourage this specificity through

submission guidelines that include providing descriptive information on participants.

Publication requirements. Standards for the description of participants should be viewed as an important step in reporting research and a requirement for inclusion in a publication. While page constraints in publications may be a contributing factor in the lack of demographics presented in research articles, providing sufficient information on research participants should be a minimum standard. Journals need to find a way to balance the need for information with the page constraints required for publication.

Meaningful and generalizable data can only occur if results and outcomes are contextualized by participant characteristics. Limited and vague participation descriptions make it difficult to evaluate research findings or to discern whether an intervention may be effective with a subgroup of individuals. We recommend, like those before us, that researchers thoroughly describe participants' demographics both in a table and accompanying narrative. We recommend that, at minimum, the following information be included in participant descriptions:

- Number of participants
- Gender (e.g., male, female, other gender identity) of participants
- Ages of participants
- Race, ethnicity, and/or nationality of participants
- Participant language(s)
- Intellectual (i.e., IQ) status of participants
- Relevant achievement and/or adaptive behavior levels of participants

Additional information that further describes the participants to give better context should also be included (e.g., sexual orientation, socio-economic status), whether within a

table or a narrative. For research focused on instruction the instructional setting (e.g., use of IDEA descriptions of educational placements) should also be included. Information not included should be reported as a limitation of the study.

University and government research requirements. Our research team urges faculty in institutes of higher education instructional positions to promote the use of demographic guidelines early with their students completing research papers, dissertations, theses, and research projects. Similarly, funding agencies should promote that research projects involve diverse participants and ensure that proposed projects contain adequate means for identifying and describing demographics when reporting results (Hammill, Bryant, Brown, Dunn, & Marten, 1989).

Limitations

This review is an examination of the reporting of participant demographic information, including race/ethnicity, nationality, language, gender, socio-economic status, and sexual orientation, in one special education focused journal across 15 years. This review represents a small sample of a journal with a long history (established in 1966 under the title *Education and Training of the Mentally Retarded*). Reviewing a short period of a journal with a long history should be viewed as a limitation. We also recognize that for the purposes of coding participant demographic information, we presumed nationality based on countries in which studies occurred (e.g., Turkey) without sensitivity to the ways in which race and ethnicity may be viewed from the perspective of those within those countries. We recognize that the analysis did not include age of participants, which could have an effect on highlighting more specific interaction related to race/ethnicity and

gender if the analysis took this information into account. In addition, we did not include the settings of studies (e.g., classroom, community) in the analysis. We also recognize we did not include analysis on participant diagnosis. Given the articles were collected from a journal focused on autism and developmental disabilities, researchers decided to not include this coding. However, information on participant diagnosis or participant disability would provide further insight into participant demographics. Finally, the journal represents a wide range of topics covered in studies related to education and instruction for individuals with intellectual and developmental disability. However, the range of topics was not considered in the analysis. Thus, a limitation of the study is in not examining the interactions that may occur when taking into consideration all components (i.e., race/ethnicity, gender, age, setting, topic, etc.).

Key Implications

Reporting demographics in future studies would allow replication research to be conducted based on participant's diverse backgrounds. "Confidence in knowledge claims generated from research is justified to the extent that findings are replicated" (Cook, 2014, p. 233). It is very difficult to replicate a study when participants' demographics are not included. This is problematic as replication is essential to scientific knowledge and the verification of evidence-based practices (Cook, 2014; Francis, 2012; Jasny, Chin, Chong, & Vignieri, 2011; Lehrer, 2010).

It is also important to recognize what may be lost by not including demographic information related to the study. Consider being an educator seeking ways to incorporate evidence-based strategies with their specific population. This educator may

be seeking ways to incorporate the diverse cultural and linguistic backgrounds of their students, and face difficulty in identifying research or practices that have intentionally sought to include individuals who “look like” their students and the families of their students. While we recognize that specific studies may not be available for every conceivable situation or context and that use of evidence-based practices does incorporate the use of professional judgment (West et al., 2013), practitioners certainly crave information about the contexts in which they teach (Greenway, McCollow, Hudson, Davis, & Peck, 2013). Including robust participant demographic information would be a step toward supporting practitioners who are expected to implement these evidence-based practices. It would also provide a means of highlighting potential gaps in research.

Future Research

There are many reasons researchers may not be conducting research of diverse populations of participants. For example, language could serve as a barrier with the cost of interpreters not always budgeted for in research. Thus, researchers might not include specific participants in research if they are not able to communicate proficiently (i.e., in English). Research should be conducted to further examine barriers to the inclusion of diverse populations of participants in research. Future research might also identify evidence-based practices with homogenous participants and study the same practices in other contexts and with varied participants. Of course, we understand the need to control variables to better understand the effects of treatments and interventions, however, without research conducted in different contexts and with more diverse participants, we cannot understand the ways in which practices might need to be adapted or modified to better fit contexts.

Conclusion

The ultimate responsibility for making research information on learners with disabilities interpretable for application or subsequent replication rests with the researcher. Our examination extends the research that reveals that participant demographics are underreported in educational disability studies. Journal editors can exercise their influence in assuring participant demographics by providing requirements to potential authors and reviewers. Institute of higher education and federal agencies can contribute by requiring demographics in coursework and for awarding of funding. The guidelines provided here are a call to action that should bring us closer to interpreting and integrating research into practice in applied settings but they must actually be implemented (Rosenberg et al., 1984). It is also a reflection on the ways in which research participants may be selected and included, or excluded. Selection of a special education evidence-based practice requires developing an understanding of what interventions work as well as for whom they are effective. The field of autism has made tremendous strides in identifying evidence based practices for practitioners to choose from to meet the needs of learners with autism through the National Autism Center’s National Standards Report (NAC, 2015; Wilczynski et al., 2009) and the National Professional Development Center on Autism Spectrum Disorders (Wong et al., 2014). We need to take another important step and ensure interventionists have practices to choose from that match the diverse demographics of individuals with autism they serve. We must start now to prepare evidence-based practices for our future majority-minority learners with disabilities by ensuring participant demographics are reported in our research studies. While each of us has heard the rebuttal that participant demographic

information is not vital for identifying evidence-based practices, we would like to respond: But how do we know? As we extend the literature on participant demographics,

we continue to seek “but for whom” is the research intended to support?

References

- American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author.
- Anthony, W., Rogers, E. S., & Farkas, M. (2003). Research on evidence-based practices: Future directions in an era of recovery. *Community Mental Health Journal, 39*, 101-114.
- Artiles, A. J., Trent, S. C., & Kuan, L. A. (1997). Learning disabilities empirical research on ethnic minority students: An analysis of 22 years of studies published in selected refereed journals. *Learning Disabilities Research & Practice, 12*, 82-91.
- Bernal, G., Jiménez-Chafey, M. I., & Domenech Rodríguez, M. M. (2009). Cultural adaptation of treatments: A resource for considering culture in evidence-based practice. *Professional Psychology: Research and Practice, 40*, 361.
- Colby, S. L., & Ortman, J. M. (2015). *Projections of the size and composition of the US population: 2014 to 2060. Population estimates and projections. Current Population Reports. P25-1143*. US Census Bureau.
- Cook, B. G. (2014). A call for examining replication and bias in special education research. *Remedial and Special Education, 35*, 233–246.
- Cook, B., Buysse, V., Klingner, J., Landrum, T., McWilliam, R., Tankersley, M., & Test, D. (2014). Council for Exceptional Children: Standards for evidence-based practices in special education. *Teaching Exceptional Children, 46*(6), 206-212.
- Cook, B. G., Tankersley, M., & Landrum, T. J. (2009). Determining evidence-based practices in special education. *Exceptional Children, 75*, 365-383.
- Dammann, J. E., & Vaughn, S. (2001). Science and sanity in special education. *Behavioral Disorders, 27*, 21–29.
- Dukes, C., & Lamar-Dukes, P. (2009). Diversity: What we know, what we need to know, and what we need to do. *Research and Practice for Persons with Severe Disabilities, 34*, 71-75.
- Engebretson, J., Mahoney, J., & Carlson, E. D. (2008). Cultural competence in the era of evidence-based practice. *Journal of Professional Nursing, 24*, 172-178.
- Francis, G. (2012). The psychology of replication and replication in psychology. *Perspectives on Psychological Science, 7*, 585–594. doi:10.1177/1745691612459520.
- Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C., & Innocenti, M. S. (2005). Quality indicators for group experimental and quasi-experimental research in special education. *Exceptional Children, 71*, 149-164.
- Greenway, R., McCollow, M., Hudson, R. F., Peck, C., & Davis, C. A. (2013). Autonomy and accountability: Teacher perspectives on evidence-based practice and decision-making for students with intellectual and developmental disabilities. *Education and Training in Autism and Developmental Disabilities, 48*, 456-468.
- Griswold, A. (2016, July). For children with autism, multiple languages may be a boon. Retrieved from: <https://www.spectrumnews.org/news/for-children-with-autism-multiple-languages-may-be-a-boon/>

- Hambly, C., & Fombonne, E. (2012). The impact of bilingual environments on language development in children with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 42*, 1342-1352.
- Hammill, D. D., Bryant, B. R., Brown, L., Dunn, C., & Marten, A. (1989). How replicable is current LD research? A follow-up to the CLD Research Committee's recommendations. *Learning Disability Quarterly, 12*, 174-179.
- 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*, 165-179.
- Jasny, B. R., Chin, G., Chong, L., & Vignieri, S. (2011). Again, and again, and again . . . *Science, 334*, 1225. doi:10.1126/science. 334.6060.1225.
- Kistner, J., & Robbins, F. (1986). Brief report: Characteristics of methods of subject selection and description in research on autism. *Journal of Autism and Developmental Disorders, 16*, 77-82.
- Lehrer, J. (2010). The truth wears off: Is there something wrong with the scientific method? *The New Yorker*. Retrieved from <http://www.newyorker.com/magazine/2010/12/13/the-truth-wears-off>.
- Lessen, E., Dudzinski, M., Karsh, K., & Van Acker, R. (1989). A survey of ten years of academic intervention research with learning disabled students: Implications for research and practice. *LD Focus, 4*, 106-122.
- López, I. F. H. (1994). The social construction of race: Some observations on illusion, fabrication, and choice. *Harvard Civil Rights-Civil Liberties Law Review, 29*, 1.
- McFarland, J., Hussar, B., Wang, X., Zhang, J., Wang, K., Rathbun, A., . . . Bullock Mann, F. (2018). *The Condition of Education 2018* (NCES 2018-144). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved [October 8, 2018] from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2018144>.
- Mulcahy, C. A., Krezmien, M. P., & Travers, J. (2016). Improving mathematics performance among secondary students with EBD: A methodological review. *Remedial and Special Education, 37*(2), 113-128.
- National Autism Center. (2015). Findings and conclusions: National standards project, phase 2. Randolph, MA: Author.
- Odom, S. L. (2009). The tie that binds evidence-based practice, implementation science, and outcomes for children. *Topics in Early Childhood Special Education, 29*, 53-61.
- Odom, S. L., Brantlinger, E., Gersten, R., Horner, R. H., Thompson, B., & Harris, K. R. (2005). Research in special education: Scientific methods and evidence-based practices. *Exceptional children, 71*, 137-148.
- Petersen, J. M., Marinova-Todd, S. H., & Mirenda, P. (2012). Brief report: An exploratory study of lexical skills in bilingual children with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 42*, 1499-1503.
- Pierce, N. P., O'Reilly, M. F., Sorrells, A. M., Fragale, C. L., White, P. J., Aguilar, J. M., & Cole, H. A. (2014). Ethnicity reporting practices for empirical research in three autism-related journals. *Journal of Autism and Developmental Disorders, 44*, 1507-1519.
- Rosenberg, M. S., Bott, D., Majsterek, D., Chiang, B., Simmons, D., Gartland, D., . . . Wilson, R. (1994). Minimum standards for the description of participants in learning disabilities research. *Remedial and Special Education, 15*, 56-59.

- Slavin, R. E. (2002). Evidence-based education policies: Transforming educational practice and research. *Educational Researcher*, 31, 15–21. doi:10.3102/0013189X031007015.
- U.S. Census Bureau (2017). *Race and ethnicity*. Retrieved from <https://www.census.gov/mso/www/training/pdf/race-ethnicity-onepager.pdf>.
- Vasquez III, E., Lopez, A., Straub, C., Powell, S., McKinney, T., Walker, Z., ... Bedesem, P. L. (2011). Empirical research on ethnic minority students: 1995–2009. *Learning Disabilities Research & Practice*, 26, 84-93.
- West, E. A., McCollow, M., Kidwell, J., Umbarger, G., & Cote, D. L. (2013). Current status of evidence-based practice for students with intellectual disability and autism spectrum disorders. *Education and Training in Autism and Developmental Disabilities*, 48, 443-455.
- West, E. A., Travers, J. C., Kemper, T. D., Liberty, L. M., Cote, D. L., McCollow, M. M., & Brusnahan, L. L. S. (2016). Racial and ethnic diversity of participants in research supporting evidence-based practices for learners with autism spectrum disorder. *The Journal of Special Education*, 50, 151-163. doi: 0022466916632495.
- Whaley, A. L., & Davis, K. E. (2007). Cultural competence and evidence-based practice in mental health services: a complementary perspective. *American Psychologist*, 62, 563.
- Wilczynski, S., Green, G., Ricciardi, J., Boyd, B., Hume, A., Ladd, M., & Rue, H. (2009). *National standards report: The national standards project: Addressing the need for evidence-based practice guidelines for autism spectrum disorders*. Randolph, MA: The National Autism Center.
- Wong, C., Odom, S. L., Hume, K. Cox, A. W., Fettig, A., Kucharczyk, S., ... Schultz, T. R. (2014). *Evidence-based practices for children, youth, and young adults with Autism Spectrum Disorder*. Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, Autism Evidence-Based Practice Review Group.
- Wong, C., Odom, S. L., Hume, K. A., Cox, A. W., Fettig, A., Kucharczyk, S., ... Schultz, T. R. (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder: A comprehensive review. *Journal of Autism and Developmental Disorders*, 45, 1951-1966.

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An Exploratory Study Using Participation Plans for Inclusive Social Studies Instruction

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Abstract: Limited research exists on teaching social studies content, including intervention research, in inclusive settings for students with intellectual and developmental disabilities. The purpose of this exploratory project was to evaluate the use of participation plans for supporting students with intellectual and developmental disabilities in inclusive high school social studies classrooms. The study addressed two questions: (1) To what extent can students with IDD learn prioritized social studies content and skills in inclusive secondary settings? and (2) How do participation plans support students in learning prioritized social studies content and skills in inclusive general education settings? A university research team supported a public high school staff to employ a single-case, multiple baseline design across prioritized skills (knowledge of content, vocabulary, and summarization) and participants. Results showed students' correct responses increased across prioritized skills after the team began using the participation plans. This discreet intervention exhibits promise for school staff (i.e., teachers, paraprofessionals) needing mediating tools for effective inclusive education.

There is an increased focus on educating students with intellectual and developmental disabilities (IDD) in inclusive general education settings due to converging policy guidelines and research-based evidence over the past several decades. Specifically, the Individuals with Disabilities Education Improvement Act (IDEA; 2004) and Every Student Succeeds Act (2015) focus on students learning general education curriculum, in the general education setting “to the maximum extent appropriate” (34 CFR §1401(29)). Moreover, IDEA requires schools provide students with disabilities “access to the general education curriculum... to learn grade-level content based on grade-level standards” (CFR. Part

34, 300.26 [b] [3] [ii]) whereby the state standards determine the core curriculum. Given the range of extensive learning support needs of students with IDD (Spooner, Knight, Browder, & Smith, 2012), and the requirement for students with IDD to access and show progress in grade aligned state standards, many schools have utilized separate special education settings to teach curricula loosely tied to state standards (Bacon, Rood, & Ferri, 2016). However, as Bacon and colleagues describe, such settings limit “access to the general education classroom [discourse], high expectations, and socialization with same-age peers” (2016, p. 8). In fact, core academic instruction in inclusive settings is recommended to achieve

desired student learning outcomes (Jackson, Ryndak, & Wehmeyer, 2008-2009).

Existing research has documented students with IDD can learn academic content and has described effective instructional methods for this population. Findings from comprehensive research reviews indicate students with IDD in grades K-12 can learn mathematics (e.g., Hudson, Rivera, & Grady, 2018) and literacy (e.g., Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006). The studies reviewed were overwhelmingly reflective of instruction in separate special education settings. In a comprehensive review of teaching academic skills to students with IDD, Spooner and colleagues (2012) identified time delay, task analytic instruction, and systematic prompting and feedback to be effective practices. Yet, the studies were delivered primarily in separate special education settings and by research teams rather than school staff (i.e., teachers, paraprofessionals), limiting generalizations of these instructional strategies to inclusive settings (Spooner et al., 2012).

Methods of providing instruction in core academic content for students with IDD are well documented (Spooner, Knight, Browder, Jimenez, & DiBiase, 2011). Three methods include embedded instruction, curricular modifications to support instruction of prioritized skills, and ecological assessment, as discussed next. We selected these methods due to their supporting evidence and our ability to embed them in existing classroom supports and routines. An organizing framework, which we call *participation plans*, incorporated these three methods. We designed the framework to assist school staff in providing adequate instructional trials on prioritized skills in the general education classroom and curricula.

The use of embedded instruction to teach academic skills to students with IDD in inclusive settings is an evidence-based practice (Jimenez & Kamei, 2015). Embedded instruction is explicit, systematic instruction that uses distributed instructional trials within the on-going routines and activities of the classroom environment (McDonnell, Johnson, & McQuivey, 2008). The use of embedded instruction to teach academic skills has resulted in positive gains for students with IDD in inclusive settings including vocabulary (e.g., Riesen, McDonnell, Johnson, Polychronis, & Jameson, 2003), sight words (e.g., Johnson & McDonnell, 2004), and academic facts (e.g., Collins, Evans, Creech-Galloway, Karl, & Miller 2007).

In addition to embedded instruction, the use of curricular supports and modifications is effective in promoting access to core curriculum and instruction for students with IDD. Students are more engaged in academic related activities when curricular modifications are provided (Lee, Wehmeyer, Soukup, & Palmer, 2010). Curricular modifications may alter what or how content is taught (Janney & Snell, 2006) and should be based on prioritized skills. Prioritized skills reflect a subset of general education learning outcomes targeted for instruction that afford students the opportunity to learn the most important student-specific general education content (Giangreco, Cloninger, & Iverson, 2011). Prioritized skills represent the “big ideas or key content in each [academic subject] ... that will support the student’s ability to achieve [their] life goals” (Hunt, McDonnell, & Crockett, 2012, p. 142). In making modifications based on prioritized skills, school staff provide a personally relevant curriculum for each student, thus enabling access to the general education curriculum with individualized supports (Trela & Jimenez, 2013).

Ecological assessment is a strategy used to examine all routines, including classroom routines, and determine what supports, if any, students need to fully participate in those routines (Haney & Cavallaro, 1996). Ecological assessment consists of developing a task analysis of classroom routines and observing student participation in those routines to determine if there is a discrepancy between expected and actual performance. When a discrepancy exists, school staff determine which supports (i.e., modified materials, communication supports) to provide within the routines and context of the general education classroom in order to minimize or eliminate the discrepancy. Ecological assessment is a person-centered approach for determining individualized supports for students with disabilities (Watson, Gable, & Greenwood, 2011).

While effective instructional strategies are well documented, there is limited empirical research focusing on teaching the full range of state-mandated curricular content to students with IDD. Limited K-12 social studies content research for students with IDD exists regardless of classroom setting and “is by far the most under-researched core content area. Little to no research has been conducted on effective strategies for use in teaching social studies content to this population of students” (Courtade, Jimenez, & Delano, 2014, p. 354). Yet social studies is required core content for high school students. In a 2013 investigation, Schenning, Knight, and Spooner (2013) taught adapted social studies content to three students with IDD, focusing on comprehension of adapted texts and application to real-world situations. Although the intervention related to state content standards, it took place in a separate special education setting. Similarly, Mims, Hudson, and Browder (2012) taught listening comprehension of historical biographies to four students with IDD. This intervention

resulted in high levels of correct responses for students; yet, the study occurred in a separate special education setting.

In consideration of the dearth of social studies research for students with IDD and the limited information on how school staff may provide successful inclusive core academic instruction, research is needed to develop effective social studies instructional practices for students with IDD in K-12 inclusive settings. The nuanced impact of interventions implemented by school staff, rather than research teams, is also needed. The purpose of this exploratory project was to evaluate the use of participation plans, consisting of embedded instruction and curricular adaptations based on ecological assessments, to teach social studies content to high school students with IDD in inclusive general education settings. The study addressed two questions: (1) To what extent can students with IDD learn prioritized social studies content and skills in inclusive secondary settings? and (2) How do participation plans support students in learning prioritized social studies content and skills in inclusive general education settings?

Method

Participants

Three male students, Li, Vishal, and Isaiah, with autism and intellectual disability participated in the study (see Table 1). Each student participant met the following criteria: (a) receive special education services, as determined by the presence of a current Individualized Education Program (IEP), (b) receive special education services on a general education high school campus, and (c) have a significant intellectual disability as determined by school psychological reports and special education eligibility designations. One student, Li, had complex communication needs, and used a speech generating device in addition to pointing and gesturing to

communicate. The other two students (Vishal and Isaiah) communicated verbally. Students spent between 40-54% of a typical school day in general education settings, and most of those courses were non-academic (e.g., physical education, art). The special education teacher completed a Likert-type rating scale ranging from 1 (no supports needed in an average week) to 4 (extraordinary supports needed, five or more times in an average day) to indicate the degree to which students needed supports (e.g., self-care, learning academic content, communication; Soukup, Wehmeyer, Bashinski, & Bovaird, 2007).

Two general education social studies teachers, one special education teacher, and two special education paraprofessionals participated in the study ($n = 5$). Teaching experience ranged from 4-22 years in their current role ($Mdn = 9$ years; see Table 1). Two paraprofessionals, Ms. Austin and Ms. Carmel, served as primary data collectors, independently collecting one probe (opportunity for a student to respond) for each prioritized skill per student during each school day. Paraprofessionals were the adults most familiar with supporting the student participants in the general education setting. Each received training in implementation of supports and data collection, described in greater detail in the Experimental Design and Procedures section.

Setting

All phases of the study occurred in general education high school social studies classes. Vishal and Li were enrolled in the same 12th grade Civics course, taught by Mr. Orlando and supported by Ms. Austin and Ms. Carmel. A total of 40 students enrolled in the course. At the time of this study, the Civics curriculum focused on the U.S. Constitution

and the three branches of government. Isaiah was enrolled in an 11th grade U.S. History course, taught by Mr. Houston and supported by Ms. Carmel, with 35 other students. At the time of this study, the U.S. History curriculum focused on the latter half of the 20th century. In all cases, a natural proportion of students with and without disabilities was present in the classroom. All student participants sat with their peers in small groups in the two general education classrooms.

Materials

Participation plans, an intervention package, were the primary materials developed and evaluated in this study. The participation plan is an intervention package consisting of three core components: embedded instruction, a system of least prompts, and individualized adaptations focused around student prioritized skills. To create individual participation plans, the general education teachers and special education staff determined prioritized skills for each student using the state standards and curriculum for social studies instruction (grade 11 or 12) and knowledge of student strengths, needs, and IEP goals. Prioritized skills included: vocabulary, summarization, and knowledge of course content (see Table 2) and were the first rows of information in each student's participation plan.

Opportunities to teach prioritized skills were identified within typical routines in the social studies classes, and individualized adaptations were created based on special education staff input and ecological assessment. Instruction, using adaptations as needed, was provided using a system of least prompts. This information (prioritized skills embedded in routines and individualized adaptations) was described in the instructional plan for each student.

Table 1. *Participant Demographic Information*

Student Demographic Information										
Pseudonym	Age	Grade	Ethnicity	Gender	Communication Method	% of time in General Education	Self-Care Support Rating	Learning Support Rating	Behavior Support Rating	Communication Support Rating
<i>Isaiah</i>	<i>16</i>	<i>10</i>	<i>Asian - Other</i>	<i>M</i>	<i>Verbal</i>	<i>51</i>	<i>1</i>	<i>2</i>	<i>2</i>	<i>3</i>
<i>Vishal</i>	<i>16</i>	<i>11</i>	<i>Asian – Indian</i>	<i>M</i>	<i>Verbal</i>	<i>54</i>	<i>1</i>	<i>2</i>	<i>2</i>	<i>4</i>
<i>Li</i>	<i>17</i>	<i>12</i>	<i>Asian – Chinese</i>	<i>M</i>	<i>Picture symbols; voice output device</i>	<i>40</i>	<i>3</i>	<i>4</i>	<i>4</i>	<i>4</i>
Instructor Demographic Information										
Pseudonym	Age	Current Role	Ethnicity	Teaching Certification(s)	Years in Current Role	Highest Degree	Caseload Size	Instructor Preparation for inclusion		
<i>Ms. Denver</i>	<i>36</i>	<i>SPED</i>	<i>White</i>	<i>Mild/Moderate SPED; Severe/Profound SPED</i>	<i>9</i>	<i>B.S.</i>	<i>11</i>	<i>Pre-Service</i>		
<i>Ms. Austin</i>	<i>29</i>	<i>Para</i>	<i>Pacific Islander</i>	<i>None</i>	<i>4</i>	<i>B.A.</i>	<i>9</i>	<i>In-Service</i>		
<i>Ms. Carmel</i>	<i>39</i>	<i>Para</i>	<i>White</i>	<i>None</i>	<i>12</i>	<i>A.A.</i>	<i>10</i>	<i>None</i>		
<i>Mr. Houston</i>	<i>34</i>	<i>GE</i>	<i>Black</i>	<i>Single Subject – Social Studies</i>	<i>9</i>	<i>M.Ed.</i>	<i>128</i>	<i>Master’s degree in multi-cultural education</i>		
<i>Mr. Orlando</i>	<i>56</i>	<i>GE</i>	<i>White</i>	<i>Single Subject – Social Studies</i>	<i>22</i>	<i>B.A.</i>	<i>120</i>	<i>In-Service</i>		

Note. SPED = Special education teacher; GE = General Education teacher; Para = Paraprofessional

Table 2. *Student prioritized learning skills*

Student	Prioritized Skill 1 (Vocabulary)	Prioritized Skill 2 (Summarization)	Prioritized Skill 3 (Knowledge)
Isaiah	Learn 10 vocabulary words for the unit (discrimination, protest, labor, ally, conflict, segregation, economics, grassroots, social change, patriotism)	Demonstrate understanding of content by correctly answering “who” and “what” questions about content covered in class	Use sentence stems to identify one thing learned that day in class, and one opinion about what was learned.
Vishal	Learn 10 vocabulary words for the unit (liberal, moderate, conservative, democrats, republicans, colonist, constitution, bill of rights)	Write a sentence to identify one thing learned in class that day and one opinion about the topic.	Explain the responsibilities of the President, Vice President, Executive Branch, Legislative Branch, and Judicial Branch.
Li	Learn six vocabulary words for the unit (constitution, conservative, liberal, democrat, republican, supreme court)	Demonstrate understanding of content by correctly answering “who” and “what” questions about content covered in class	Use iPad to construct sentence to demonstrate knowledge of President, Vice President, branches of government (executive, legislative, and judicial) and explain responsibilities of each branch

The participation plans consisted of 6 columns (see Table 3). The first column listed the schedule of general education classroom activities, as determined by the ecological assessment. The second column held space for skills to teach beyond IEP goals that matched the context of the activity. Columns 3 and 4 listed natural teaching and embedded instructional opportunities to teach prioritized skills. The university team defined natural teaching opportunities as already-occurring instruction. For example, if a student’s prioritized skill was to identify the three branches of government, and the class was discussing the judicial branch, then we considered this a natural learning opportunity. The university team defined embedded teaching opportunities as supplemental teaching opportunities. In the above example, if a student was learning the three branches of government, the school staff would create opportunities by embedding content into existing activities or

by simply asking a student to list the branches of government during independent work times when this was not a focus of the lesson that day. The final two columns described adaptations and supports for students to participate in each class activity. Global supports were supports available to all students (i.e., PowerPoint presentations, literacy materials, questions, graphic organizers, rubrics) and corresponded to classroom activities. The adaptations section described student-specific supports as they pertained to each classroom activity listed in the first column.

Experimental Design and Procedures

We used a multiple probe across participants design to evaluate the effects of the participation plan package on students’ learning of prioritized, individualized social studies content. This exploratory study consisted of five phases: pre-baseline, baseline, training, intervention, and

Table 3/ *Sample participation plan for Li*

Student Goal Summary:					
<ol style="list-style-type: none"> Li will learn six vocabulary words for the unit (constitution, conservative, liberal, democrat, republican, supreme court) Li will demonstrate understanding of content by correctly answering “who” and “what” questions about content covered in class Li will use an iPad to construct sentence to demonstrate knowledge of President, Vice President, branches of government (executive, legislative, and judicial) and explain responsibilities of each branch 					
Schedule of Activities	Skills to Teach (beyond goals)	Natural Teaching Opportunities (of goals)	Embedded Teaching Opportunities (of goals)	Global Supports	Individual Adaptations
Teacher lecture with power point	Note taking Attending to teacher	<u>Goal # 1</u>	<u>Goal # 1</u> – Embed vocabulary words into power point	Power point on screen	1. Visual reminder to look at teacher / screen
Group discussion / Questions	Raise hand to answer a question	<u>Goal# 2, 3</u>	<u>Goal # 3</u>	Teacher questions	1. iPad 2. Visual reminder to listen to peers 3.
Analyze primary sources – may be individual or small group	Communicate with group members	<u>Goal# 2, 3</u>	<u>Goal # 1, 2</u>	Highlighters Primary documents Assignment rubric	1. Supports (peer, visual, script, adult) 2. Graphic organizer 3. Paragraphs numbered (1, 2, 3) 4. Highlight key phrases or sentences in text 5. Adapt questions

maintenance.

Pre-baseline. Prior to beginning the baseline phase of the study, the university team No student or education team member behavioral data were collected during this process.

Baseline. Students received “business as

completed ecological assessments of the two social studies classes. The school staff used this information to determine prioritized skills and design participation plans. usual instruction” in baseline. In other words, students received adaptations and prompts, but did not receive embedded instruction of prioritized skills with skill-specific adaptations. For example, a student may have

had a worksheet modified with a word bank or added choices, but the modifications were not explicitly linked to the student's prioritized skills. A multi-tiered entry into intervention was provided, and students moved from baseline to intervention after demonstrating stable responses in three consecutive probes.

Training. In addition to conducting ecological assessments for each student in their social studies classrooms, the research team trained school staff to implement the intervention between baseline and intervention phases. One graduate student from the university team spent three days with the school staff to provide training on how to implement each participation plan. Training included discussing and modeling how to embed prioritized skill practice into class activities. The graduate student and school staff engaged in real-time problem solving to ensure implementation preparedness and fidelity. Participation plan implementation fidelity was ensured via observations of all students across classrooms, with fidelity measured at 100% across students for two (of three) prioritized skills for each student.

The research team also met with Ms. Denver, the special education teacher, and Ms. Austin and Ms. Carmel weekly for approximately 20 minutes via Zoom (2017) over the course of the 5-week training phase. In the training meetings, school staff received instruction on how to use data collection sheets, provide supports during distinct phases of the study, and collect inter-rater reliability data. We also clarified operational definitions of behaviors, scores for student responses, and strategies for maximizing embedded instruction.

Intervention and maintenance. During intervention, students received

individualized supports as specified in their individualized participation plans. All students received the complete intervention package (i.e., embedded instruction, system of least prompts, and adaptations focused on prioritized skills) during the intervention phase. Instructors provided one probe for each prioritized skill per class session during the intervention phase to the extent possible, considering class schedules and student absences. The intervention phase proceeded for at least 4 data points, or until stability had been achieved. School staff completed maintenance probes at least 8 school days after the intervention ended for each prioritized skill to determine retention of learned skills and in consideration of the anticipated length of social studies unit. The same conditions were applied in maintenance as the intervention phase.

Data Collection and Analysis

Data analysis included visual inspection of graphed data (Lane & Gast, 2014). Within condition analysis included trend direction and stability, along with relative level and stability (Horner et al., 2005). Prioritized skill probes were delivered typically by paraprofessionals in the general education classroom during non-invasive instructional times (embedded instruction). Instructional trials were provided at least once, but not more than twice per day. Data sheets included the prioritized skills and adaptations, as articulated in the participation plans. School staff scored: a '2' if the student responded correctly independently (e.g., selected correct vocabulary definition from a field of three, with no prompting); a '1' if the student required any prompt to respond correctly, using a system of least prompts; and a '0' if the student responded incorrectly (with or without prompting) or failed to respond. The sum for each skill was calculated as total points per day, along with total points possible per day as determined by the total

number of instructional trials provided. A percentage score (total points earned divided by total possible points possible multiplied by 100) was calculated and graphed for each student.

Procedural Fidelity and Inter-Observer Agreement

Procedural fidelity was measured using a task analysis of the steps in the participation plan. Due to the varied nature of class activities for each student, the steps needed to complete each student's participation plan also varied. Fidelity was assessed for both school staff implementation of each component of the participation plan. This fidelity data was collected both in-person (i.e., the university team observing within the classroom) and via video provided by the school staff. Procedural fidelity was computed by dividing the number of steps present in the participation plan by total number of steps planned and multiplying by 100. Procedural fidelity was assessed in-person (15% of instruction) and by video (2%), averaging 95% across participants (range: 90-98%). For all phases of the study, the second author entered all data into MS Excel for analysis, with each point of data entered confirmed by the first and third authors.

Inter-observer agreement (IOA) data was collected in baseline (20.04%), intervention (18.65%), and maintenance (44.94%) phases and each student by the paraprofessionals. During reliability, a second graduate student collected data on student performance using the same data collection sheets as the paraprofessionals. After each double coded reliability session, the university team compared both ratings and computed point-by-point IOA. The number of intervals in agreement was divided by the sum of the number of intervals in agreement and disagreement (total intervals), multiplied by 100 to obtain a percentage. Three consecutive

agreements $\geq 90\%$ was established as minimum criteria.

Social Validity

The university team collected school staff and student feedback on intervention feasibility and effectiveness via questionnaire. The staff questionnaire (adapted from Hudson, Browder, & Jimenez, 2014; Tarnowski & Simonian, 1992) targeted overall intervention effectiveness and specific intervention components, and outcomes of the participation plan package. Student feedback (adapted from Knight, Wood, Spooner, Browder, & O'Brien, 2015) was collected via the questionnaire. The form solicited information from the students, including their goals, what supports helped them learn, and what they enjoyed from the social studies class.

Results

Descriptive data were examined to evaluate the outcomes of the intervention on prioritized skills, social validity of the participation plans, and reliability of study data.

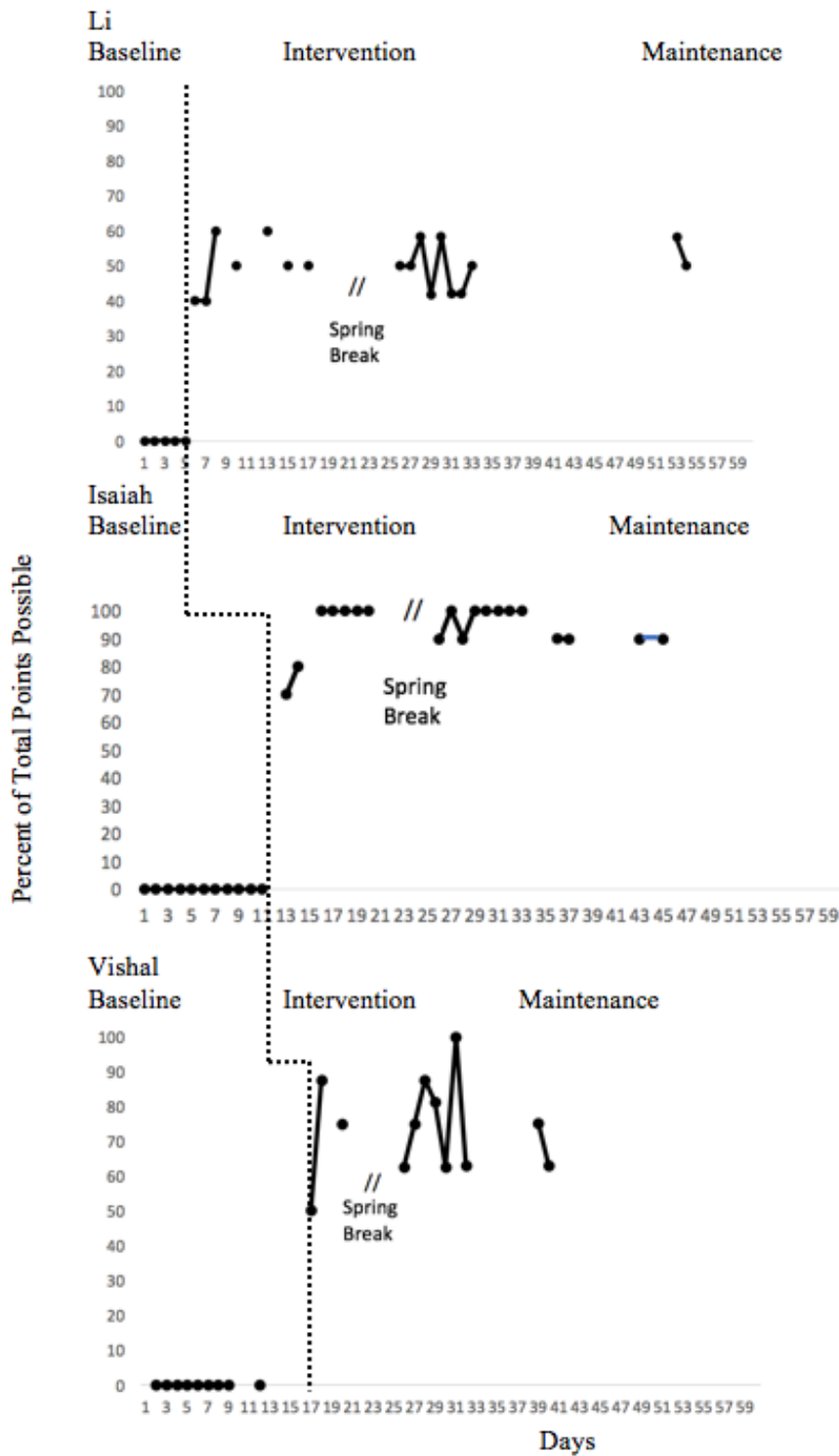
Prioritized Skills Outcomes

Vocabulary. Table 2 displays prioritized vocabulary skills. Figure 1 shows each student's scores for vocabulary skills.

Li. During baseline, Li's scores were low and stable, earning 0 possible points. His performance showed an immediate and abrupt change after introduction of the participation plan, with scores ranging from 40 to 60% of possible points (*Mdn* =50%). There was no change in relative level during intervention. Two maintenance sessions were completed over 1 week. Scores during this period range from 50 to 58% (*Mdn* =40%).

Isaiah. During baseline, Isaiah's scores on the vocabulary skill were low and stable, at

Figure 1. *Prioritized skill 1 - Vocabulary*



Note. Vishal and Li are receiving instruction in Civics; Isaiah’s instruction was in U.S. History.

0% (*Mdn* =0%). His performance showed an immediate and abrupt change after introduction of the participation plan, with scores ranging from 70 to 100% (*Mdn* =100%). Isaiah had no change in relative level during intervention. Two maintenance sessions were completed over 1 week. Isaiah's scores during maintenance remained high at 90%.

Vishal. During baseline, Vishal's scores were low and stable, earning 0 possible points during each probe (*Mdn* =0%). Baseline data was not completed immediately prior to intervention due to unexpected scheduling issues and considerations related to the impending end of the school year. However, Vishal's performance showed an immediate and abrupt change after introduction of the participation plan, with scores ranging from 50 to 100% of possible points (*Mdn* =75%). There was slight improvement in relative level during intervention. Two maintenance sessions were completed. Vishal's scores ranged from 63 to 75% (*Mdn* =69).

Summarization. Table 2 lists prioritized summarization skills. Figure 2 shows student scores for summarization skills.

Isaiah. During baseline, Isaiah's scores on the summarization skill were low and stable (*Mdn* =0%). His performance showed an immediate change after introduction of the participation plan, with scores ranging from 0 to 100% (*Mdn* =62.5%). There was an improvement in relative level during intervention. Two maintenance sessions were completed over 1 week. Isaiah's scores during this period remained high at 100%.

Vishal. During baseline, Vishal's scores were low and unstable, ranging from 0 to 50% possible points (*Mdn* =0%). His performance showed an immediate and abrupt change after introduction of the participation plan,

with scores ranging from 50 to 100% (*Mdn* =75%). A total of two maintenance sessions were completed over 2 weeks. Vishal's scores were high at 100%.

Li. During baseline, Li's scores were low and stable (*Mdn* =0%). His performance showed a change in level and trend after introduction of the participation plan, with scores ranging from 25 to 75% (*Mdn* =50%). There was a deteriorating change in relative level. Two maintenance sessions were completed over 2 weeks and Li's scores remained high, at 50%.

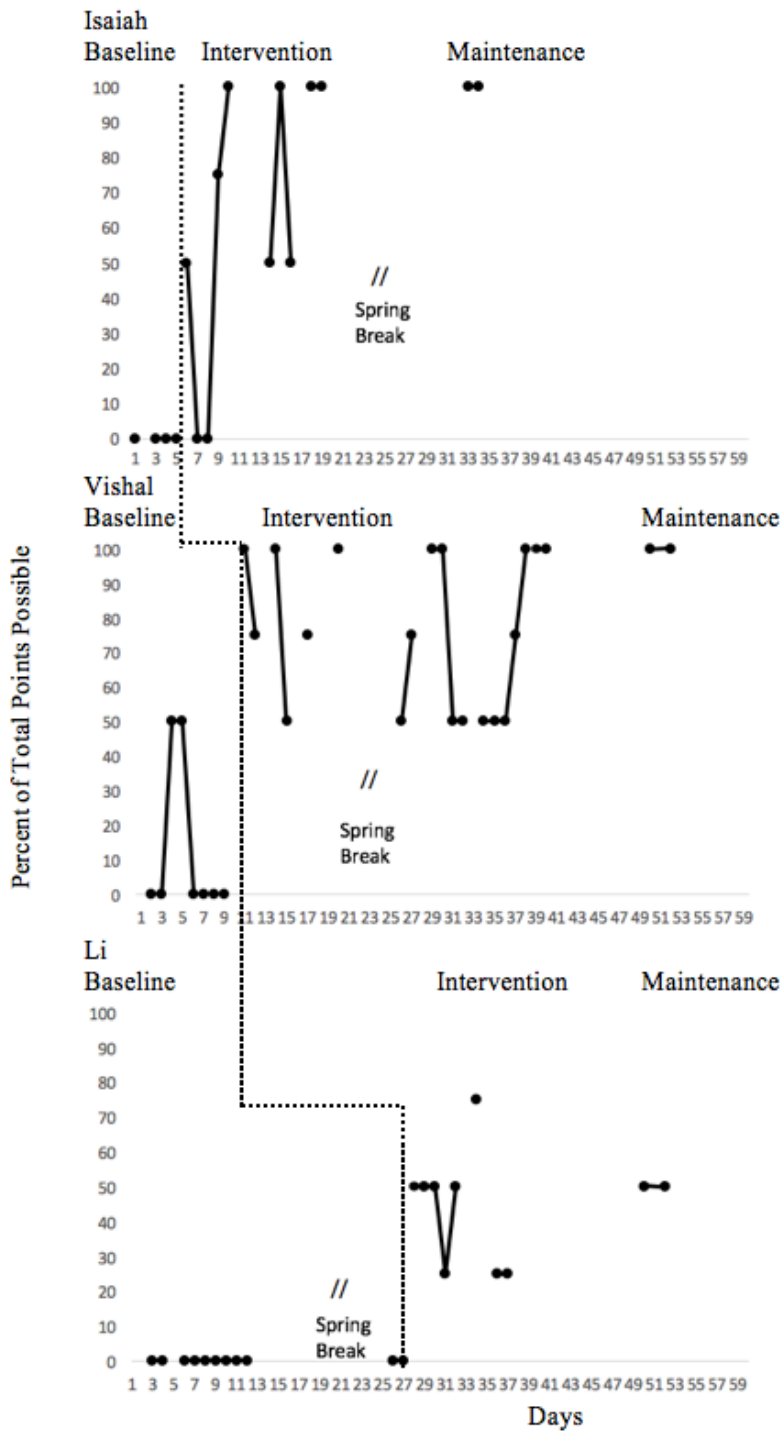
Knowledge. See Table 2 for student-specific prioritized knowledge skills and Figure 3 for knowledge skill instruction results.

Isaiah. During baseline, Isaiah's scores on the knowledge skill were low and stable (*Mdn* =0%). His performance showed an immediate and abrupt change after introduction of the participation plan, with scores ranging from 50 to 100% (*Mdn* =100%). There was no change in relative level. A total of four maintenance sessions were completed over 2 weeks. Isaiah's scores during this period were variable, ranging from 50 to 100% (*Mdn* =100%).

Li. During baseline, Li's scores were low and stable (*Mdn* = 0%). His performance immediately improved following introduction of the participation plan, with scores ranging from 30 to 60% (*Mdn* = 50%). There was an improving trend in relative level during intervention. Two maintenance sessions were completed over 2 weeks, with scores at 50%.

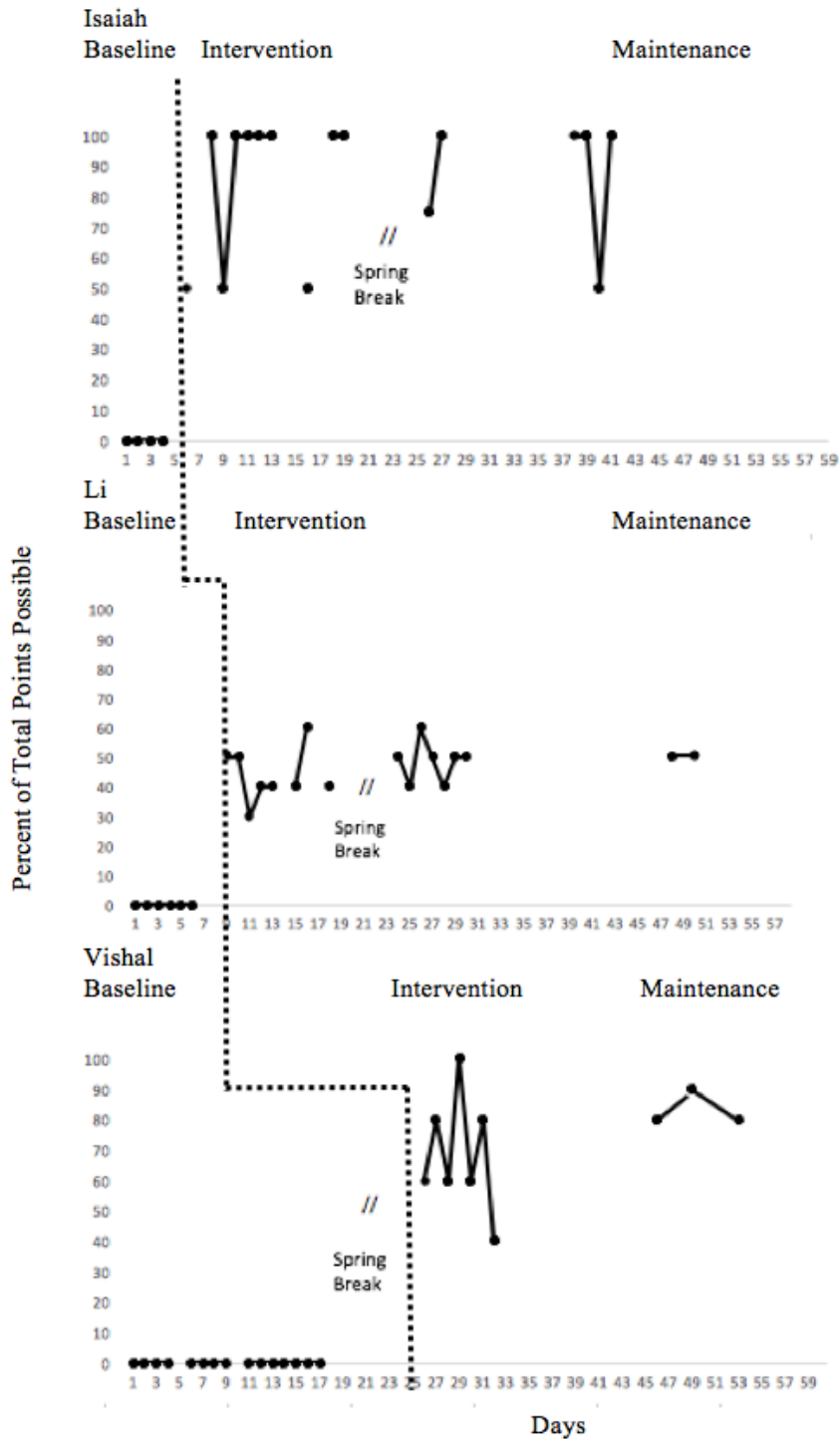
Vishal. During baseline, Vishal's scores were low and stable at 0%. His performance showed an improvement in trend after introduction of the participation plan, with scores ranging from 40 to 100% (*Mdn* = 60%). There was no change in relative level.

Figure 2. *Prioritized skill 2 - Summarization.*



Note. Vishal and Li are receiving instruction in Civics; Isaiah's instruction was in U.S. History.

Figure 3. Prioritized skill 3 - Knowledge.



Note. Vishal and Li are receiving instruction in Civics; Isaiah's instruction was in U.S. History.

A total of three maintenance sessions were completed over 3 weeks; his scores ranged from 80 to 90% (*Mdn* = 80%).

Reliability and Social Validity

Reliability was established by two raters in 20.63% of sessions. This included 20% of the baseline sessions with 100% agreement, in 18.7% of intervention sessions with 93.46% agreement, and 44.9% of maintenance sessions with 100% agreement. Social validity was assessed by surveying all school participants (see Table 4). Four of the five school staff completed the social validity assessment, with positive responses to the intervention. The most critical rating ($M = 5.25$) was related to time to implement the intervention. The highest ratings were related to impact on student and school staff willingness to teach other students with IDD in general education settings. One participant noted the intervention “helped [the] team focus on academic-based interventions... [and] increased our conversations.” Student social validity reports indicated positive responses to the intervention; students identified pictures, partners/groups, and definitions as learning supports. Some of the activities they enjoyed included giving presentations, writing reports, and reading news articles. All three students reported meeting their goal for the class.

Discussion

The purpose of the current exploratory study was to evaluate the feasibility and effectiveness of participation plans for teaching social studies content to students with IDD in inclusive settings. While all three students increased their correct responses for all three prioritized skills after the participation plan was introduced, obtaining consecutive data points in all phases was not possible due to time restrictions. Further, our time-limited assessment of student maintenance

demonstrated only preliminary evidence that students maintained their skills over time. Yet, the intervention was minimally invasive, occurred in inclusive general education settings in typical instructional conditions, and did not require expensive or time-consuming supports. Together, there is preliminary evidence to support the use of participation plans to facilitate student learning of prioritized skills in inclusive settings.

The university team measured feasibility through fidelity and social validity measures. In all conditions and for all students, fidelity of implementation was high. Overall, stakeholders (staff and students) were satisfied with the intervention. School staff responses indicated the intervention was effective and reasonable, even in realistic schooling conditions. Students identified several supports they found useful for learning social studies content.

The university team measured effectiveness through visual inspection of the graphed data. Results from this study indicated a possible functional relationship between the use of participation plans and student acquisition of prioritized social studies skills. Examination of the graphs for each participating student revealed students acquired vocabulary, summarization, and knowledge skills in the general education setting. While all three students demonstrated improved learning with maintenance of skills, Li’s achievement of all three goals was substantially lower than the other participants. Because Li was the only student with complex communication needs, the findings demonstrate the importance of targeted and intensive supports in inclusive settings for students with significant support needs. It is possible that additional supports, not provided in this study, would have enabled Li to progress to higher proficiency rates. Together, however,

Table 4. *Social validity rating scale scores*

School Staff Responses			
Question	Rating		Range
	M		
Students with ASD can learn academic content in the general education classroom	5.75		5-6
This was an acceptable intervention for the student's learning needs.	5.5		4-6
The intervention was effective in supporting the student's learning.	5.5		4-6
The student's learning needs are severe enough to justify the use of this intervention.	5.75		5-6
Overall, the intervention helped the student learn.	5.75		5-6
This intervention would not have bad side effects for the student.	6		N/A
I liked this intervention.	5.75		5-6
Following this experience, I will agree to teach other students with ASD in general education in the future.	6		N/A
I will recommend including students with ASD in general education classrooms to other teachers.	5.75		5-6
The demands on my time related to including students with ASD, as part of this intervention, were reasonable.	5.25		4-6
I have the skills and knowledge to include students with ASD in general education settings	5.75		5-6
I will use adapted materials, including participation plans and curricular modifications, again.	5.67		5-6
The use of adapted formative assessments was accurate and fair for use with students with ASD.	5.67		5-6
Student Responses			
Question	Isaiah	Vishal	Li
What things helped you learn in this class?	Pictures, partners/groups, definitions	Pictures, partners, definitions	Pictures
What things did you like doing in this class?	Presentations (Google slides), activities (dancing)	* The words (definitions [with] pictures) * True/False * Writing (documents)	Videos, news articles
What was your goal for this class?	My goal was to learn about history.	My goal is trying to learn.	Learn new things about civics.
Did you reach your goal?	Yes, I learned about history World War II.	I reached my goal.	Yes.

Note. 1 = Strongly Disagree; 2 = Disagree; 3 = Slightly Disagree; 4 = Slightly Agree; 5 = Agree; 6 = Strongly Agree. All student participant responses are recorded verbatim.

results demonstrated inclusive social studies instruction was both feasible and effective for students with IDD and the school staff.

Little research has been completed on the acquisition of social studies content as well as academic instruction exclusively in

general education settings for students with IDD. To address these gaps, the present study identified effective practices related to inclusive academic instruction and combined those practices into a single organizational framework referred to as a participation plan.

Specifically, the participation plans combined embedded instruction and curricular adaptations based on ecological assessment to teach prioritized skills to students with IDD. The university team taught the school staff how to use the participation plans to provide adequate instructional opportunities for students to learn prioritized skills and needed supports in inclusive general education settings. As such, the present study builds on the ecological curricular framework articulated by Hunt and colleagues (2012) which recommends developing standards-based academic goals that reflect individual student needs and priorities. Through use of these practices, all team members collaboratively determined how accessing social studies content can correlate with an individual student's quality of life goals (Schenning et al., 2013).

Limitations

The team identified limitations that impacted interpretability and generalization of the findings. First, the research was conducted in a natural school setting that often afforded irregular schedules or events, consequently, data was not collected on consecutive school days in all instances as intended in the study design. Second, additional constraints, including the school's trimester system, impending end of school year, and designated testing days, further impacted study design. As a result, we were not able to obtain consecutive data points prior to change in phase for all students in all skills or additional IOA data. Third, generalization probes were not collected because the participating students were not presently enrolled in other general education courses in which a participation plan could be implemented. Finally, participation plans consisted of embedded instruction and adapted materials. It is possible that our results were due to one of the two major components rather than a combination.

Implications for Research and Practice

Future research can expand the use of participation plans across supports and structures. For instance, additional research is needed to examine the effectiveness of participation plans coupled with peer supports. In the current study, participants primarily received supports from paraprofessionals, yet peer supports are an effective way to promote social and academic engagement for students with IDD in inclusive settings (Carter, 2017). Further, future research should expand the use of participation plans by pairing them with collaborative teaching arrangements for special and general education teachers.

Future research should include a larger sample size and occur in other social studies classrooms as well as additional high school content areas (i.e., science, mathematics, language arts). Future research should couple participation plans with visual aids (Schenning et al., 2013) or adapted texts and videos (Evmenova, Graff, & Behrmann, 2017; Knight et al., 2015). Finally, replicability needs to occur in inclusive elementary and middle school settings, focused on students with IDD, and expanded across content areas.

The use of participation plans to support student access and engagement in general education settings is a feasible and effective practice but requires time commitments from all stakeholders. Like many schools, the school staff in this study had no designated common planning time (Santoli, Sachs, Romey, & McClurg, 2008). Because development of curricular adaptations can be a time-consuming process (Kurth & Keegan, 2014), the usefulness of participation plans as a time-saving strategy is a promising practice. Relatedly, structures to support family participation in developing prioritized skills should be considered. Inclusive

education affords many opportunities for students with IDD to work on skills that may not be actualized as IEP goals, such as working in collaborative groups or learning core content. Thus, partnering with families to review general education content maps and align instruction with family priorities and interests would be beneficial to students and further support family-school connections. Finally, this study demonstrated the effectiveness of inclusive social studies instruction for students with IDD using participation plans. Currently, most students with IDD are removed from general education settings for academic instruction.

The findings from this exploratory study show removal from general education is not warranted to afford students opportunities to make progress on prioritized skills. When viewed within the context of other studies demonstrating that students learn academic content in inclusive settings (e.g., Ruppard, Afacan, Yang, & Pickett, 2017), along with concerns related to inequitable education in separate special education settings (e.g., Artiles, Kozleski, Dorn, & Christensen, 2006), these findings underscore the effectiveness and feasibility of inclusive academic instruction for students with IDD.

References

- Artiles, A., Kozleski, E., Dorn, S., & Christensen, C. (2006). Learning in inclusive education research: Re-mediating theory and methods with a transformative agenda. *Review of Research in Education, 30*, 65-108.
- Bacon, J., Rood, C. E., & Ferri, B. A. (2016). Promoting access through segregation: The emergence of the "prioritized curriculum" class. *Teachers College Record, 118*, 1-22.
- Browder, D., Wakeman, S., Spooner, F., Ahlgrim-Delzell, L., & Algozzine, B. (2006). Research on reading instruction for individuals with significant cognitive disabilities. *Exceptional Children, 72*, 392-408. doi:10.1177/001440290607200401
- Carter, E. W. (2017). The promise and practice of peer support arrangements for students with intellectual and developmental disabilities. *International Review of Research in Developmental Disabilities*. doi:10.1016/bs.irrdd.2017.04.001
- Collins, B. C., Evans, A., Creech-Galloway, C., Karl, J., & Miller, A. (2007). Comparison of the acquisition and maintenance of teaching functional and core content sight words in special and general education settings. *Focus on Autism & Other Developmental Disabilities, 22*, 220-233. doi:10.1177/10883576070220040401
- Courtade, G., Jimenez, B. A., & Delano, M. (2014). Providing effective instruction in core content areas (literacy, mathematics, science, and social studies) in inclusive schools. In J. McLeskey, N. L. Waldron, F. Spooner, & B. Algozzine (Eds.), *Handbook of effective inclusive schools: Research and practice* (pp. 352-362). New York, NY: Routledge.
- Every Student Succeeds Act, § P.L. 114-95 (2015).
- Evmenova, A. S., Graff, H. J., & Behrmann, M. M. (2017). Providing access to academic content for high-school students with significant intellectual disability through interactive videos. *Focus on Autism and Other Developmental Disabilities, 32*, 18-30. doi:10.1177/1088357615609307
- Gast, D. L. & Ledford, J. R. (Eds). (2014). *Single case research methodology: Applications in special education and behavioral sciences* (2nd Ed). New York, NY: Routledge.
- Giangreco, M., Cloninger, C. J., & Iverson, V. S. (2011). *Choosing Outcomes and accommodations for children* (3rd ed.). Baltimore, MD: Paul H. Brookes.

- Haney, M., & Cavallaro, C. (1996). Using ecological assessment in daily program planning for children with disabilities in typical preschool settings. *Topics in Early Childhood Special Education, 16*, 66-81. doi:10.1177/027112149601600107
- 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*, 165-179. doi:10.1177/001440290507100203
- Hudson, M. E., Browder, D., & Jimenez, B. A. (2014). Effects of a peer-delivered system of least prompts intervention and adapted science read-alouds on listening comprehension for participants with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities, 49*, 60-77.
- Hudson, M. E., Rivera, C. J., & Grady, M. M. (2018). Research on mathematics instruction with students with significant cognitive disabilities: Has anything changed? *Research and Practice for Persons with Severe Disabilities, 43*, 38-53. doi:10.1177/1540796918756601
- Hunt, P., McDonnell, J., & Crockett, M. A. (2012). Reconciling an ecological curricular framework focusing on quality of life outcomes with the development and instruction of standards-based academic goals. *Research and Practice for Persons with Severe Disabilities, 37*, 139-152. doi:10.2511/027494812804153471
- Individuals with Disabilities Education Improvement Act, 20 U.S.C. § 1412, (2004).
- Jackson, L., Ryndak, D. L., & Wehmeyer, M. L. (2008-2009). The dynamic relationship between context, curriculum, and student learning: A case for inclusive education as a research-based practice. *Research and Practice for Persons with Severe Disabilities, 33-4*, 175-195. doi:10.2511/rpsd.33.4.175
- Janney, R., & Snell, M. (2006). Modifying schoolwork in inclusive classrooms. *Theory into Practice, 45*, 215-223. doi:10.1207/s15430421tip4503_3
- Jimenez, B. A., & Kamei, A. (2015). Embedded instruction: An evaluation of evidence to inform inclusive practice. *Inclusion, 3*, 132-144. doi:10.1352/2326-6988-3.3.132
- Johnson, J. W., & McDonnell, J. (2004). An exploratory study of the implementation of embedded instruction by general educators with students with developmental disabilities. *Education and Treatment of Children, 27*, 46-63.
- Knight, V. F., Wood, C. L., Spooner, F., Browder, D., & O'Brien, C. P. (2015). An exploratory study using science eTexts with students with autism spectrum disorder. *Focus on Autism and Other Developmental Disabilities, 30*, 86-99. doi:10.1177/1088357614559214
- Kurth, J. A., & Keegan, L. (2014). Development and use of curricular adaptations for students receiving special education services. *Journal of Special Education, 48*, 191-203. doi:10.1177/0022466912464782
- Lane, J. D., & Gast, D. (2014). Visual analysis in single case experimental design studies: Brief review and guidelines. *Neuropsychological Rehabilitation, 24*, 445-463. doi:10.1080/09602011.2013.815636
- Lee, S. H., Wehmeyer, M. L., Soukup, J. H., & Palmer, S. B. (2010). Impact of curriculum modifications on access to the general education curriculum for students with disabilities. *Exceptional Children, 76*, 213-233. doi:10.1177/001440291007600205
- McDonnell, J., Johnson, J. W., & McQuivey, C. (2008). *Embedded instruction for students with developmental disabilities in general education classrooms*. Arlington, VA: Council for Exceptional Children, Division on Developmental Disabilities.

- Mims, P. J., Hudson, M. E., & Browder, D. M. (2012). Using read-alouds of grade-level biographies and systematic prompting to promote comprehension for students with moderate and severe developmental disabilities. *Focus on Autism and Other Developmental Disabilities, 27*, 67-80. doi:10.1177/1088357612446859
- Riesen, T., McDonnell, J., Johnson, J. W., Polychronis, S., & Jameson, M. (2003). A comparison of constant time delay and simultaneous prompting within embedded instruction in general education classes with students with moderate to severe disabilities. *Journal of Behavioral Education, 12*, 241-259. doi: 10.1177/0271121408316046
- Ruppar, A. L., Afacan, K., Yang, Y.-L., & Pickett, K. J. (2017). Embedded shared reading to increase literacy in an inclusive english/language arts class: Preliminary efficacy and ecological validity. *Education and Training in Autism and Developmental Disabilities, 52*, 51-63.
- Santoli, S. P., Sachs, J., Romey, E. A., & McClurg, S. (2008). A successful formula for middle school inclusion: Collaboration, time, and administrative support. *RMLE Online: Research in Middle Level Education, 32*, 1-13. doi: 10.1080/19404476.2008.11462055
- Schenning, H., Knight, V., & Spooner, F. (2013). Effects of structured inquiry and graphic organizers on social studies comprehension by students with autism spectrum disorders. *Research in Autism Spectrum Disorders, 7*, 526-540. doi: 10.1016/j.rasd.2012.12.007
- Soukup, J. H., Wehmeyer, M. L., Bashinski, S. M., & Bovaird, J. A. (2007). Classroom variables and access to the general curriculum for students with disabilities. *Exceptional Children, 74*, 101-120. doi:10.1177/001440290707400106
- Spooner, F., Knight, V., Browder, D., Jimenez, B., & DiBiase, W. (2011). Evaluating evidence-based practice in teaching science content to students with severe developmental disabilities. *Research and Practice for Persons with Severe Disabilities, 36*(1-2), 62-75.
- Spooner, F., Knight, V. F., Browder, D., & Smith, B. (2012). Evidence-based practices for teaching academics to students with severe developmental disabilities. *Remedial and Special Education, 33*, 374-387. doi: 10.1177/0741932511421634
- Tarnowski, K. J., & Simonian, S. J. (1992). Assessment treatment acceptance: The abbreviated acceptability rating profile. *Journal of Behavior Therapy and Experimental Psychiatry, 23*, 101-106. doi: 10.1016/0005-7916(92)90007-6
- Trela, K., & Jimenez, B. (2013). From different to differentiated: Using "ecological framework" to support personally relevant access to general curriculum for students with significant intellectual disabilities. *Research and Practice for Persons with Severe Disabilities, 38*, 117-119. doi: 10.2511/027494813807714537
- Watson, S. M. R., Gable, R., & Greenwood, C. R. (2011). Combining ecobehavioral assessment, functional assessment, and response to intervention to promote more effective classroom instruction. *Remedial & Special Education, 32*, 334-344. doi: 10.1177/0741932510362219
- Zoom. (2018). *Collaborative web based application for video and web conferencing*. San Jose, CA: Zoom Video Communications, Inc. Retrieved from www.zoom.us

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