

JAASEP

JOURNAL OF THE
AMERICAN ACADEMY *of*
SPECIAL EDUCATION
PROFESSIONALS



SPRING/SUMMER
2019

ISSN 2325-7466 (Online)



**JOURNAL of the
AMERICAN ACADEMY
of
SPECIAL EDUCATION PROFESSIONALS
(JAASEP)
Spring, 2019**

Volume 14, Issue 2

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Use of Projective Techniques in Emotional Disturbance Evaluations

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Abstract

Determining eligibility for the special education category Emotional Disturbance (ED) is a challenging task. The difficulty in identifying students with ED is due, in part, to problematic federal criteria (Olympia et al., 2004; Skiba, Grizzle, & Minke, 1994). Unchanges since 1975, these criteria have created an environment in which inconsistent assessment practices and diagnostic decisions are inevitable. The current study examines school psychologists' ED assessment practices, and in particular, the use of projective assessment techniques in eligibility determinations. The results suggest that school psychologists regularly use these controversial diagnostic techniques despite questions regarding their psychometric soundness (i.e., reliability and validity) and utility. Among the projective measures reported, those with the most limited empirical support (e.g., H-T-P, KFDS) were most widely used.

Use of Projective Techniques in Emotional Disturbance Evaluations

Over forty years since the category of Emotional Disturbance (ED) was first conceptualized within P.L. 94-142, the federal ED guidelines remain unchanged by legislators and heavily criticized by professionals (Merrell & Walker, 2004). Much of the scrutiny has been directed toward the original ED definition and eligibility criteria, which has been described by experts as vague, poorly defined, and professionally indefensible (e.g., Skiba, Grizzle, & Minke, 1994). A lack of clear federal guidelines and the failure to periodically update the eligibility criteria comes at the expense of the students for whom the federal law was intended to protect. Conservative estimates place the number of students in need of ED services at 3-6% (Merrell, 2008), yet less than 1% of all students in the United States are being served under the ED classification (U.S. Department of Education, 2007). Others estimate that as many as 80% of students with diagnosable emotional disturbances are not being identified and served under IDEA (Bazelon Center for Mental Health Law, 2003).

The ambiguity of the ED definition and its accompanying eligibility criteria makes identifying students who are entitled to special education services a challenging task. In fact, Forness and Kavale (2000) assert that “of several challenges that continue to face special education regarding children with emotional and behavioral disorders, the problem of eligibility is among the most pressing” (p. 267). The terminology contained in the ED definition has been widely assailed in many professional circles and invites subjective decision-making and inconsistent application on the part of the practitioner. Yet, even after several decades of persistent criticism and calls for revision, the federal eligibility criteria for ED remains unchanged.

The lack of clear federal guidelines has significant implications for school psychologists and other members of IDEA-required multidisciplinary assessment teams. This is particularly true for the selection of methods and procedures utilized by those involved in the direct of assessment of students for whom ED is a diagnostic consideration. Indeed, recent findings suggest the implementation of existing criteria results in subjective and inconsistent assessment practices among school psychologists.

Recently, Hanchon and Allen (2013) surveyed a group of school psychologists to examine the data collection techniques and assessment tools they used within the context of initial ED eligibility determination. Their results revealed that, in many instances, commonly recommended sources of data that should help to inform eligibility decisions (e.g., classroom observations, parent and teacher interviews, student interviews) were not routinely included in practitioners' evaluations. Moreover, in a follow up study Allen and Hanchon (2013) found that school psychologists frequently relied on only select sources of data (e.g., behavior ratings scales) to inform initial eligibility decisions rather than consistently employing comprehensive, multidimensional assessments that reflect broadly accepted "best practice" in psychoeducational assessment.

The ambiguous and vague diagnostic criteria permit individual biases or motivations, whether intentional or unintentional, to influence assessment planning and eligibility determinations. The problematic federal ED definition and resulting inconsistent assessment practices employed by school psychologists likely contributes to disproportionate placement rates among racial minorities (Wagner et al., 2005) and students from lower socioeconomic status and single parent homes (Losen & Orfield, 2002; Wagner et al., 2005).

The lack of clear federal guidelines has serious implications for school psychologists who are frequently tasked with both planning and conducting ED evaluations. Far too often, commonly recommended sources of data (e.g., classroom observations, parent and teacher interviews, student interviews) are not included in evaluations, while other techniques with limited empirical support are routinely used. The focus of the current study is on one such technique with a history of very limited research and psychometric evidence, the projective assessment of personality and behavior in children (e.g., House-Tree-Person, Kinetic Family Drawing, TAT/CAT).

Projective Assessment Techniques

Projective assessment of personality and behavior variables is based on the belief that individuals subconsciously reveal themselves through responses to ambiguous tasks, such as verbal free association, drawing tests, inkblot tests, and thematic picture/storytelling cards (Merrell, 1999). The notion of projective assessment is rooted in the psychodynamic approach to psychological assessment, which asserts that unconscious needs, drives, and desires are revealed through these techniques. Merrell (1999) draws a distinction between this clearly "projective" approach and other alternative approaches, which interpret test-takers' responses to these tasks as "direct statements of who they are as a person" (p. 180). As an example, Merrell provides a description of an individual's human figure drawing as a direct statement of his/her body image. An approach such as this offers an alternative framework to traditional "projective" methods, yet it still requires a potentially uncomfortable level of interpretive inference and speculation on the part of the psychologist.

Although the use of projective techniques is controversial and critiques questioning the validity of the approaches abound (Garb, Wood, Lilienfeld, & Nezworski, 2002; Merrell,

1999; Miller & Nickerson, 2006), they remain very popular assessment tools among clinical psychologists (Wilson & Reschly, 1996), licensed counselors (Peterson, 2014), and school psychologists (Hojnoski, Morrison, Brown, & Matthews, 2006). Among school psychologists, the most commonly used projective techniques are the House-Tree-Person, Kinetic Family Drawing System, TAT/CAT, and the Bender Gestalt Test (Hojnoski et al., 2006). Furthermore, these questionable techniques appear to be used at a higher rate with some of our most vulnerable populations of students, minority and English language learners (Ochoa, Riccio, Jimenez, de Alba, & Sines, 2004).

House-Tree-Person. The House-Tree-Person (H-T-P) technique is designed “to provide psychologists and psychiatrists...with an examining procedure with which to acquire diagnostically and prognostically significant data concerning a subject’s total personality and the interaction of that personality with its environment” (Buck, 1964). The projective technique uses three drawings (i.e., house, tree, and person) that purportedly allow the examiner to gain a picture of the subject’s personality. Proponents suggest that the house drawings signify the inner feelings of home life and family relationships, the tree drawings manifest as the deep, unconscious parts of the subject’s personality, and the drawing of the human is associated with the subject’s beliefs about themselves or their desire of who they wish to be (Wenck, 1970).

The H-T-P technique is separated into two phases that include, in total, four steps for implementing the assessment (Buck, 1964). The first phase is non-verbal and involves the actual drawing of the items; the second phase is verbal as the subject is asked to elaborate on his/her drawings. According to advocates of the technique, the examiner may wish to further probe the subject to learn more about the subconscious personality of the subject.

Interpretation of the H-T-P is based on examining the drawings for specific characteristics or “indicators”. From a variety of guides (most are two or three decades old and have not been updated), the psychologist ascertains the meaning of each indicator. For example, if a subject omits a chimney in his/her house drawing, one such guide (Ogdon, 1977) suggests a lack of psychological warmth in the home (in addition to other high inference interpretations). Most of these interpretive guides are replete with sexually-themed statements and judgments (Ogdon, 1977; Wenck, 1970). One author suggests that a male who draws a cane may have homosexual tendencies and purports that a drawing with an emphasized nose means “phallic preoccupation and/or castration fears, sexual inadequacy with compensatory feelings, or possible homosexual tendencies” (Wenck, 1970, p. 88).

Kinetic Family Drawing. According to Knoff & Prout (1985), the Kinetic Family Drawing System (KFDS) seeks to unlock the inner feelings of a child about his/her family dynamics, as well as to assess characteristics of their personality and psychological status. This instrument is similar to the House-Tree-Person whereas the child is asked to draw pictures; however, the child is specifically asked to draw the family members being active. After the child draws, the examiner enters the inquiry phase wherein numerous questions are asked about the picture. This tool offers a method in which the child can talk about family dynamics in a non-threatening and indirect manner.

Proponents of the KFDS assert that the tool can be used to generate hypotheses about the child’s family dynamics and the child’s personality. One of the guidebooks suggests a variety of hypotheses be formed based on the characteristics of the drawings. For example, a child that uses stick figures may be resisting to the test setting, have a low IQ, or a use of

regression as a defense mechanism (Knoff & Prout, 1985). In addition, if an examinee draws the symbol of a snake, the handbook provides the hypothesis of the snake being a “phallic symbol indicative of sexual tension” (p. 18). As was the case with the H-T-P interpretive guides, empirical support for these statements is either extremely limited or non-existent.

Thematic Apperception Test/Children’s Apperception Test. The Thematic Apperception Test (TAT) is a story-telling technique designed to reveal a subject’s personality dynamics. Upon being presented with a picture on a card, the examinee is asked to describe what is happening in the picture, and to subsequently speculate as to what happened before and after the picture (Tomkins, 1947). Similar to the TAT is the Children’s Apperception Test (CAT), which claims to assess a child’s personality using the same basic premise and methodology as the TAT (Kroon, Goudena, & Rispens, 1998). The CAT offers two alternative forms, one in which people are the central figures in each picture, while the other uses animals as main characters.

Kroon, Goudena, and Rispens (1998) state that, “a psychodynamically trained clinician will easily recognize themes from psychodynamic developmental theory, such as feeding problems, toilet training, Oedipal feelings, sibling rivalry, and aggression” (p. 102). Nevertheless, the authors note that the CAT lacks psychometric robustness, a systematic method for administration, and empirical validation of the interpretive method employed. Similar to the H-T-P and KFDS, the TAT/CAT fails to meet the basic standards of reliable and valid assessment of children set forth by the American Psychological Association, American Educational Research Association, and National Council on Measurement in Education in 2010.

The current study sought to extend previous research exploring the assessment practices of school psychologists by focusing on the school-based use of projective assessment techniques (e.g., H-T-P, KFDS, TAT/CAT) in ED eligibility evaluations. This was accomplished through a survey of practicing school psychologists that addressed the following research questions:

Research Question #1 – Do school psychologists find projective techniques to be useful in identifying children with an ED?

Research Question #2 – How frequently are projective techniques used in school-based ED evaluations, and does this depend on how recently the school psychologist was trained?

Research Question #3 – What are the most widely used projective techniques in initial ED evaluations?

Method

Participants and Procedures

School psychologists were recruited through the National Association of School Psychologists (NASP). All respondents were asked to complete an online survey of ED assessment practices in the schools. A total of 214 participants completed the survey. 172 were female (80.4%) and 42 were male (19.6%; two declined to report their gender). The majority of participants were Caucasian ($n=196$; 91.6%), 8 were African-American (3.7%), 6 were Hispanic (2.8%), and 1 was Native American (0.5%). “Specialist” was the most

commonly identified degree earned among the group ($n=124$; 57.9%), followed by “Masters” ($n=48$; 22.4%) and “Doctorate” ($n=40$; 18.7%). The mean experience as a school psychologist was 11.2 years ($SD=8.4$).

Participants completed the 32-item ED Assessment Practice Survey, which was created by the principal investigators and hosted through an internet survey service. Several items prompted respondents to identify the frequency with which they utilized various assessment tools/instruments (e.g., behavior rating scales, self-report measures, projective techniques) and other data collection techniques (e.g., diagnostic interviews, observations, developmental questionnaires) when ED was reported as a referral concern. Additional items instructed the respondents to rate the perceived usefulness of each tool/data collection technique in identifying students with ED.

Results and Discussion

Although research suggests that school psychologists understand the importance of utilizing a variety of assessment tools and sources of clinical data, actual practice is less consistent (Allen & Hanchon, 2013; Hanchon & Allen, 2013). These studies suggested that most school psychologists (>50%) meet the expectation of conducting comprehensive ED evaluations, as indicated by the inclusion of common assessment techniques (e.g., behavior ratings scales, teacher interview, developmental questionnaires) in all ED eligibility determinations. Nevertheless, our work revealed that approximately 20% of school psychologists failed to routinely include several of these techniques (e.g., parent interviews) that most experts deem critical to ethical diagnostic decision-making when ED is under consideration.

It seems plausible that variability in selecting assessment tools and other important sources of data are the direct result of a federal definition that does very little to aid in the determination of ED eligibility or to promote a valid conceptual understanding of emotional disturbance as a construct. As a result, school psychologists are left to rely principally on their own clinical judgment when making these high-stakes ED eligibility determinations on behalf of troubled children and youth. The results of the current study draw into question the clinical judgement used when selecting appropriate evaluation tools. For example, when asked their opinions of the usefulness of projectives, approximately 10% of respondents reported that data from these techniques are “critical” for determining ED eligibility, while another 56% found them to be “somewhat useful” to “very useful”. Only 34% of respondents rated projective techniques as “not useful” (see Figure 1) in determining ED eligibility. It appears these beliefs regarding the usefulness of projectives is directly related to the inclusion of these techniques in school-based ED evaluations.

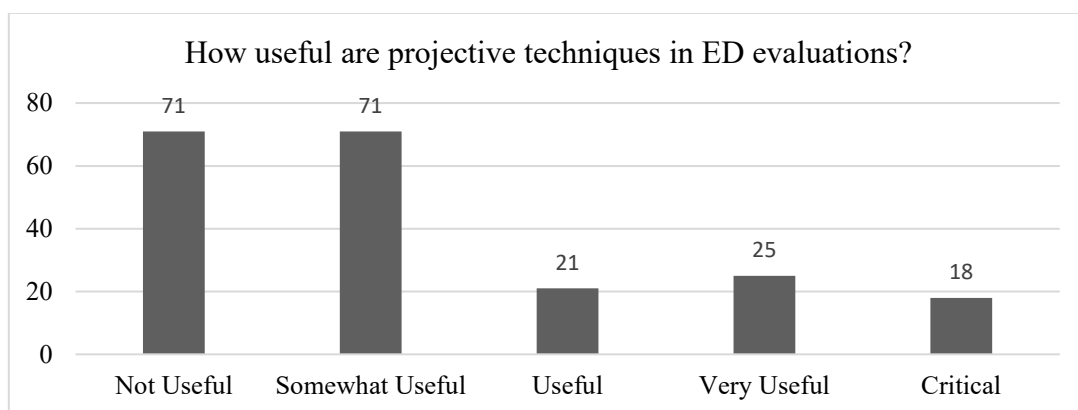


Figure 1: *How useful are projective techniques in ED evaluations?* (n=206)

Thirty-seven percent of respondents indicated that they “frequently” or “always” include projective techniques in their initial ED evaluations (see Figure 2). Another 32% of the sample reported at least “occasionally” using the techniques, while 31% “never” included them. An independent samples t-test revealed no differences, in terms of projective use, between school psychologists with less than 10 years of experience and those with greater than 10 years of experience ($p > .01$). These results were unexpected given the paucity of contemporary research supporting the use of projective instruments. As researchers, we are left with questions regarding how practitioners reconcile the poor psychometric properties of these techniques with the ethical obligation to meet professional standards of practice.

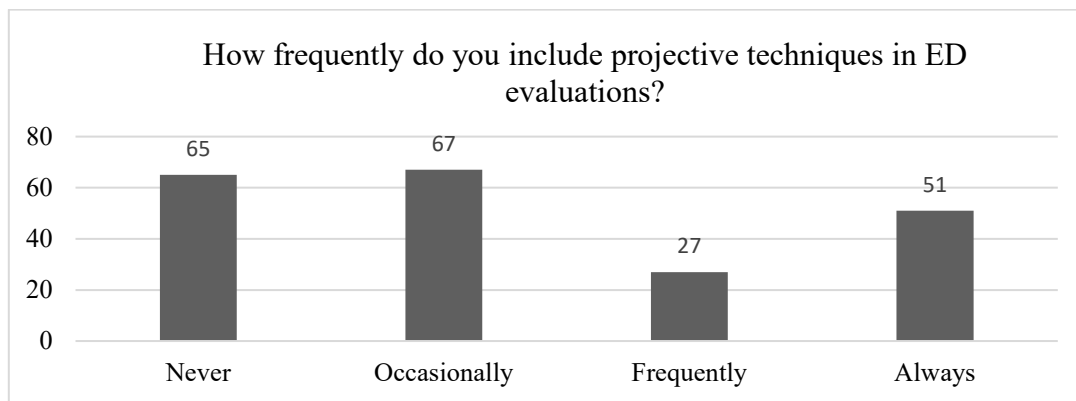


Figure 2: *How frequently do you include projective techniques in ED evaluations?* (n=210)

Of the 145 respondents that reported at least occasional use of projectives, 131 chose to respond to a follow-up question asking them to identify the specific techniques they used most frequently. These results are presented in Table 1. Within our sample, the drawing techniques were most popular (i.e., H-T-P, KFDS, Draw-a-Person), with approximately one quarter of this subset of respondents indicating their use in the majority of ED evaluations (>50% of all ED evaluations). Again, these results were unexpected given the inherent problems with the standardization, reliability, and validity of these instruments. Furthermore, the manuals (Buck, 1964; Knoff & Prout, 1985; Ogdon, 1977) for interpreting these particular drawing techniques are outdated and fraught with unsubstantiated sexual references and comments insensitive to various groups (e.g., the LBGT community).

The respondents reported the use of other alternative projective assessment techniques on a much less frequent basis (see Table 1). Only 1-3% of those who use projective techniques reported the use of the TAT, CAT, or Rorschach. Such findings were not unexpected given these instruments' focus on adult populations.

Table 1
Percentage of School Psychologist's Evaluations that include each Projective Technique, Respondents reporting at least occasional use of projective techniques (n=131)

<u>Projective Technique (% of time included)</u>	<u>51 – 100%</u>	<u>11 – 50%</u>	<u>0 – 10%</u>
House-Tree-Person (HTP)	34	31	66
Kinetic Family Drawing	33	29	69
Thematic Apperception Test	4	10	117
Children's Apperception Test	2	12	117
Bender-Gestalt	6	10	115
Rorschach	3	2	126
Draw-a-Person (DAP)	27	21	83

n=131

Conclusion

Four decades after the first special education law was passed by the U.S. congress, the category ED continues to be a source of controversy within the field of psychological assessment (Merrell & Walker, 2004). The ED criteria adopted in the 1975 landmark legislation (and still in effect today) originated from research that was conducted in the 1960s (Bower, 1982). Since then, psychologists have struggled to identify students with ED, largely due to eligibility criteria that have been characterized as vague, poorly defined, and professionally indefensible (e.g., Olympia et al., 2004; Skiba, Grizzle, & Minke, 1994).

Despite evidence of dubious reliability and validity (Garb et al., 2002; Lilienfeld, Ammirati, & David, 2012; Miller & Nickerson, 2006), 31% of respondents use projective techniques in the majority (>50%) of evaluations, and 19-24% use them in all ED evaluations. Among the projective measures, those with the least empirical support (e.g., H-T-P, KFDS) were most widely used. No differences were found between psychologists with <10 years of experience and those with 10+ years of experience (p.>.01). Trainers and practitioners are encouraged to review contemporary research and consider the appropriateness of including these measures in evaluations of a vulnerable and underserved population of children.

Limitations

The data and results presented in this paper include several limitations. First, the study is based on data collected from only 214 school psychologists practicing in relatively restricted geographic regions. Further study of ED assessment practices incorporating a broader and more representative sample is necessary. Second, the results were based on retrospective

estimates made by school psychologists regarding their assessment practices. An examination of the actual assessment techniques included in these evaluations would result in a more accurate accounting of current practices. This could occur through an examination of district, state, and national data pools.

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Developing Culturally Responsive Transition Plans Using the Indicator 13 Checklist

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Abstract

Research has shown that there are consistently poor post-school outcomes for students with disabilities, especially for students from culturally and linguistically diverse (CLD) backgrounds. Therefore, it is important for educators to develop culturally responsive transition plans for youth from CLD backgrounds that address their needs. Professionals working with this population can also benefit from using the National Secondary Transition Technical Assistance Center's (NSTTAC) Indicator 13 checklist when developing these transition plans. Using a vignette, this article outlines a step-by-step process for familiarizing oneself with the Indicator 13 checklist, identifying one's own cultural values and the family's values, and identifying the difference between the educator's and family's values as a suggested practice for developing a cohesive and culturally responsive transition plan.

Keywords: transition, culturally responsive, individualized transition plans

Developing Culturally Responsive Transition Plans Using the Indicator 13 Checklist

Post-school outcomes for youth with disabilities continue to be dismal despite federal mandates that schools improve student outcomes (Johnson, Stodden, Emanuel, Luecking, & Mack, 2002), especially for students with disabilities from CLD backgrounds. In a comparison of employment rates for young adults with disabilities (i.e., aged 21-25 years old) to peers within the general population, the employment rate was as low as 30.1% (i.e., those within the disability category of deaf/blindness), while peers in the general population had an employment rate of 66.1% (Newman et al., 2011). When analyzing how race/ethnicity influenced employment status, data show African-American and Hispanic young adults with disabilities are less likely than White peers to be employed long-term (Newman et al., 2011). For example, in 2009, 64.5% of White young adults with disabilities had paid jobs outside the home as opposed to 48% of African-American young adults with disabilities, and 53.6% of Hispanic young adults with disabilities (Newman et al., 2011). According to Avoke and Simon-Burroughs (2007), poor adult outcomes for students from culturally and linguistically diverse (CLD) backgrounds (i.e., low graduation rates, low completion rates) are likely the result of students' difficulty adjusting to postsecondary environments and lack of preparation to enter the workforce.

Not only have post-school outcome data shown variability across domain areas (i.e., post-secondary education, employment, and independent living), the number of CLD students receiving special education services under the Individuals with Disabilities Education Act (IDEA) has increased. Both the inconsistency in domain areas and increase in identification of CLD students are problematic and reason for concern in the field of special education. For example, Aud, Fox, and KewalRamani (2010) reported an increased percentage of students ages 3 to 5 and 6 to 21 from ethnic backgrounds served under the IDEA between 1998 and 2007. Additionally, the National Center for Education Statistics (2016a) estimated that for the

2015-2016 school year, 14% of White students received special education services compared to 17% of American Indian/Alaskan Native students and 16% of African-American students. Moreover, NCES (2016b) reported that in the 2012-2013 school year, African-American students with disabilities (55%) were the lowest population of students exiting school with a regular high school diploma followed by Hispanic students with disabilities (58%). This body of research in secondary and postsecondary special education illustrates why secondary special education educators, support staff, and transition educators should consider transitioning CLD students differently. In doing so, it is critical that educators recognize and utilize culturally responsive pedagogy.

Culturally Responsive Pedagogy and Self-Determination

As one of the first researchers in culturally responsive pedagogy, Ladson-Billings (1994) defined culturally responsive teaching as a pedagogy that acknowledges the significance of including students' cultural references in all facets of learning, one "that empowers students intellectually, socially, emotionally, and politically using cultural referents to impart knowledge, skills, and attitudes" (pp. 16–17). Her culturally relevant pedagogy encompasses three components. First, culturally relevant educators should frame their thinking around their students' long-term achievement, rather than accomplishment on end-of-year tests (Aronson & Laughter, 2016). Second, there should be an emphasis on cultural competence which is "helping students to recognize and honor their own cultural beliefs and practices while acquiring access to the wider culture" (Ladson-Billings, 2006, p. 36). Third, Ladson-Billings (1995) recommends that educators seek to develop sociopolitical consciousness inclusive of finding ways for "students to recognize, understand, and critique current and social inequalities" (p. 476).

According to Turnbull, Turnbull, Erwin, Soodak, and Shogren (2011), in special education cultural responsiveness can also signify an educator's self-awareness in relation to culture and his/her understanding of and acknowledgement of the CLD family's experiences and background. Self-awareness is an important component of self-determination which is a term often referenced in special education when identifying the success of students with disabilities as they transition from high school to the adult world. There have been many definitions of self-determination; however, Field, Martin, Miller, Ward, and Wehmeyer (1998) provided a comprehensive definition that embodies what self-determination is since it gained recognition in the literature in the 1980s. According to Field et al. (1998), self-determination is defined as:

A combination of skills, knowledge, and beliefs that enable a person to engage in goal-directed, self-regulated, autonomous behavior. An understanding of one's strengths and limitations together with a belief in oneself as capable and effective are essential to self-determination. When acting on the basis of these skills and attitudes, individuals have greater ability to take control of their lives and assume the role of

Although self-determination can be viewed in different ways, in this situation an educator for example may view self-determination as graduating from high school and leaving the home and living completely independently from the family; however, that may not be how some families view self-determination. Therefore, one way to practice cultural responsiveness would be for the educator to evaluate their assumptions, self-reflect on their views of self-determination, and discuss these views with the family in order to increase awareness of other groups' cultural values.

Purpose of Developing Culturally Responsive Transition Plans

In addition to analyzing students with disabilities post-school outcome data, states are responsible for monitoring their implementation of the IDEA amendments of 2004 on 20 indicators in their State Performance Plans (SPP) (IDEA, 2004b). Indicator 13 focuses specifically on successfully preparing students with disabilities for transition from high school to postsecondary settings through the development of appropriate transition plans and services. It specifies that professionals adhere to specific guidelines when writing the transition component of the IEP. The Indicator 13 Checklist aligns with this focus and specifies the components of an individualized transition plan (ITP) which includes measurable postsecondary goals, transition services, and courses of study based on age-appropriate transition assessment. The National Secondary Transition Technical Assistance Center (NSTTAC) developed this checklist (see Figure 1 and transitionta.org for the NSTTAC Indicator 13 checklist) in collaboration with the Office of Special Education Programs (OSEP) to assist states in their compliance with Indicator 13 requirements. Becoming familiar with the checklist holds value for secondary educators because it contains eight questions; each related to different transition topics including writing the postsecondary goals, transition services, and ensuring the appropriate course of study to help the student transition to training, education, employment, and independent living (if applicable). The combination of questions in the checklist are valuable because they address the key provisions on transition addressed in the IDEA Amendments of 2004 as described in the definition:

The term “transition services” means a coordinated set of activities for a child with a disability that is designed to be within a results-oriented process, that is focused on improving the academic and functional achievement of the child with a disability to facilitate the child’s movement from school to post-school activities, including postsecondary education, vocational education, integrated employment (including supported employment), continuing and adult education, adult services, independent living, or community participation; is based on the individual child’s needs, taking into account the child’s strengths, preferences and interests; and includes instruction, related services, community experiences, the development of employment and other post-school adult living objectives, and, if appropriate, acquisition of daily-living skills and functional vocational evaluation. (IDEA, 2004a)

Unfortunately, often in the preparation of transition plans, the needs of students within CLD populations are not recognized. For example, multicultural perspectives on self-determination are sometimes overlooked at IEP meetings when developing transition plans for youth from CLD backgrounds (Trainor, 2008). To illustrate this further, in some individualistic cultures where people are more likely to have an independent view of themselves, self-determination is viewed as a person’s individual rights and interests (Shogren & Ward, 2018). On the other hand, in some collectivist cultures where people are more likely to have interdependent views of themselves, self-determination is focused more on the family as a whole and contributing to that family as an adult to help in their success (Avoke & Simon-Burroughs, 2007; Greene, 2011). It is important that educators are aware of these different perspectives on self-determination so that they can prepare the most appropriate transition plans for youth from CLD backgrounds. Although Indicator 13 does not directly address the culturally diverse needs of CLD youth with disabilities, it can be used as a guide to ask questions that lead to more culturally responsive transition plans. Therefore, the purpose of this article is to introduce a step-by-step process for educators to follow to develop culturally responsive

transition plans that not only addresses the unique and diverse needs of CLD students with disabilities, but also supports states in maintaining their federal compliance with Indicator 13.

Developing Culturally Responsive Transition Plans Using the I-13 Checklist

Ms. Smith, a White female from a middle-class background, is a first-year high school teacher instructing students with various disabilities in a self-contained setting. To prepare for the upcoming school year, she read all of her students' Individualized Education Programs (IEPs) and noted their strengths and needs so she could address them in her daily instruction. In addition, one of her goals was to ensure that all of her students learned the transition skills they needed in high school to be successful in postsecondary education, employment, and independent living after they graduated. Three weeks into the start of the school year, Ms. Smith began preparing for her first IEP meeting with Sabah's family. Ms. Smith was a little nervous because this was her first IEP meeting and she didn't have much face-to-face communication with Sabah's parents other than waving hello or goodbye when they drop her off at school in the mornings.

Step 1: Identify the Indicator 13 Checklist Questions and Reflect on How They Relate to Cultural Responsiveness

When developing culturally responsive transition plans, it is important to begin the process by knowing the components of the Indicator 13 Checklist to deepen your practice and collaborating with the family to encourage cultural responsiveness and reflective teaching. Therefore, the first step in developing culturally responsive transition plans would be to identify the eight Indicator 13 questions and write them down in the left column of the planning guide titled "Indicator 13 Checklist Questions." (see Table 1). In addition, practitioners should take this opportunity to familiarize themselves with the components of a transition plan and reflect on how culture can inform the writing of these components. For example, how could a student's culture impact his/her postsecondary goals? Why would culture be a factor in the implementation of transition assessments?

Step 2: Identify Your Own Cultural Values and/or Practices

Often, educators make assumptions about families based on their own cultural contexts, values, and experiences, which is why when creating a culturally responsive transition plan, it is important to identify your own cultural values and practices to better enable you to understand differences that exist between your cultural values and practices and the values and practices held by some students and families (Kalyanpur & Harry, 2012). Therefore, the second step in creating a culturally responsive transition plan that meets the I-13 criteria is to identify your own cultural values (see Table 1) for each question in column one. Using this planning guide will allow transition educators to explicitly identify their own cultural values, and later determine how they compare or contrast with others' values.

After writing the eight questions in the planning guide, Ms. Smith realized that her cultural experiences as a White female were different from the family's experiences. For example, for question two, Ms. Smith reflected on updating her student's annual goals. During this reflection, she began to realize that family involvement could play a role in updating her student's annual transition goals. Therefore, she had to think about her own cultural experiences in relationship to this idea, and what she discovered was that only her mother and father attended meetings at school when she was a student. It was at that point Ms. Smith realized that most of the decisions made

related to her education were made by her immediate family members. This also helped her to realize that other cultures may not make decisions in the same manner and could rely on extended family members for their input. So, Ms. Smith decided to write that value in the second column of the planning guide that corresponded to question two.

Step 3: Identify the Family's Values, Differentiate Between Values, and Collaborate to Develop the Transition Plan

The last step in creating culturally responsive transition plans using the I-13 checklist is to identify the family's values and determine how a professional's values may or may not differ from the family's values (Halley & Trujillo, 2013; Kalyanpur & Harry, 2012; Trainor & Patton, 2008). This step starts by learning about each family with whom you are working, which could be facilitated through increased communication. Increasing communication might begin with determining a family's primary language. Many educators make the faulty assumption that families have one primary language spoken at home, however many families from CLD backgrounds are multilingual households (Turnbull et al., 2011). For example, a parent's first language may be an indigenous language, such as in the case of a family from Cameroon, but the parent may also speak one or both of this predominately bilingual country's dominant languages, which are English and French. In essence, the student may be growing up in a trilingual household.

After completing column two of the planning guide that relates to Ms. Smith's own cultural values, she then began to think about Sabah's family. She decided to have a phone conversation with her family to learn more about their values, practices, and what was important to them during Sabah's transition. One of the things that came up in the conversation with Sabah's mother was the difference between family-centered vs. student-centered planning in the Indian culture. She learned that within Indian culture, values are more focused on the family and interdependence vs. independence outside of the home (Chadda & Deb, 2013). In addition, Sabah's mother stated that she did not see her leaving the home environment and living independently because of the important role Sabah's elders (her grandparents) have played in her upbringing, and that it was important for the family to stay together. From this conversation, Ms. Smith became more aware of the reasoning behind including both her parents in the planning process. She was also now cognizant of the importance of considering extended family members in facilitating transition services/activities so that Sabah is prepared to transition to postsecondary education and employment while living at home after high school. Based on what she learned from this and other conversations with the family, Ms. Smith continued working on the planning guide. For example, for question three, Ms. Smith wrote "Youth and families from CLD backgrounds may present novel pictures of family involvement," which could impact who completes transition assessments. Specifically, in Sabah's family, since it is important to consider extended family members, it could mean members of the family, outside her parents, may also complete transition assessments.

Once a good understanding of the family's values has been established, time should be devoted to examining whether there are differences between your values and the family's values, and developing collaborative actions with all stakeholders, especially the family, to create a culturally responsive transition plan. The key is for educators to work directly with students and families, educating them about the transition process and utilizing the Indicator 13 Checklist to create a transition plan that clearly addresses the student's and family's needs

(i.e., inclusive of the family's cultural or linguistic background). Oftentimes, educators have preconceived goals for their students that they would like them to fulfill after high school. However, sometimes educators forget the student has his/her own interests and goals, and the role cultural values may play in the development of these goals. Therefore, it is critical for educators to self-reflect on their own values as well as identify how their students' values compare or contrast to them. For that reason, encouraging the involvement of families from CLD backgrounds in the transition planning process is critical for not only the family, but for helping ensure the student's transition needs are being met, and that the family has a voice in making sure this happens successfully. Once these values have been identified and analyzed, collaborative actions should be implemented so the transition plan can be written according to the Indicator 13 criteria, as well as the student's cultural needs. It is important to note that these collaborative actions can vary depending on which question is being addressed in the Indicator 13 Checklist, and should include necessary stakeholders (e.g., school personnel, guidance counselors, adult service providers). For example, question eight in the checklist (see Table 1) asks whether a representative from a participating agency was invited to the IEP meeting with prior consent from the family or student who has reached age of majority. However, in some rural and urban areas, there may not be a variety of agencies for families from culturally and linguistically diverse backgrounds to access during their son's/daughter's transition. Therefore, it would be advantageous for educators to become familiar with these agencies and the communities that they serve. This will allow them to provide support within the school or collaborate with the agencies by connecting families with transportation so they may access proper adult service providers. In addition, educators could reach out to a cultural broker, defined by Jezewski and Sotnik (2001) as being an advocate who is biracial and bilingual that serves to connect persons of different cultural backgrounds to improve relationships and help problem solve.

Note that while the planning guide provided contains examples to reflect values and collaborative actions specific to the vignette, Table 2 provides additional examples of family values that may be seen across populations from CLD backgrounds, as well as collaborative actions that various stakeholders could implement to meet their needs. A blank version of the planning guide is also provided for practical usage (see Table 3).

Based on the values and practices Ms. Smith wrote for question one in the planning guide, she realized there was a significant difference between the values identified by Sabah's family and her own values and practices. Given these differences, Ms. Smith made a promise to continue discussing with Sabah's family their current beliefs on values and principles so she was always aware of how they viewed different aspects of transition, and so she could be respectful of their culture. This is why she wrote "discuss current belief values and principles" in the fourth column of the planning guide, so she had a written reminder that the difference in values could inform writing postsecondary goals, and that she should maintain an open line of communication with the family. Furthermore, for question three, she wrote "focus on family-centered planning vs. student-centered planning and ensure all assessments are administered in the student's native language." Since extended family members could be equally involved in transition planning, Ms. Smith wanted to make sure she was meeting each of the family member's needs by not only having them involved, but also offering transition assessments in their native language to ensure she receives accurate assessment data.

Conclusion

As outcomes for students with disabilities from CLD backgrounds continue to be less positive than students from non-minority backgrounds (Sanford et al., 2011; Wagner,

Newman, Cameto, Garza, & Levine, 2005), attention is needed to address their transition from high school to the adult world. Therefore, as a suggested practice to aid in this transition, educators can create culturally responsive transition plans. The creation of culturally responsive transition plans requires educators to follow a step-by-step process inclusive of becoming familiar with the Indicator 13 Checklist; identifying their own cultural values and those of CLD families; and differentiating between the two, to make collaborative decisions to address the diverse needs of the CLD population.

NSTTAC Indicator 13 Checklist: Form B (Enhanced for Professional Development)

Percent of youth with IEPs aged 16 and above with an IEP that includes appropriate measurable postsecondary goals that are annually updated and based upon an age appropriate transition assessment, transition services, including courses of study, that will reasonably enable the student to meet those postsecondary goals, and annual IEP goals related to the student's transition services needs. There also must be evidence that the student was invited to the IEP Team meeting where transition services are to be discussed and evidence that, if appropriate, a representative of any participating agency was invited to the IEP Team meeting with the prior consent of the parent or student who has reached the age of majority. (20 U.S.C. 1416(a)(3)(B))

Questions	Postsecondary Goals			
	Training	Education	Employment	Independent Living skills
1. Is there an appropriate measurable postsecondary goal or goals in this area?	Y N	Y N	Y N	Y N NA
Can the goal(s) be counted? Will the goal(s) occur <i>after</i> the student graduates from school? Based on the information available about this student, does (do) the postsecondary goal(s) seem appropriate for this student? • If yes to all three guiding questions above, then circle Y OR if a postsecondary goal(s) is (are) <i>not</i> stated, circle N				
2. Is (are) the postsecondary goal(s) updated annually?	Y N	Y N	Y N	Y N NA
Was (were) the postsecondary goal(s) addressed/ updated in conjunction with the development of the current IEP? • If yes, then circle Y OR if the postsecondary goal(s) was (were) <i>not</i> updated with the current IEP, circle N				
3. Is there evidence that the measurable postsecondary goal(s) were based on age appropriate transition assessment?	Y N	Y N	Y N	Y N
Is the use of transition assessment(s) for the postsecondary goal(s) mentioned in the IEP or evident in the student's file? • If yes, then circle Y OR if no, then circle N				
4. Are there transition services in the IEP that will reasonably enable the student to meet his or her postsecondary goal(s)?	Y N	Y N	Y N	Y N
Is a type of instruction, related service, community experience, or development of employment and other post-school adult living objectives, and if appropriate, acquisition of daily living skills, and provision of a functional vocational evaluation listed in association with meeting the post-secondary goal(s)? • If yes, then circle Y OR if no, then circle N				
5. Do the transition services include courses of study that will reasonably enable the student to meet his or her postsecondary goal(s)?	Y N	Y N	Y N	Y N
Do the transition services include courses of study that align with the student's postsecondary goal(s)? • If yes, then circle Y OR if no, then circle N				
6. Is (are) there annual IEP goal(s) related to the student's transition services needs?	Y N	Y N	Y N	Y N
Is (are) an annual goal(s) included in the IEP that is/are related to the student's transition services needs? • If yes, then circle Y OR if no, then circle N				
7. Is there evidence that the student was invited to the IEP Team meeting where transition services were discussed?	Y N	Y N	Y N	Y N
For the current year, is there documented evidence in the IEP or cumulative folder that the student was invited to attend the IEP Team meeting? • If yes, then circle Y OR if no, then circle N				
8. If appropriate, is there evidence that a representative of any participating agency was invited to the IEP Team meeting with the prior consent of the parent or student who has reached the age of majority?	Y N NA	Y N NA	Y N NA	Y N NA
For the current year, is there evidence in the IEP that representatives of any of the following agencies/services were invited to participate in the IEP development including but not limited to: <i>postsecondary education, vocational education, integrated employment (including supported employment), continuing and adult education, adult services, independent living or community participation</i> for this post-secondary goal? Was consent obtained from the parent (or student, for a student the age of majority)? • If yes to both, then circle Y • If no invitation is evident and a participating agency is likely to be responsible for providing or paying for transition services and there was consent to invite them to the IEP meeting, then circle N • If it is too early to determine if the student will need outside agency involvement, or no agency is likely to provide or pay for transition services, circle NA • If parent or individual student consent (when appropriate) was <i>not</i> provided, circle NA				
Does the IEP meet the requirements of Indicator 13? (Circle one) Yes (all Ys or NAs for each item [1-8] on the checklist included in the IEP are circled) or No (one or more Ns circled)				

Figure 1. NSTTAC Indicator 13 Checklist.

Table 1. Planning guide. This table illustrates using the Indicator 13 checklist to reflect on values and develop collaborative actions.

Indicator 13 Checklist Questions	Dominant Cultural Values	Some CLD Family's Values	Identify Difference Between Educator's and Family's Values and Collaborate to Develop the ITP
1. Are there appropriate measurable postsecondary goals in the areas of training, education, employment, and, where appropriate, independent living skills?	<ul style="list-style-type: none"> ● Belief in independence by living outside of the home after high school ● Belief in individualistic views of self-determination 	<ul style="list-style-type: none"> ● Youth and families from CLD backgrounds may have different definitions of independence ● Youth and families from CLD backgrounds may have different definitions of self-determination 	<ul style="list-style-type: none"> ● Discuss current belief values and principles, and the differences between these values ● Identify the student's interests, preferences, and needs and determine how cultural values can be addressed in postsecondary goals
2. Are the postsecondary goals updated annually?	<ul style="list-style-type: none"> ● Focus on only updating goals annually ● Focus on discussing goals with immediate family members 	<ul style="list-style-type: none"> ● Youth and families from CLD backgrounds may encourage open communication and updating goals more frequently ● Decision making when determining goals may include extended family members 	<ul style="list-style-type: none"> ● Focus on family-centered planning vs. student-centered planning ● Create an inclusive environment so that all family members involved in decision making feel equally involved in the transition planning process
3. Is there evidence that the measurable postsecondary goals were based on age appropriate transition assessments?	<ul style="list-style-type: none"> ● Focus on individual choice and increased family involvement ● Determine which transition assessments can be completed at school 	<ul style="list-style-type: none"> ● Youth and families from CLD backgrounds may demonstrate novel pictures of family involvement ● Families may define involvement differently 	<ul style="list-style-type: none"> ● Focus on family-centered planning vs. student centered planning and research information related to the family's preferred communication style ● Ensure all assessments are administered in the student's native language ● Consult with family to determine who (if any) would be willing to complete the parent portion of transition assessments
4. Are there transition services in the IEP that will reasonably enable the student to meet his or her postsecondary goals?	<ul style="list-style-type: none"> ● Focus on traditional gender roles at home and in the employment setting 	<ul style="list-style-type: none"> ● Families from CLD backgrounds may have different family structures and may not follow the traditional gender roles 	<ul style="list-style-type: none"> ● Become familiar with gender differences and male-female interactions across cultures so that the transition services are preparing the student for the appropriate postsecondary goals that are a true reflection of the family's culture

<p>5. Do the transition services include courses of study that will reasonably enable the student to meet his or her postsecondary goals?</p>	<ul style="list-style-type: none"> ● Focus on student choice regarding coursework 	<ul style="list-style-type: none"> ● Families from CLD backgrounds may rely on the educator's expertise to provide academic instruction and direction 	<ul style="list-style-type: none"> ● Become familiar with how education is perceived across cultures in order to have a better understanding of how it is valued
<p>6. Is (are) there annual IEP goal(s) related to the student's transition services needs?</p>	<ul style="list-style-type: none"> ● Focus on school personnel serving as the main persons responsible for implementing annual IEP goals 	<ul style="list-style-type: none"> ● Families from CLD backgrounds may encourage family members (both immediate and extended) to be included in the implementation of the annual IEP goals 	<ul style="list-style-type: none"> ● Develop a relationship with the family showing mutual trust, respect, honesty, and open communication so all family members feel comfortable in offering their opinions on the types of annual goals that should be included in the IEP
<p>7. Is there evidence that the student was invited to the IEP Team meeting where transition services were discussed?</p>	<ul style="list-style-type: none"> ● Focus on student's rights in relation to self-advocacy 	<ul style="list-style-type: none"> ● Families and youth from CLD backgrounds may not share the same belief systems about rights, equality, and individualism with school personnel 	<ul style="list-style-type: none"> ● Become familiar with the family's belief systems about rights and equality in any sub-cultures within general cultures and discuss a level of involvement that the family is comfortable with for the student to be a meaningful participant in the IEP Team meeting
<p>8. If appropriate, is there evidence that a representative of any participating agency was invited to the IEP Team meeting with the prior consent of the parent or student who has reached age of majority?</p>	<ul style="list-style-type: none"> ● Focus on seeking support from outside agencies 	<ul style="list-style-type: none"> ● Families and youth from CLD backgrounds may feel most comfortable receiving services from people they can trust, such as other family members and close friends than from professionals and formal social networks ● Youth and families from CLD backgrounds may find it difficult to explain their cultural traditions and customs to professionals, or to understand cultural assumptions made by professionals in service recommendations 	<ul style="list-style-type: none"> ● Become familiar with the differences in availability of community organizations to CLD groups in urban and rural areas ● Collaborate with adult service providers within each family's current community and host an open house with language interpreters so that families can meet the organizations and ask questions about services provided ● Distribute materials from local education agency and adult service provider(s) in the families' native languages

Table 2. Additional examples of values and suggested collaborative actions and persons responsible.

Family's Values	Suggested Collaborative Actions & Persons Responsible
Youth and families from culturally and linguistically diverse backgrounds may have different preferences in their communication style.	<ul style="list-style-type: none"> ● Make sure verbal exchanges are direct and provide ample opportunities for family to ask questions. <i>Persons responsible: School personnel (i.e., IEP & ITP team)</i> ● Become familiar with different forms of non-verbal communication (e.g., bowing of head, respectful silence). <i>Persons responsible: School personnel (i.e., IEP & ITP team) and adult service providers</i> ● Provide ample time to arrange resources for interpretation and translation services at meetings. <i>Persons responsible: School personnel (i.e., IEP & ITP team)</i>
Resources to pursue postsecondary education/training or community experiences may not be accessible to youth from CLD backgrounds.	<ul style="list-style-type: none"> ● Discuss availability of financial aid for youth from CLD backgrounds to pursue postsecondary education. <i>Persons responsible: School personnel (i.e., transition educator and guidance counselor)</i> ● Develop a resource guide written in different languages with local resources that will help students in their transition to postsecondary education, employment, and independent living. <i>Persons responsible: School personnel (i.e., transition educator)</i>
Youth and families from CLD backgrounds may have differing definitions of how individuals with disabilities are perceived working in the community.	<ul style="list-style-type: none"> ● Engage family in a conversation on their religious beliefs and how they view the concept of disabilities to determine any potential stigma or how people with disabilities are viewed working in the community. <i>Persons responsible: School personnel (i.e., transition educator and assistive technology liaison, job coach)</i> ● Learn the symbols and meanings in the culture (e.g., national emblems) to understand the culture's identity which could provide a better understanding of the family's concerns. <i>Persons responsible: School personnel (i.e., IEP & ITP team)</i>
Materials related to special education rights and responsibilities may not be accessible or readily available to youth and families from CLD backgrounds to enable them to fully understand their legal rights (e.g., free and appropriate public education till 21 years of age and age of majority).	<ul style="list-style-type: none"> ● Provide procedural safeguards to the family in their native language. <i>Persons responsible: School personnel (i.e., IEP & ITP team)</i> ● Connect family with their local Parent Information Training Center. <i>Persons responsible: School personnel (i.e., IEP & ITP team)</i> ● Accommodate family needs in order to attend meetings (e.g., may be customary to meet in the family's home) so that they can obtain the proper information. <i>Persons responsible: School personnel (i.e., IEP & ITP team)</i>
Youth and families from CLD backgrounds may have different understandings of culturally-normative behavior or what is	<ul style="list-style-type: none"> ● Engage family in a discussion on the meaning of "culturally-normative behavior." <i>Persons responsible: School personnel (i.e., IEP & ITP team)</i>

considered “typical” within the pre-dominant school or work culture.

- Educate others, especially the student’s natural supports, in the community on what culturally-normative behavior is in the student’s culture. *Persons responsible: School personnel (i.e., IEP & ITP team) and adult service providers*

Table 3. Blank version of the planning guide.

Indicator 13 Checklist Questions	Dominant Cultural Values	Some CLD Family's Values	Identify Difference Between Educator's and Family's Values and Collaborate to Develop the ITP
1.Are there appropriate measurable postsecondary goals in the areas of training, education, employment, and, where appropriate, independent living skills?			
2.Are the postsecondary goals updated annually?			
3.Is there evidence that the measurable postsecondary goals were based on age appropriate transition assessments?			
4.Are there transition services in the IEP that will reasonably enable the student to meet his or her postsecondary goals?			

5. Do the transition services include courses of study that will reasonably enable the student to meet his or her postsecondary goals?			
6. Is (are) there annual IEP goal(s) related to the student's transition services needs?			
7. Is there evidence that the student was invited to the IEP Team meeting where transition services were discussed?			
8. If appropriate, is there evidence that a representative of any participating agency was invited to the IEP Team meeting with the prior consent of the parent or student who has reached age of majority?			

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An Assessment of Perceived Antecedents to Attitudes of College Students towards Children with Autism

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Abstract

This study examined the extent to which six antecedent variables influenced college students' attitudes towards autism. A comprehensive literature review and factor analysis identified the six perceived antecedents, including *learning and volunteer experience*, *family/friends with autism*, *parental role*, *exposure to children with autism*, *mass media influence*, and *inclusion belief toward autism*. A total 195 college students participated in the study. Results of multiple regression analyses indicated that the regression model was significant ($p < .001$), and the six antecedent variables explained 18% of the variance. *Inclusion belief* was found to be a significant predictor of attitudes ($\beta = .32, p < .01$). In addition, *gender*, *student major*, *personal learning* and *volunteer experience* were found to influence personal attitudes.

An Assessment of Perceived Antecedents to Attitudes of College Students towards Children with Autism in the U.S.

Recent estimates suggest that one in every 68 children in the United States have an autism spectrum disorder and the trend suggests that the prevalence rate is on the rise (Centers for Disease Control and Prevention, 2014). This trend has significant implications for both the individuals with autism as well as society. Many people with the disability will require access to fundamental services such as education, healthcare, rehabilitation, and vocational training and society has to adapt in order to facilitate successful participation of the individuals. Unfortunately, barriers have been identified that stymie the successful access of services by individuals with disabilities in general (Miller 2010).

Miller (2010) reported that negative societal and professional attitudes still serve as a barrier for the successful functioning of individuals with disabilities. As a result, "improving the [outcomes] of individuals with disabilities requires assessing existing and future [professionals' and service providers'] attitudes about persons with disabilities" (Miller, 2010, p. 3). Previous research has examined the attitudes of professionals towards individuals with disabilities. Specifically,

researchers have examined the attitudes of school-teachers towards children with autism (e.g., Al-Shamari, 2006; Olley, DeVellis, DeVellis, Wall, & Long, 1981; Park & Chitiyo, 2009; Park, Chitiyo & Choi, 2010); others have examined the attitudes of health care providers towards individuals with disabilities in general (e.g., Miller, 2010). Still others have examined the attitudes of non-professionals towards children with disabilities (e.g., Reiter & Vitani, 2007; Swaim & Morgan, 2001; Chambres, Auxiette, Vansingle & Gill, 2008). It is encouraging that most of these studies indicate positive attitudes towards individuals with disabilities.

However, in spite of these positive reports, recent studies suggest that people with disabilities “are still reporting attitudinal barriers from society in general and from [certain] professionals in particular” (Miller 2010, p. 3). These attitudinal barriers may result in negative outcomes for individuals with disabilities in terms of education, employment, and participation in society in general (Siperstein, Norins, Corbin, & Shriver, 2003; Unger, 2002). Parusalam (2006), for example, identified attitude as one of the most important variables influencing educational outcomes among children with disabilities.

Given the importance of professionals’ attitudes towards individuals with disabilities, it is necessary to examine factors that shape these attitudes. Park and Chitiyo (2009) proposed a conceptual framework for examining the factors that influence attitude. The framework includes examination of both antecedents and consequences of professionals’ attitudes. The antecedents can be grouped into personal factors (e.g., gender and age of professional), social factors (e.g., the mass media, parental influence, and peer groups), exposure to children with autism (e.g., the type of contact one has with someone with autism), and other environmental factors (e.g., one’s level of education and professional development programs). According to Park and Chitiyo, this model could help us understand how professional attitudes are formed and maintained, which could assist us in our efforts to shape those attitudes.

To date, few studies have examined antecedents to attitudes towards autism. Morton and Campbell (2007) examined how information source affects peers’ initial cognitive and behavioral attitudes toward an unfamiliar child with autism. Results of that study indicated that attitudes toward autism varied depending on who provided explanatory information on autism. Campbell, Ferguson, Herzinger, Jackson and Marino (2005) found that sociometric status affected the social behaviors of typically developing peers towards children with autism. Similarly, Morton and Campbell (2008) examined how the media type affected attitudes towards autism and found no differences between live video or videotape channels of presentation of information. Other studies have examined the impact of factors such as contact (Slininger, Sherrill, & Jankowski, 2000) and demographics (Gray & Rodrigue, 2001) on attitudes towards individuals with disabilities in general. No doubt, these studies have helped us to better understand how we can promote positive attitudes towards disabilities and autism in particular. Nevertheless, there appears to be several issues still to be addressed as far as antecedents to attitudes towards autism are concerned (Campbell, 2006).

Campbell (2006) noted that little research has examined factors that influence attitude change, in adults, towards individuals with disabilities. Campbell also highlighted the need for research on variables that may serve as antecedents on attitudes towards autism. The purpose of this study was to extend research on antecedents to professionals’ attitudes towards autism. Specifically,

these researchers wanted to find out the extent to which different antecedent factors influence professionals' attitudes toward autism. In doing this, the researchers targeted college students because previous research suggested that the successful participation of college students with disabilities requires positive attitudes of their peers without disabilities and the entire college community (Johnson, 2006). Also, college students are future professionals who may become education, business and government leaders capable of influencing policy and, therefore, the successful participation of individuals with disabilities in both school settings as well as the workforce. In order to positively influence their attitudes, it is necessary first to understand the variables that influence their attitudes.

Method

Sample and Procedure

Data were collected from a convenience sample of 195 college students at a university in the Midwestern United States. Permission to conduct the survey was secured by the university's Human Subject Review Board. Data collection was completed at classrooms in the University's College of Education. In order to conduct the survey, the researchers first sought permission from faculty members in the departments. In addition, the researchers also contacted instructors and faculty members in departments who taught the university core curriculum courses, physical education teacher education, and sport administration. After receiving approval to conduct the surveys from the instructors, the researchers explained the purpose of the study to the study participants before administering the survey. Participation in the study was voluntary. Students who chose to participate completed a paper-and-pencil survey.

Measures

Perceived Antecedents Instrument. Based on a comprehensive review of the literature on attitude and attitude toward autism, the authors identified eight perceived antecedent factors including, exposure to children with autism (Royal & Roberts, 1987), teaching experience (Park et al., 2009), education and learning experience (Eagly & Chaiken, 1993), volunteer experience, parental role (Dalhouse & Frideres, 1996), inclusion belief towards autism (Blackwell, Miniard, & Engel, 2001), mass media influence (Fortunato, Sigafos, & Morsillo-Searls, 2007; Nelson, 2000), and influence of family and friends with autism (Rosenbaum et al., 1988). Based on the eight antecedent subscales, the authors developed a survey instrument that included a total of 24 items measuring an individual's perceived antecedents to attitude toward autism (see dimensions and items in Table 1). A professor in special education confirmed the content validity of the

Table 1

Perceived Antecedents: List of the Items Used

<u>Dimensions & Items</u>	
<u>Exposure to Children with Autism</u>	
ECA. 1	Spending time with children with autism promotes positive attitudes towards CWA ^a
ECA. 2	Going to school with someone with disabilities contributes to positive attitudes towards CWA
ECA. 3	Being in the same class with someone with autism contributes to positive attitudes towards CWA
<u>Teaching Experience</u>	
TE. 1	Teaching special education students contributes to positive attitudes towards CWA
TE. 2	Teaching students with autism contributes to positive attitudes CWA
<u>Education and Learning Experience</u>	
ELE. 1	Conducting autism seminars contributes to positive attitudes CWA
ELE. 2	Participation in autism workshops contributes to positive attitudes CWA
ELE. 3	Participation in education programs about autism contributes to positive attitudes CWA
ELE. 4	Learning about autism in college contributes to positive attitudes CWA
<u>Volunteer Experience</u>	
VE. 1	Doing volunteer work for children with autism contributes to positive attitudes towards CWA
VE. 2	Working for programs that provide services for children with autism contributes to positive attitudes toward CWA
VE. 3	Doing volunteer work for autism awareness programs contributes to positive attitudes towards CWA
<u>Inclusion Belief</u>	
IBA. 1	Inclusion contributes to positive attitudes towards CWA
IBA. 2	It is important to provide equal educational opportunity to individuals with disabilities
IBA. 3	Individuals with autism can make significant contribution to society
<u>Mass Media Influence</u>	
MMI. 1	Watching a lot of stories about autism on TV contributes to positive attitudes towards CWA
MMI. 2	Reading a lot of stories about autism in newspapers/magazines contributes to positive attitudes towards CWA
MMI. 3	Reading a lot about autism on the internet contributes to positive attitudes towards CWA
<u>Parental Role</u>	
PR. 1	Children whose parents teach them to respect individuals with autism develop positive attitudes towards CWA
PR. 2	Children whose parents teach them to respect individuals with disabilities develop positive attitudes towards CWA
PR. 3	Children with parents who support programs for in for individuals with disabilities have positive attitudes towards CWA

Family and Friends with Autism

- RFF. 1 Having a family member with autism leads one to appreciate individuals with autism
- RFF. 2 Having a relative with autism leads one to appreciate individuals with autism
- RFF. 3 Having a friend with autism leads one to appreciate individuals with autism
-

Note. ^aChildren with autism

instrument. All of the antecedent items were measured on a five-point Likert type scale (1 indicated 'strongly disagree' while 5 indicated 'strongly agree').

Internal consistency estimates (Cronback's Alpha) for each perceived antecedent subscale were computed to confirm the reliability of the subscales used in this study. All subscales showed satisfactory internal consistency estimates (.80-.94) except for the *inclusion belief* ($\alpha = .69$) subscale; this is acceptable. The reliability estimates for all the subscales were as follows: *exposure to children with autism* ($\alpha = .80$), *teaching experience* ($\alpha = .85$), *education and learning experience* ($\alpha = .92$), *volunteer experience* ($\alpha = .91$), *inclusion belief toward autism* ($\alpha = .69$ – item 13 deleted), *mass media influence* ($\alpha = .88$), *parental role* ($\alpha = .90$), and *influence of family and friends with autism* ($\alpha = .94$). The reliabilities of the measures were therefore, quite satisfactory (Nunnally, 1978). One item related to *inclusion belief* was deleted because the item had a low reliability estimate. Thus, the revised instrument consisted of 23 items.

This current study used the ChedoKe-McMaster Attitudes Towards Children with Handicaps (CATCH) scale in order to measure attitude (Rosenbaum et al., 1988). The CATCH scale includes three components: affective, cognitive, and behavioral components. The scale contains 36 items with 12 items in each component; however, Rosenbaum and colleagues deleted nine items out of the 36 items based on factor analysis. Rosenbaum and colleagues confirmed that the CATCH scale was psychometrically sound, and demonstrated good reliability and validity. In this current study, the 27-item CATCH scale was used to assess students' attitudes toward children with autism. Among the 27 items, 10 items were related to the affective component, eight items were associated with the cognitive component, and nine items were related to the behavioral component. The scale demonstrated good reliability ($\alpha = .85$). Several items were modified, in terms of language, to suit the context.

Data Analysis

Data were analyzed using the Statistical Package for Social Science (SPSS, version 16.0). First, an exploratory factor analysis was used to uncover the underlying structure of the eight perceived antecedent subscales. Second, descriptive and correlational analysis were conducted to report the mean scores of each antecedent variable and to examine the relationships among the independent variables (antecedents) and dependent variable (attitude). Third, a series of multiple regression analyses were carried out to investigate the effect of the perceived antecedent factors on attitude and behavioral intent. A series of analyses of variance were conducted to examine attitude differences with respect to the study participants' demographics (e.g., gender and major) and their different types of exposure to autism (e.g., teaching, volunteer, and learning experiences).

Results

Demographic Information

The average age of participants was 23.5 years. Approximately, 53 % ($n = 104$) were male, and 47% ($n = 91$) were female. Regarding race, 75% ($n = 146$) were White/Caucasian and 17% ($n = 34$) were African Americans. The other ethnic groups included Hispanics ($n = 3$, 1.6%), Asians ($n = 2$, 1%), Native Americans ($n = 1$, .5%), and others ($n = 5$, 2.6%).

In terms of students' career goals, 35 % ($n = 69$) indicated that they wanted to be either special education or general education teachers and 64% ($n = 117$) reported that they wanted to pursue other career fields.

Concerning different types of exposure to people with autism, 49 % ($n = 94$) reported that they had been in the same classroom with someone who had autism, 20% ($n = 51$) indicated that they participated in workshops about autism. Thirty-four percent ($n = 57$) reported that they

Table 2
Frequency and Percentage of Different Types of Exposure

Type of Exposure	Frequency	Percentage
Being in the same classroom with someone with autism	94	48.7
Teaching special education classes	46	23.6
Teaching children with autism	51	26.3
Participation in workshops about autism	38	19.6
Participation in education program about autism	67	34.4
Learning opportunity about autism in college	120	61.5
Volunteer work with children with autism	75	38.7
Working experiences (e.g., autism center)	68	34.9
Having family member who has autism	29	14.9
Having a relative who has autism	71	36.4

Note. $N = 195$

attended educational programs about autism and approximately 15% ($n = 29$) indicated that they had a family member who had autism. This information on different types of exposure is presented in Table 2.

Perceived Antecedents: Factor Analysis

The factor structure underlying the scales was examined using principal factoring with a varimax rotation (see Table 3). The eight factors were merged into five factors. Factor analytical analyses suggested a five-factor solution that explained 71.30 % of the variance in the data. Four out of the 23 items (TE.1, TE.2, ECA.1, and PR.1) were deleted, because either their communalities were less than .40 or those items had relatively small loadings on each of the factors. The value of the Kaiser-Meyer-Olkin statistic was .919, which indicates that factor analysis is appropriate for the data and can produce distinct and reliable factors (Hutcheson & Sofroniou, 1999). The five factors were (1) *learning and volunteer experience & inclusion belief* ($\alpha = .94$), (2)

family/friends with autism ($\alpha = .94$), (3) parental role ($\alpha = .86$), (4) exposure to children with autism ($\alpha = .80$), and (5) mass media influence ($\alpha = .88$).

Table 3

Results of Factor Analysis: Perceived Antecedents to Attitudes Toward Children with Autism

	<i>F1</i> <i>Learning and</i> <i>Volunteer</i> <i>Experience</i> <i>& Inclusion</i> ^a	<i>F2</i> <i>Family/Friends</i> <i>with Autism</i>	<i>F3</i> <i>Parental</i> <i>Role</i>	<i>F4</i> <i>Exposure to</i> <i>Children with</i> <i>Autism</i>	<i>F5</i> <i>Mass Media</i> <i>Influence</i>
ELE. 1	.811				
ELE. 2	.845				
ELE. 3	.833				
ELE. 4	.646				
VE. 1	.643				
VE. 2	.649				
VE. 3	.603				
IBA. 2	.581				
IBA. 3	.440				
RFF. 1		.837			
RFF. 2		.857			
RFF. 3		.856			
PR. 2			.820		
PR. 3			.692		
ECA. 2				.803	
ECA. 3				.797	
MMI. 1					.889
MMI. 2					.870
MMI. 3					.767
% of	51.12	7.93	5.58	4.46	4.21
Variance					
Cronbach's	.94	.94	.86	.80	.88
α					

Note 1. ^a Learning and volunteer experience & inclusion belief

The exploratory factor analysis indicated that the previous three antecedent factors, which include *education and learning experience, volunteer experience, and inclusion belief* were merged together. However, because the *inclusion belief* subscale is theoretically different from the other two factors, it was considered to be a separate subscale. Therefore, the previous eight factors produced six factors, and the final version of the instrument assessing antecedents to attitude toward autism contained a total of 19 items and demonstrated a very high reliability ($\alpha = .94$). In addition, internal consistency estimates (Cronbach's Alpha) for each subscale were computed to confirm the reliability of the subscales. The reliabilities estimates for all factors were above the cutoff of .70, except for *inclusion belief* (.69) that can be considered to be acceptable. Therefore, the reliabilities of the measures were quite satisfactory (Nunnally, 1978).

Descriptive Statistics and Correlational Analysis

As indicated in Table 4, the participants of this study perceived *family/friends with autism* as the most important factor affecting attitudes ($M = 4.65$, $SD = 0.67$). *Inclusion belief* was found to be the second most important antecedent factor ($M = 4.55$, $SD = 0.66$), followed by *parental role* ($M = 4.52$, $SD = 0.66$), *learning and volunteer experience* ($M = 4.34$, $SD = 0.70$), *exposure to children with autism* ($M = 4.09$, $SD = 0.75$), and *mass media influence* ($M = 3.76$, $SD = 0.82$). Concerning attitude toward children with autism, the mean score was 3.81 ($SD = 0.38$). This result indicated that the study participants had favorable attitudes toward children with autism. The correlations among the six perceived antecedent variables and attitude are presented in Table 5. All of the variables were positively correlated to each other. In particular, *learning and volunteer experience* and *perception* were strongly related to all of the antecedent factors and to attitude ($p < .01$). More importantly, attitude was significantly correlated to all of the antecedent variables.

Regression Analyses: Influence of Perceived Antecedents on Attitude

Two multiple regression analyses were performed to examine the influence of perceived antecedent variables on attitudes (See Table 6). In the first regression model, attitude was simultaneously regressed on the six perceived antecedent variables, including *learning & volunteer experience*, *family/friends with autism*, *parental role*, *exposure to children with autism*,

Table 4
Descriptive Statistics: Importance Ranking in Perceived Antecedents

	Perceived Antecedents	Mean	SD
1	Family/friends with Autism	4.65	.67
2	Inclusion Belief	4.54	.66
3	Parental Role	4.52	.66
4	Learning & Volunteer Experience	4.35	.70
5	Exposure to Children with Autism	4.09	.75
6	Mass Media Influence	3.76	.82

Note. N = 195

Table 5
Correlations among Study Variables

Variables	1	2	3	4	5	6	7
1. Family/Friends with Autism	1.000	.535**	.587**	.624**	.426**	.293**	.257**
2. Inclusion Belief		1.000	.555**	.665**	.470**	.309**	.412**

3. Parental Role	1.000	.650**	.484**	.454**	.283**
4. Learn. & Vol. Exp. ^a		1.000	.589**	.485**	.353**
5. Exposure. CWA ^b			1.000	.398**	.223**
6. Media Influence				1.000	.161*
7. Attitude					1.000

Note 1. * $p < .05$, ** $p < .01$

Note 2: ^a Learning and volunteer experience; ^b Exposure to children with autism

mass media influence, and *inclusion belief*. The results indicated that the regression model was significant, $F(6,184) = 6.66, p < .001$, and the six antecedent variables explained 18% of the variance. *Inclusion belief* was found to significantly predict attitude ($\beta = .32, p < .01$).

In the second regression model, attitude was hierarchically regressed on the two demographic variables (gender and age) (Step 1) and the six antecedent factors (Step 2) in order to explore the unique contribution of the antecedent factors. The eight factors jointly explained 24% of the variance in attitude. The results of step 1 indicated that the two independent variables (gender and age) accounted for 10% of the variance ($F(2,184) = 10.48, p < .001$). Gender was found to be a significant predictor of attitude ($\beta = .31, p < .001$). In step 2, the six antecedent factors were entered into the regression equation. The results revealed that the six variables explained a significant amount of variance in attitude ($\Delta R^2 = .14, F(8,184) = 5.24, p < .001$). *Inclusion belief* was the only statistically significant predictor ($\beta = .24, p < .05$). The results of the two regression analyses are presented in Table 6.

Analysis of Variance: Demographic Differences in Attitude

Analysis of variance (ANOVA) showed gender differences in college students' attitudes toward children with autism ($F(1, 187) = 19.97, p < .001$). Female students ($M = 3.93, SD = 0.36$) had more positive attitudes than their male counterparts ($M = 3.70, SD = 0.38$). Regarding ethnicity, ANOVA did not reveal any significant differences in attitude across different ethnic groups ($F(5, 183) = 1.31, p = .263$). However, African Americans and Caucasians were the two largest groups in the sample, and ANOVA revealed the difference in attitude between the two groups. Caucasians ($M = 3.84, SD = 0.39$) had more positive attitudes than African Americans ($M = 3.67, SD = 0.38$), ($F = (1, 172) = 5.832, p = .017$). Concerning student majors, ANOVA yielded significant differences in students' attitudes between students with the special education

Table 6
Results of Regression Analyses

Model 1				Model 2			
	β	ΔR^2	ΔF		β	ΔR^2	ΔF
Step 1		.18	6.66***	Step 1		.10	10.48***
Learn.& Vol. ^a	.15			Gender			
					.31***		
Fam/Fr autism	-.03			Age	.04		
Parental Role	.05						
Exposure ^c	-.01			Step 2		.14	5.24***
Media Infl.	-.04			Learn.& Vol. ^a	.09		

Inclusion Belief	.32**	Fam/Fr autism	.003
		Parental Role Exposure ^c	.10
		Media Influ.	.06
		Inclusion Belief	-.03
			.24*
Overall R ²	.18		.24
Adj. R ²	.16		.21

Note 1. * $p < .05$; ** $p < .01$; *** $p < .001$

Note 2. ^a Learning and volunteer experience; ^b Family/friends with autism; ^c Exposure to children with autism

major and those with a non-special education major ($F(1, 184) = 17.65, p < .001$). Students majoring in special education ($M = 4.00, SD = 0.37$) had more favorable attitudes than non-special education major students ($M = 3.73, SD = 0.36$).

Analysis of Variance: Attitude Differences in Personal Experiences Related to Autism

Personal experiences related to people with autism were found to influence attitudes toward children with autism (see Table 7). Being in same classroom with persons with autism was found to affect college students' attitude toward children with autism ($F(1, 185) = 5.022, p = .026$). Students who were in same classroom with individuals with autism ($M = 3.87, SD = 0.37$) had more positive attitudes than those who were not ($M = 3.75, SD = 0.38$). Teaching experience appeared to affect college students' attitudes. Students who had taught special

Table 7

Mean Attitudes as a Function of Types of Exposure

Type of Exposure	Status	N	M	SD
Being in the same classroom with someone with autism	Yes	92	3.87	.37
	No	94	3.75	.38
Teaching special education classes	Yes	44	3.91	.39
	No	144	3.78	.37
Teaching children with autism	Yes	49	3.95	.39
	No	138	3.76	.37
Participation in education programs about autism	Yes	63	3.91	.35
	No	125	3.76	.39
Learning opportunity about autism in college	Yes	115	3.90	.37
	No	73	3.65	.34
Volunteer work with children with autism	Yes	70	3.90	.37

Note. All non-significant findings from ANOVA analyses were not reported ($p > .05$)

education classes ($M = 3.91$, $SD = 0.39$) reported higher scores on attitudes than those who had not ($M = 3.78$, $SD = 0.37$), ($F(1, 187) = 4.166$, $p = .043$). In addition, students who had previously taught children with autism ($M = 3.95$, $SD = 0.39$) had more favorable attitudes than those who had never done so ($M = 3.76$, $SD = 0.37$), ($F(1, 186) = 9.635$, $p = .002$).

Students' learning and volunteer experiences were found to influence attitudes. Students who participated in education programs about autism ($M = 3.91$, $SD = 0.35$) had more favorable attitudes than those who did not ($M = 3.76$, $SD = 0.39$), ($F(1, 187) = 7.027$, $p = .009$). Students who had the opportunity to learn about autism ($M = 3.90$, $SD = 0.37$) had more positive attitudes than those who did not ($M = 3.65$, $SD = 0.34$), ($F(1, 187) = 21.443$, $p = .000$). Students with volunteer experience working with children with autism ($M = 3.90$, $SD = 0.37$) reported higher scores on attitudes than those who did not have such volunteer experience ($M = 3.75$, $SD = 0.38$), ($F(2, 186) = 3.642$, $p = .028$). However, there was no significant difference in attitude between students who participated in workshops about autism ($M = 3.83$, $SD = 0.38$) and those who did not ($M = 3.80$, $SD = 0.38$), ($F(1, 186) = 0.127$, $p = .722$). In addition, there was no significant difference in attitude between students who had worked for autism programs ($M = 3.84$, $SD = 0.38$), and those who had not ($M = 3.79$, $SD = 0.38$), ($F(2, 187) = 0.589$, $p = .556$).

Discussion

This study was designed to examine perceived antecedents to attitudes toward autism. The six perceived antecedents were identified based on the literature review and factor analysis, which include *learning and volunteer experience*, *family/friends with autism*, *parental role*, *exposure to children with autism*, *mass media influence*, and *inclusion belief* toward autism. Concerning the ranking importance of these antecedent factors, descriptive statistics indicated that having significant others with autism was found to be the most important factor affecting people's attitudes toward autism, while the second important factor was *inclusion belief*, followed by *parental role*, *learning and volunteering experience*, and *exposure to children with autism*. More importantly, the six perceived antecedent factors significantly contributed to the prediction of attitudes toward autism. *Inclusion belief* toward autism was found to be a significant predictor. In addition, gender was found to have a significant effect on attitude toward autism. Regarding demographic differences in attitude, gender, student major, personal learning and volunteer experience were found to influence personal attitudes.

Importance Ranking among Perceived Antecedents

As indicated in Table 3, five out of the six perceived antecedents were found to be important factors affecting person's attitude; all of the average mean scores of the five antecedents were above 4.0 out of 5.0 scale. *Having family/friends with autism* was found to be the most important perceived factor related to attitude toward autism. This finding is consistent with previous research (e.g., Martin, 1974; Nevill & White, 2011; Rosenbaum, Armstrong, & King, 1988; Royal & Roberts, 1987). Based on a sample of 652 college students, Nevill and White (2011) found that students who had a first-degree relative with ASD had more favorable attitudes toward people with ASD than the college students who did not have a person with ASD as a

relative. Rosenbaum et al. (1988) also indicated that people who have friends who have disabilities tend to have more positive attitudes towards disabilities. The significant influence of having family and friends with autism on an individual's attitude can be attributed to the consequence of personal involvement. Thomsen, Borgida, and Lavine (1995) indicated "individuals are said to be personally involved with an issue, event, object, or person to the extent that they care about that entity and perceive it as important" (p. 191). Thomsen and colleagues also pointed out that several empirical studies demonstrated the significant effect of personal involvement on attitude (e.g., Petty & Cacioppo, 1986).

The second important factor was *inclusion belief* toward autism (the sample items: "It is important to provide equal educational opportunity to individuals with disabilities" and "individuals with autism can make significant contribution to society"). Blackwell et al. indicated that belief is one of the factors that influence an individual's attitude toward an object. In addition, Fishbein and Ajzen (1975) pointed out that personal belief can be an important determinant of a person's attitude. The importance of inclusion belief toward people with disabilities among college students was supported by a recent study by Park, Yoh, Choi, and Hums (2009), who conducted a qualitative study on college students' attitudes toward the Paralympic Games, which are the Olympics games for athletes with physical disabilities. The main finding of the study was that more than 90% of the study participants reported that it was important for companies to address people with disabilities, and they recognized the importance of providing equal opportunities for this population.

Parental role was found to be the third important perceived antecedent to attitude. As Dalhouse and Frideres (1996) pointed out, parents can have a significant influence on their children's attitudes toward an object or issue. Bohner and Wänke (2002) indicated that children may acquire their parent's attitudes and prejudices by imitating them. Thus, parents can have a crucial role in developing positive attitude of their children toward children with autism.

Learning and volunteering experience and *exposure to children with autism* appeared to be the fourth and fifth important perceived antecedents, respectively. This result seems to be consistent with findings from previous studies (e.g., Preston & Feinstein, 2004; Erwin, 2001; Fichten, Schipper, & Culter, 2005; McKenna et al., 2001) that have indicated that education and volunteering experience help to create positive attitudes towards people with disabilities. In Erwin's (2001) study, direct experience was found to be one of the predominant factors that affect the formation of attitude. McKenna et al. (2001), in a study on attitude of students enrolled in an Occupational Therapy course, also argued that students can have more positive attitudes towards disability after they entered into their fieldwork and interacted with individuals with disabilities firsthand versus the classroom environment. Direct experiences through learning and volunteering can create an opportunity for individuals to decrease the social distance that they have with individuals with autism and this experience ultimately increases positive attitudes towards autism.

Influence of Perceived Antecedents on Attitudes toward Children with Autism

Inclusion belief was found to be a significant predictor of attitudes toward children with autism. This result is in line with the previous literature on attitude formation. Blackwell et al. (2001) pointed out that personal belief plays a vital role in attitude formation. An individual's belief on

a specific object or issue can be established by his/her knowledge, and people obtain their knowledge from a variety of sources, including family, friends, co-workers, or media (Blackwell et al., 2001). Thus, based on the results of this study, we assumed that *inclusion belief* could be affected by the other five perceived antecedents; *family/friends with autism, parental role, learning and volunteer experience, exposure to children with autism, and mass media*. Indeed, as indicated in Table 6, the correlation analysis revealed that *inclusion belief* had a significantly positive relationship with all of the other antecedents ($p < .01$). Therefore, this finding may imply that there is a causal relationship among the antecedent factors, *inclusion belief*, and *attitude*. *Inclusion belief* might serve as a mediator between the five antecedents and attitude, suggesting that the five perceived antecedents can influence inclusion belief that is supposed to affect attitude (the five perceived antecedents → inclusion belief → attitude).

Demographic Differences in Attitudes toward Children with Autism

Results of this current study indicated gender differences in attitudes indicating female students had more favorable attitudes than their male counterparts. This result is in line with recent studies that examined teachers and pre-service teachers' attitudes toward autism (e.g., Chambres et al., 2008; Park et al., 2010; Park & Chitiyo, 2011). Although there have been inconsistent results regarding gender differences in attitudes towards people with disabilities, a large number of studies have reported higher levels of positive attitudes for females compared with males (e.g., Archie & Sherrill, 1989; Diamond & Hesteness, 1996; Rosenbaum et al., 1988). The higher level of females' attitudes can be explained by differences in empathic tendency between genders. Most studies on empathy have indicated that females score higher on empathy than males (Hoffman, 1977; Lennon & Eisenberg, 1987). In addition, Baron-Cohen (2003) pointed out that women are natural empathizers whereas men are better at systemizing.

Concerning student's major, the results indicated that students majoring in special education had more positive attitudes than non-special education majors. This result was consistent with the result of a recent study by Park et al. (2010) who examined pre-service teachers' attitudes toward children with autism. This result can be explained by the fact that college students majoring in special education, rather than those in other majors, tend to have more contacts with children with autism, and they are also likely to have more extensive learning experiences and training about autism. Thus, due to these reasons, students in special education might have more favorable attitudes (Rosenbaum et al., 1988; Royal & Roberts, 1987). These findings suggest that special education courses or structured learning experiences about autism could help to promote more positive attitude towards children with autism.

Like some previous studies (e.g., Hergenrather & Rhodes, 2007; Park et al., 2010; Rice, 2009), the results of this study also indicate that being in the same classroom with individuals with autism, teaching experiences, and learning and volunteering experiences influenced college students' attitudes toward autism. Students who were in the same classroom with fellow students with autism, and those who had taught a special education class or children with autism had more favorable attitudes than those who had never done so; therefore, if education about autism and direct experience affect attitudes towards children with autism, then educational programs could be set up to promote more positive attitudes. With better education about autism, inclusion of children with autism in regular classroom, and facilitation of more volunteering and service

learning opportunity for students, we can promote more positive attitude about autism and other disabilities.

Theoretical and Practical Implications

The findings of this study have implications on how to address the need for more positive attitudes towards children with autism and other disabilities. This study can contribute to the existing body of the literature on attitude toward autism by exploring antecedents that influence personal attitude toward autism. While a number of studies have been conducted to examine the relationships between personal variables (e.g., demographic and personal educational background) and attitude toward autism, there has been lack of empirical studies that examined antecedents to attitudes toward autism (e.g., Campbell, 2006).

The findings revealed important points that further our understanding of how professional attitudes are formed and maintained, which could assist us in our efforts to promote positive attitudes toward autism. Identifying antecedents that have an effect on attitudes towards children with autism would help to identify strategies to promote positive attitudes among professionals. For example, it might be helpful to provide professionals with information about autism and other disabilities in order to promote better understanding of the disabilities and, therefore, promote more positive attitudes. Awareness of disabilities is particularly necessary for college students so that they can effectively support children with autism and their families. Positive attitudes about children with autism among college students may promote the provision of support and service for the children from those professionals.

Findings of this study also suggested the need to create more opportunities for college students and other professionals to have a direct experience with autism through service learning, volunteering, and networking. Providing information about autism, and opportunities for professionals to be directly or indirectly involved in the intervention of children with autism may promote positive attitudes among the professionals. Based on results of this study, we also suggest that it may be helpful for all general education pre-service teachers to be required to minor in special education. This is because according to current trends general education teachers will likely have a student on the autism spectrum in their classroom at some point in their careers and as more students on the spectrum are going to college and other post-secondary training, general education teachers can make the difference between the students' success or failure in transitioning to post-secondary education and life.

This study is not without limitations. This study is based on a convenience sample of college students attending only one college in a Mid-Western State in the US. This may limit the generalization of the findings. The nature of the curriculum in the college of education at the university may have influenced the outcomes. Readers therefore, need to be cautious in their interpretation of the findings. In spite of these limitations, this study sheds light on factors that may influence professional attitudes towards children with autism. Future research should investigate the extent to which each of the antecedent variables specifically influence professionals' attitudes towards autism.

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***Exploring the Effects of the AutisMate Application on a 12 year-old boy with ASD:
A Case Study***

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Abstract

The study examines the effectiveness of the iPad application *AutisMate* in promoting the modeling of social communication and social interaction skills in a 12 year-old boy with Autism Spectrum Disorder (ASD). The study uses a single-subject, embedded, case study design. It calls attention to the use of assistive technology in school settings for students with Autism Spectrum Disorder. The themes explored are the participant's independence, his social communication skills, and social interaction skills. A late theme was the participant's non-compliant behavior in math class. Researchers found that many factors could have affected the difference on the two measures Gilliam Autism Rating Scale and Social Communication Questionnaire from pre- to post-tests, and further research is needed. There were no conclusive results that *AutisMate* had a relationship with the boy's social interaction and communication skills.

Keywords: assistive technology, autism, ASD, *AutisMate*, social communication

***Exploring the Effects of the AutisMate Application on a 12 year-old boy with ASD:
A Case Study***

Autism Spectrum Disorder (ASD) is an extremely multifaceted brain-based disorder defined by the Individuals with Disabilities Education Act (2004) as a developmental disability that affects a person's verbal and non-verbal communication skills in conjunction with social problems, repetitive activities, and stereotyped movements. The newest guidelines in the DSM-V take Autistic Disorder, Asperger Syndrome, and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) and creates one broad name; Autism Spectrum Disorder (ASD; Saulnier & Ventola, 2012; American Psychological Association, 2013). ASD is most frequently diagnosed before the age of three. While no two children are identical in the symptoms they present, it is clear that the defining issues of ASD include the presence of social deficits, difficulty with social communication, and restricted behaviors (Saulnier & Ventola, 2012).

Use of Technology and Children with Autism Spectrum Disorder

Studies have found that persons who have been diagnosed with ASD have the ability to visually process various types of technology. This is often because the technology is predictable and allows the person with ASD more processing time compared to when they interact with other people around them (Guldborg, 2015). For this reason, technology-based activities often have a

strong appeal to persons with ASD and can come in a variety of forms (Cafiero, 2012). Assistive Technology (AT) can come in low-tech forms such as flashcards or highlighting and high-tech forms such as screen readers or speech-to-text. With the recent marked increase in the use of tablets and iPads, many researchers have found them as a resource that can help the social communication, language, and literacy skills in children with ASD (Trembath. al., 2009; Charlop, Dennis, Carpenter, & Greenberg, 2010; Flanagan, Bouck, & Richardson; Shane et al., 2012). In most cases, the technology has applications that can be downloaded to assist in education (Rodriguez, Strnadova & Cumming, 2013). The devices can also increase participation in classroom activities and help students learn academic skills (King, Thomezcek, Voreis, & Scott, 2014).

Literature shows that video modeling is important for children with ASD to acquire new communication skills whether it is on larger television screens, laptop computers, or a portable technology device such as an iPod, iPad, or tablet (Miltenberger & Charlop, 2015). More specifically, social interactions and communication with others can be modeled to those with ASD using video modeling applications (Cihak, Smith, Cornett, & Coleman, 2012).

AutisMate

AutisMate (2013) is one technology application that aims to help boost the social skills of individuals with ASD. The application teaches individuals with ASD to communicate through learning life skills (Autism Speaks, 2015). Parents, therapists, and/or teachers can create interactive scenes of their own using pictures, videos, and voice recordings. *AutisMate* allows parents to target skills at home and teachers to target skills at school. For example, if a student has a list of chores, he or she sees that each picture or video of the specific chore, such as shredding paper, is on the iPad or tablet. Upon completion of the chores, the student receives reinforcement such as pistachios. The *AutisMate* application cueing helps the student gain independence as they complete tasks with no adult cueing or prompting (*AutisMate*, 2014). This helps build independence in students with ASD using the video modeling from the *AutisMate* application (*AutisMate*, 2014).

As the literature shows, video modeling is important for children with ASD to acquire new communication skills whether it is using large television screens, laptop computers, or a portable technology device such as an iPod, iPad, or tablet (Miltenberger & Charlop, 2015). More specifically, social interactions and communication with others can be modeled to those with ASD using video modeling applications (Cihak, Smith, Cornett & Coleman, 2012). In addition, *AutisMate* can promote social skills including tone, body language, and emotion recognition. Furthermore, the *AutisMate* website (2013) explains that Visual Scene Displays (VSDs) can be more powerful for accessing language and sharing experiences; the VSDs do not require language skills and use simple symbols for communication.

AutisMate is similar to other applications on the market such as *Our Story*. *AutisMate* is open-ended in a way that allows it to be used in many different circumstances, and target specific behaviors (Kucirkova et al., 2014). Teachers can use the video modeling technology to follow the students' sequence of events throughout the day with a specific focus on helping increase social skills and communication (Cafiero, 2012).

The application allows students to add their own pictures, videos, and voice recordings to the application in order to create scenes that promote positive interactions. The photos and videos from the students' environment are useful as they help maintain the routine and familiarity in their day-to-day lives, which is usually a necessity for individuals with ASD (National Autistic Society, 2014). The GPS component on the application provides students with scenes relevant to their current location.

Qualitative research analyzes information conveyed through verbal and behavioral content in natural settings (Lincoln & Guba, 1985). It can capture information about beliefs, feelings, and motivations that underlie behaviors (Crabtree & Miller (1992). There is little qualitative research that has been done within the autistic community (Bolte, 2014). By conducting a single-subject embedded case study design, our goal is to add to this minimal amount of qualitative research on ASD. The current study focuses on technology and the relationship between *AutisMate* and social communication skills in a young boy with ASD. The purpose of this study was to examine the use and effectiveness of the *AutisMate* application. Case study research is not limited to qualitative evidence but also includes quantitative evidence such as descriptive statistics. Because of this, a single-subject embedded case study is relevant to use. Furthermore, an embedded case study design calls for the unit of analysis to be through other methods such as the collection and analysis of quantitative data that complements the overall study (Yin, 2014).

Methodology

The following was a single-subject, embedded, case study, involving the implementation of the application *AutisMate*. The initial study purposively sampled six students from a local independent school district. In order to protect the identities of the participants, the names have been changed. The case study participant has been given the pseudonym William. Teachers completed the Gilliam Autism Rating Scale, 3rd edition (Gilliam, 2013) and the Social Communication Questionnaire (Rutter et al., 2003) in January and May. From these scores, researchers located the student with the most drastic change in scores across the four-month period. These scores were embedded into the study. The case study explored the most positive changes in scores of this student and whether *AutisMate* played a role in the increase in functional communicative behaviors.

Research Design

Qualitative research seeks to gain a deeper understanding of a situation or event by using observation in a natural setting (Creswell, 2013). In accordance with the authors' desire to gain insight into the potential benefits of *AutisMate*, the data were collected in a natural setting, the classroom, and was considered sensitive to the students and teachers involved. Qualitative research is generally based on a human or social problem. With this study, the problem was how one child out of the larger maximum variant group scored so differently on the GARS-3 and SCQ from pre-test to post-test. Specifically, the research design used was a single-subject, embedded, case study. This design integrates both qualitative and quantitative data such that the quantitative data helps enhance the overall qualitative data (Yin, 2014). A case study design helps explore and take a more in-depth look at the situation being researched (Merriam, 1998). According to Scholz and Tietje (2002) the embedded single-subject case study takes the

narrative analysis of the qualitative data and has the quantitative data embedded to help enhance and support the qualitative data.

Sampling

Six students from an independent school district in Central Texas were enrolled using purposive criterion-based sampling with referrals from special education teachers. School personnel chose students who had previously been diagnosed with ASD and who were currently using or had the ability to use an iPad. All students were between the ages 5 and 22 years of age. They were not homogenous and were considered a maximum variant sample. This sampling approach is generally used in qualitative research as it can maximize the chance that there will be increased differences among the sample (Creswell, 2009). No additional benefit or compensation was given. Pseudonyms were used to protect the student's anonymity. The case study participant was chosen because he had access to his own iPad and was having documented behavioral problems prior to the implementation of *AutisMate*. William (the case study) was in the special education classroom for the majority of each school day and had an aide with him at all times.

Case Study Participant

Before the study began, the subject's behavior was examined using behavior reports completed by the previous aide. His behavior was characterized as somewhat abnormal. These behaviors were very physical, such as hitting other children, hitting and scratching his aide, and throwing a variety of items from computers to waste baskets. Some of these behaviors were so extreme that he was referred to the counselor's office or time out room. William's teacher put in place a modified reward/consequence system, ranging from daily to weekly rewards/consequences. He was able to receive a proud face sticker if he met expectations including: a) not arguing with the teacher, b) obeying requests, or c) completing all his work. He was then able to receive rewards using the number of stickers he had accumulated. This strategy worked for a short amount of time and then the fascination for the intervention weakened. William had troubles completing work set by his teacher including tasks that should be simple for him such as adding and subtracting. These tasks were not being completed. Overall, William's grades were suffering, and his behaviors were worrying both the teachers and administration.

Data Collection

Data were collected through a variety of measures. For the quantitative strand, the scores from the Gilliam Autism Rating Scale, GARS-3 (Gilliam, 2013) and Social Communication Questionnaire, SCQ (Rutter et al., 2003) were gathered for both William and a comparative group. Behavior reports for the previous school year were collected from the counselor on campus. The counselor also gave a yearly overview of participant behavior that the former aide had written from the previous year. Interviews with William's teacher and William were conducted approximately one year after the study ended. The interviews took place in the special education classroom with William with his teacher and aide present. Finally, daily behavior checklists from the current school year were obtained from William's special education teacher. He was expected to follow instructions given by all teachers, listen to his teacher, and refrain from classroom chattering. The behavior was given an 'X' on the class period that each behavior was not completed; if he had 100% good behavior (no 'X's) then he would move to the next level the following day and receive reinforcement. All data were considered confidential and were stored in the appropriate manner.

Measures

GARS-3. In order to measure severity of the children's behaviors and overall Autism Index score the Gilliam Autism Rating Scale-3 (GARS-3) was used. In 2013, the GARS-3 was re-created to reflect the current perspectives on ASD in the DSM-V. It is used for people between the ages 3 and 22 years. The GARS-3 was developed by Gilliam (2013) in order to (a) help identify persons who have ASD, (b) assess severity of ASD symptoms, (c) document progress as a consequence of the intervention program, (d) target goals for change and intervention on a student's Individualized Education Plan, and (e) serve as a research tool. The tool consists of 58 items over six subscales. Each item allows respondents to make a selection on a 4-point Likert-type scale with no option for a neutral response. The scores from all subscales are combined and provide a score called the Autism Index. Once the Autism Index has been calculated, it can show the likelihood and severity of the person having ASD.

The subscales are related to the Autism Society of America's (2012) definition of ASD and describe specific, observable, and measurable behaviors. The subscales are: Restrictive/Repetitive Behaviors (measures stereotypical behaviors, routines, or rituals), Social Interaction (measures social behaviors), Social Communication (measures individual's responses to social situations and attempts to understand the intent of social interaction and communication), Emotional Responses (measures extreme emotional responses to everyday situations), Cognitive Style (measures fixated interests, characteristics, cognitive ability), and Maladaptive Speech (measures deficits and peculiarities in verbal communication; Gilliam, 2013). Furthermore, while the subscales aim to measure different characteristics of a person with ASD, they also aim to measure all aspects of behavior to help determine if a person shows signs of ASD. Inter-rater reliability for the GARS-3 exceeded .80 for the intraclass coefficients and .84 for the Autism Indexes. Test-retest reliability coefficients exceeded .80 for the subscales and .90 for the Autism Indexes. According to the Pro-Ed website, new validity studies show that the rest results are valid for a variety of subgroups and general population (Pro-Ed, 2014)

SCQ. In order to evaluate the communication skills and social functioning in children who have or may have ASD, the Social Communication Questionnaire (previously known as the *Autism Screening Questionnaire*) was used (Rutter et al., 2003). The current SCQ helps assess the intervention in place across intervals to ensure that the intervention was working properly. The scale is a 40-item tool usually completed by a parent, caregiver or, teacher in less than 10 minutes. The scale is used for children ages four and above (Rutter et al., 2003). The first item on the measure is used to find whether or not the child is verbal or non-verbal and is not scored. If the child is non-verbal, six items are omitted. When the combined scores are greater than 15, the child would be diagnosed with ASD (Oosterling et al., 2010). However, the SCQ was designed before the most recent DSM was published and does not reflect ASD as one diagnosis that the current DSM V does. The Social Communication Questionnaire has internal consistency scores ranging from .85 to .93 (Rutter, Bailey, & Lord, 2003). Findings of psychometric analyses (Rutter, Bailey, & Lord, 2003) indicate that individual children are reliably measured by the SCQ Total Score and that as a screening questionnaire, the SCQ provides a reasonable index of symptom severity.

Given the relationship between Assistive Technology and communication skills, the research aims to investigate if *AutisMate* is an appropriate tool to help improve the communication skills of children with Autism Spectrum Disorder.

Data Analysis

All students' scores from the GARS-3 (Gilliam, 2013) and the Social Communication Questionnaire (Rutter, et al., 2003) were entered into Microsoft Excel to find the averages and compare scores. These were the scores initially documented in the pilot study. The data entry found that William was the most deviant case. His scores on the GARS-3 (Gilliam, 2013) and SCQ (Rutter et al., 2003) were compared to the overall group and embedded in the narrative analysis to help explain and support the phenomena.

Results

William is a white male who, at the start of this research, was in the 5th grade at a local public school in Central Texas. In the early school years, his aide recalls that he was compliant and obedient. However, in the current year, there is documentation of William's first incident report. The report was from the school bus driver and aide, who stated that William had disobeyed his aide's instruction. Following this, there were three other incident reports documented. Two of these reports were a refusal to do work in math. The last report was of physical aggression toward another student in Physical Education. William was placed in the behavioral classroom. A follow up interview was recorded. In the 6th grade, the student was preparing to move to the local middle school. His behavior had dramatically improved from the previous year, according to his Special Education teacher, and he was in majority General Education classes.

Analysis

The initial analysis of the data was conducted by reading through the information that had been gathered, and the interviews with the teachers and aides. The process allowed any potential themes to stand out and be used at a later point in the data analysis. The guiding question throughout the study was: Why did William's scores on the Gilliam Autism Rating Scale (Gilliam, 2014) and Social Communication Questionnaire (Rutter, Bailey & Lord, 2003) change so drastically? Did *AutisMate* play a role in this? The main themes that were discussed throughout the interviews centered on William's independence, social communication skills, and social interaction skills. Furthermore, how had these themes developed since *AutisMate* was introduced?

The data were collected from two primary sources, archival information and the interviews with William, his aide, and special education teacher. Archival information included referral feedback forms, previous overviews from William's aide at the time, and daily checklists. To assist with assessing the quality and rigor of the research analysis, Lincoln and Guba (1985) proposed an emphasis on: Credibility, Transferability, Dependability, and Confirmability. Creswell and Miller (2000) further built on these four criteria and created eight procedures that are employed for different types of qualitative research. The verification procedures include: prolonged engagement and persistent observation, triangulation, peer review, negative case analysis, clarifying researcher bias, member checks, thick description, and external audits. When writing

case studies, triangulation and member checking are the two procedures recommended (Anfara, Jr, Brown, Mangione, 2002).

Triangulation involves the researcher finding a theme in the different sources of data and using it as evidence to prove validity in their findings (Creswell, 2013). To assess credibility and confirmability, prolonged engagement was employed, as this study was ongoing over a few years. Findings are triangulated; shown through multiple sources of data, including interviews, daily behavior checklists, discipline reports, and behavior overview. For transferability, researchers used purposeful sampling and provided a thick description of the data. Dependability also relies on triangulation and peer examination. To help with the analysis of the data, it was organized by research question.

There was a common theme that developed throughout the qualitative data gathered. William was most disruptive in math class. In fact, out of the four incident reports of the year prior to data collection, 50% were from math class. The aide explained she believed William was “feeling frustrated because he was unable to communicate.”

The behavior checklists were introduced three months after the implementation of *AutisMate*. They were created to document whether William was meeting his goals for each class period and to document specifics of behavioral observations. Some examples of the goals were: follow instructions given by all teachers, listen to teacher, and refrain from classroom chattering. William would receive an ‘X’ if the goal was not met; a percentage was then created at the end of the day to show the number of good behaviors for that day. Figure 1 below shows that William’s behavior slowly became better toward the end of May and the beginning of June. However, it was still erratic during the middle of May, and at the end of the *AutisMate* implementation period. Figure 1 also shows that William was following directions 50% or more of the time for 23 days out of the 38 days he was in the behavior classroom.

Figure 1

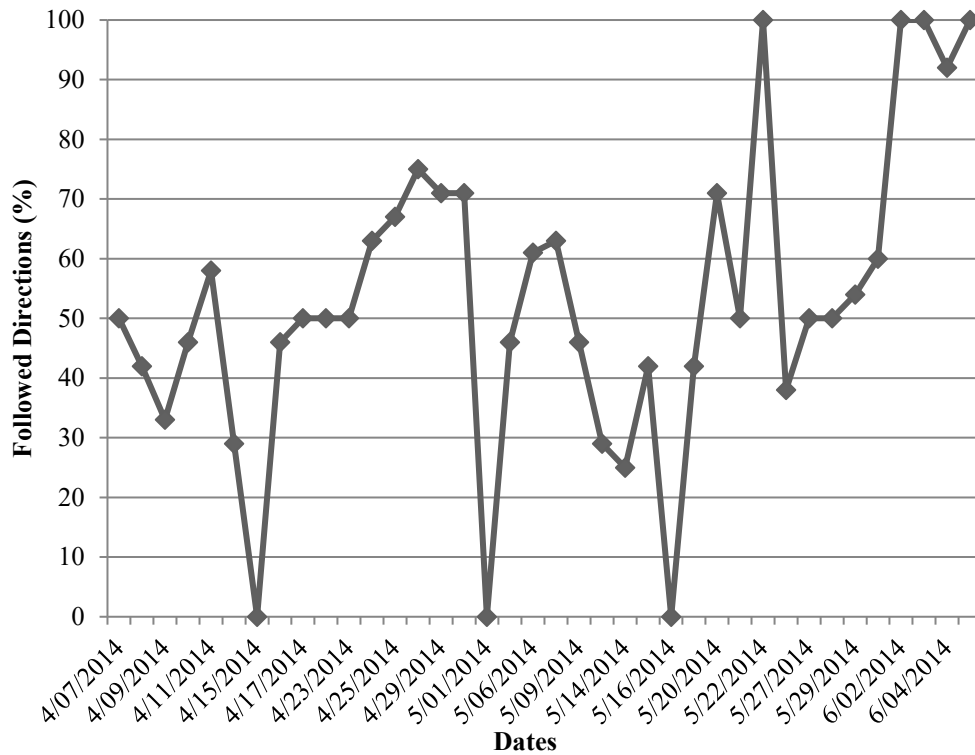


Figure 1. Percentage (%) of Directions Followed Between April and June, 2014

When the researchers asked semi-structured interview questions to help initiate the conversation about William’s communicative behavior prior to *AutisMate* being introduced, the interviewee explained, “If he did use his words they were not so nice... They were cuss words... [He was] frustrated... Not being able to communicate what he wanted to say.” Since *AutisMate* was introduced, the researchers asked what had changed. It was revealed that he asked to go to the restroom and his behavior was more independent. In addition, the interviewee stated “*AutisMate* helped breakdown [William’s day] and create a routine that he could check off.” Another common theme throughout the interview was the routine that William was able to abide by and check off was not dependent upon being in the classroom. *AutisMate* helped William in other locations as well. For example, on the bus or in the cafeteria at lunch.

The researchers wanted to determine how William was with initiating conversations after the implementation of *AutisMate*. This produced further information regarding his communication skills in 2015. William’s aide revealed William would only initiate conversation when he needed something. However, as the discussion continued, his Special Education teacher mentioned that William would ask a question with the intention that you will pair it back with a question, so he can initiate the conversation or give the answer. The researchers noticed this when he asked, “What is a goal?” the aide replied, “What is a goal?” To which William replied “It is a thing that soccer balls go in.” Throughout the interview William was sitting by the researchers, his aide, and his teacher. He was initiating conversation about how his teacher had previously explained

and told the researchers information about games he liked on the iPad and the Air Buddy Disney movies.

Table 1 shows that William’s Social Communication and Maladaptive Speech decreased in the post-test compared to the overall group. Researchers view these as positive improvements for William as it shows his responses to social situations had increased. Table 2 shows that William’s scores on the Social Communication Questionnaire post-test decreased more in comparison to the overall group. This indicates that William responded in a positive way and the intervention was effective.

Table 1
Pre and Post Scores from the Gilliam Autism Rating Scale

Name	R.B		S.I		S.C		E.R		C.S		M.S		Autism Index		Percentile Ranking	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Cole	14	15	12	13	12	12	13	8	11	5	13	10	122	105	93	63
Joe	13	14	14	12	12	12	13	14	5	5	10	11	111	112	77	79
Mark	7	8	9	8	8	8	7	10	11	11	12	11	92	94	30	35
Taylor	7	5	5	3	7	8	5	4	13	14	9	9	80	75	9	5
Tom	11	8	13	13	12	12	13	10	0	0	0	0	116	106	86	65
William	14	7	13	10	11	9	12	8	13	11	17	13	130	97	98	42
Average	10.4	10	10.6	9.8	10.2	10.4	10.2	9.2	8	7	8.8	8.2	104.2	98.4	59	59

Note: R.B – Restricted Behavior, S.I – Social Interaction, S.C – Social Communication, E.R – Emotional Responses, C.S – Cognitive Style, M.S – Maladaptive Speech

The second research question focused on the application and how it helped promote social skills for William. When the researchers asked about friendship groups or anyone specifically with whom William is a friend, William’s aide explained he has one person whom William would consider a friend. The individual “knows how to communicate with William, and [the individual] works well with him.” When the researchers wanted to know more about how specifically the application had helped William with his socialization skills, his teacher described that “*AutisMate* showed the picture of what to do and he was able to check it off [upon completion].” The aide added to that, explaining William’s behavior had become more independent, even requesting to go to the restroom and going alone.

William had also shown improvement through taking initiative when joining others for group work. “He doesn’t need to be prompted to join groups for group work”, explained the teacher. As the discussion continued, the aide told the researchers how William would join the other 6th graders for lunch. The teacher mentioned that William had recently been walking between two teachers and knew to say, “Pardon me” when walking by them. The aide said that *AutisMate* helped with the routine of William’s day. William’s independence increased as he relied less on adult prompting and cueing and more on the *AutisMate* cueing. Furthermore, William’s score for Social Interaction shown in Table 1 decreased the most in comparison to the overall group, and in Table 2, his score on the Social Communication Questionnaire decreased more than the overall group.

Table 2
Pre and Post Scores from the Social Communication Questionnaire

Name	Pre	Post
Cole	28	30
Joe	23	16
Mark	19	11
Taylor	0	8
Tom	25	23
William	28	18
Average	19	17.6

In addition to the two research questions, analysis of the data led to a serendipitous finding. One theme that emerged was the relationship between William's non-compliant behavior and math. Evidence came from the interview, behavior overview from the aide, and daily behavior checklists. While the researchers did find that William had shown improvements with both his social communication and social interaction skills, the relationship between *AutisMate* and these social skills is not clear. Furthermore, there are many variables to consider besides *AutisMate*. These variables include the aide from the previous school years left, the fact that William was moved into the behavior classroom in April 2014, many of his non-compliant behaviors were from Math class, and possibly, the beginning stages of puberty. *AutisMate* appeared to improve his social and communication skills and was considered an effective intervention for William.

Discussion

The first research question focused on Assistive Technology (AT) and if there was a relationship between *AutisMate* and William's social communication skills. Throughout the interviews, researchers found that *AutisMate* helped William become more independent. Comments included: "[*AutisMate*] helped [William] with his routine... it broke down the routine and he was able to check off the activities." While this is not necessarily a social communication skill, it does allow William to function more easily in the general education classroom as he is less reliant on his teacher and aide. At the time of the interview, William was using his iPad as a reinforcer throughout the day, but the aide explained, "He has no scheduling or reward system in place, he knows his own schedule." Both interviewees saw the lack of scheduling or reward schedule to be positive in comparison to where William had been the year prior. William still needed help with his social communication initiation skills. Therefore, there were no conclusive results from the interview showing that *AutisMate* and social communication skills had a relationship.

The second research question looked at whether *AutisMate* promoted modeling social skills to William. Both interviewees discussed how in the current school year, William had become more open to joining groups. The teacher said, "He is not prompted to participate and has become more social in his [general education] classes." The researchers also found that William will eat with the other 6th grade students on a daily basis in the cafeteria, and has one student whom he would call a friend. However, neither seemed to be linked to *AutisMate*. Both teacher and aide believed that it was because he had started to join more general education classes. The teacher explained, in William's classes, he "raises his hand if he has a question." However, it is also unknown if *AutisMate* played a role in helping this behavior begin or if he had modeled it from other students in the class. While there did seem to be an improvement in behavior overall, the results show that there was no functional relationship between the application and social communication or social interaction skills. The researchers found no conclusive results to why William's scores changed on both the GARS and the SCQ even though there was a difference between his scores and the overall group. Researchers could assume that it was due to varying factors which might include the following: 1) the campus and school context, 2) William's relationship with the aide, 3) the amount of time spent in general education classrooms, 4) *AutisMate* and the tasks William was required to complete or the videos and pictures that had

been used to teach William, and 5) puberty. William was placed in the behavior classroom in April, close to the end of the research period. Therefore, when his teacher first completed the GARS and SCQ in January, she could have been basing it off his non-compliant behaviors within that particular time period. Close to 5 months later, William had been in the behavior classroom for over a month. This could have affected his scores on the final GARS and SCQ.

Furthermore, many of William's non-compliant behaviors that were recorded came from his math class. Those interviewed mentioned that, "math is the most challenging." However, there was no mention that William had received extra help in this area with regard to tutoring or using *AutisMate* to increase compliant behaviors in class. William was disrespectful toward the aide, showing physical aggression multiple times, and was noncompliant when she asked him to complete particular tasks. *AutisMate* was not used in this situation to help decrease the noncompliant behavior.

Research has shown that video modeling on tablets and iPads can lead to independence as it teaches skills that focus directly on the relevant information the student with ASD should learn. Video based instruction has been shown to be effective and is frequently used with additional response prompting systems (Bennett et al., 2017). William's aide explained in the interview that William "got the hang of [his routine], and stopped using [the application]." It has been found that visual schedules on iPods allow predictability and sequence day-to-day tasks (Milley & Machailicek, 2012). However, while the ultimate goal is to have the student be less reliant on prompts from the teacher, video modeling on such applications like *AutisMate* can continually be used to help target other behaviors such as task engagement or challenging behaviors.

Findings in this study do not necessarily indicate that *AutisMate* might change verbal behavior. However, the teacher's aide felt the *AutisMate* application is excellent for students who may be non-verbal or need help with their communication skills such as William did. The aide appreciated how the pictures and videos were of "real things" in the student's environment, and were "not generic, like the Board Maker application".

Puberty is a factor that could have played another role in the non-compliant behavior. According to Zacharin (2009) the onset of puberty in normal developing boys is between 9 to 14 years old. Often, when there is a disturbance of brain function puberty can start earlier, however, it is less likely to occur in boys. William was 12 years old while the study was being conducted, and that age would have put him right in the midst of starting stages of puberty. Research shows that comorbid behaviors such as irritability and hyperactivity are usually evident in people with ASD during adolescence but have been found to decrease in adulthood (Anderson, Maye & Lord, 2011). Furthermore, the development of social skills increases in youth with ASD however, youth with ASD may be slower when compared to typically developing children of the same age (Anderson, Maye, & Lord, 2011). This is why further research is needed on how we can help provide support for social communication skill development in children with ASD.

Last, the research conducted both in the initial study and the follow-up case study would help lead a larger project for future research. An example could be using *AutisMate* for targeting specific behaviors, using Applied Behavior Analysis in a controlled home or school environment. The limitations, such as the relationship between William and his aide, his move to

the behavior classroom toward the end of the study, and puberty are all elements that were difficult to control. However, William's lack of compliant behavior in math and the lack of behavioral checklists early on in the study could have been controlled for.

The findings of this study were context-dependent; it is difficult to generalize the findings to a larger group when the sample size was small. Case studies are used when studying a new or contemporary issue in a real life context (Yin, 2003). The researchers offered evidence that applications such as *AutisMate* can be a valuable part of helping students with ASD become more independent when transitioning to a general education classroom. Future research is needed to control conditions where the application is used to help determine if it could help in a specific situation. Furthermore, future research should focus on a larger group of special education students to see how the app helps students who have transitioned

This study examined the effectiveness of the iPad application *AutisMate* in promoting the modeling of social communication and social interaction skills. It used a single-subject, embedded, case study design. Assistive technology in school settings for students with Autism Spectrum Disorder can be effective. However, there were no conclusive results that *AutisMate* had a relationship with William's social interaction and communication skills in this particular case. The themes explored are the participant's independence, his social communication skills, and social interaction skills. A late theme was the participant's non-compliant behavior in math class. Researchers found that many factors could have affected the difference on the two measures Gilliam Autism Rating Scale and Social Communication Questionnaire from pre- to post-tests, and further research is needed. Utilizing applications on iPads and other forms of technology may not lead to what the application claims, however, further research on a large sample size is needed to ensure that William is not the outlier for the use of this particular application.

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Addressing the Need for Progress in Special Education: Understanding Endrew F. and the Role of Special Educators

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Abstract

The Supreme Court case of *Endrew F. v. Douglas County District RE-1* (2017) has renewed interest in the Free and Appropriate Public Education (FAPE) mandate of the Individuals with Disabilities Act (IDEA). The court's ruling expands the term "appropriate" to a consideration of progress for academics and behavior. This shift has significance to many who work with students with disabilities in schools. Specifically, special educators will need to ensure that they are assessing and monitoring academics and behavioral, such as incorporating functional behavior assessments (FBAs) into the development of appropriate behavior intervention plans (BIPs) and considering overall progress during Individualized Education Programs (IEP) development. This paper will address the history of IDEA, its connection with FAPE, and discuss the seminal cases of *Rowley* and *Endrew F.* and their implications for IEP teams. Considerations and recommendations for addressing FAPE for students will be provided, focusing on implications for the IEP, Multi-tiered Systems of Support (MTSS), and Behavior Intervention Plans (BIPs).

Keywords: *Endrew F.*, IDEA, FAPE, behavior intervention plan, MTSS, IEP, special educators

Addressing the Need for Progress in Special Education: Understanding Endrew F. and the Role of Special Educators

The history of students with disabilities in public education has not been a tale of smooth sailing but rather a turbulent journey through choppy water. Often, such students were excluded from full participation in education, with limited interaction with their peers without disabilities. Compulsory attendance laws in the 1800s through the turn of the century were extended to most students including immigrants and the poor, resulting in the inclusion of individuals with diverse backgrounds in mass learning; yet, students with physical or mental disabilities remained excluded. These students were not compelled to attend schools (Katz, 1976) and if they did seek education, were taught at home or other exclusionary settings (Wright & Wright, 2007). Eventually, physical and mental examinations became required in the schools, and students with disabilities continued to remain excluded, attending separate schools or classes that focused on technical skills (Spaulding & Pratt, 2015). Some state statutes excluded such students from education if considered "uneducable," which was tied to a determination that they had not reached beyond the mental age of five (e.g., Pennsylvania; Koseki, 2017), and if it was "...believed that the child would not benefit from education or if the child's presence would be disruptive to others" (Wright & Wright, 2007, p. 8). Historically, students with disabilities were

excluded from public schools and if they were afforded the opportunity, the education provided was not necessarily “appropriate” (Yell, Katsiyannis, & Hazelkorn, 2007). In these early days, teachers were often involved in determining if a student could be included in schools with their peers.

Seminal Court Cases

In the 1950s, the civil rights of students to attend public school were litigated in *Brown v. Board of Education* (1954). In that case, the court ruled that segregation of children (in this case, African Americans) on the basis of race was a violation of the U.S. Constitution and that these children had the right to a public education. However, this case did not apply to students with disabilities. It was not until the 1970s in the seminal cases of *Pennsylvania Association for Retarded Children v. Commonwealth* (1971; *P.A.R.C.*) and *Mills v. Board of Education of District of Columbia* (1972) that the education of students with disabilities was addressed, initiating the need for those with expertise to support these students and their teachers. These cases established the precedence of including students with disabilities in public education in conjunction with findings that students with severe disabilities could be educated effectively (Hargrove et al., 1983), suggesting that there would be a benefit for students with even the most severe disabilities to receive a public education.

Statutory Authority

Despite strong legal and initial research support, students with disabilities still remained excluded (Yell, Rogers, & Rogers, 1998), and the need to establish clear laws that supported the right for students with disabilities to be educated in public schools was essential. Parent, teacher, and administrator organizations (e.g., Association for Persons with Severe Handicaps, National Association for Retarded Citizens (ARC); Council for Exceptional Children) joined together to promote the education of students with disabilities in the public school. Congress ultimately passed a law and in 1975, President Ford signed the Education for All Handicapped Children Act, the precursor to the Individuals with Disabilities Act (IDEA). The law and subsequent related regulations included several provisions, such as procedural safeguards (e.g., notice, consent), evaluation and the concepts of a Least Restrictive Environment (LRE; educational environment in which a student would be educated), and Free Appropriate Public Education (FAPE; how a student would be educated). Of the provisions, FAPE was considered the “cornerstone” of IDEA for students with disabilities (Zirkel, 2013, p. 497) and began to allow children with disabilities to attend public school with their peers without disabilities. This also triggered the need for specialized teachers in “special education” to assist in the selection and placement of students in these specialized services and in the determination of what the appropriate services would encompass.

Statutory Language of FAPE

Under IDEA, special education is defined as, “specially designed instruction, at no charge to the parents or guardians, to meet the unique needs of a child with a disability” (IDEA, 20 U.S.C. § 404[a][16]) and includes the provision of related services (e.g., transportation, occupational therapy) up until graduation or their 22nd birthday. In general, FAPE addresses the cost (free), the nature (public), and the how (appropriate education) that is intertwined with providing special education. Statutorily, the words of FAPE were written as follows in IDEA (20 U.S.C. §1401(9)):

Free appropriate public education. The term “free appropriate public education” means special education and related services that—

- (A) have been provided at public expense, under public supervision and direction, and without charge;
- (B) meet the standards of the state educational agency;
- (C) include an appropriate preschool, elementary school, or secondary school education in the state involved; and
- (D) are provided in conformity with the individualized education program required under §1414(d) of this title.

Although some of the terms of FAPE might seem clear, the term “appropriate” was murky. The statutory language specified clear procedures (such as the development of an IEP), but neglected the more substantive aspects of what FAPE actually constituted, such as a certain level of education (e.g., grade level in reading; Yell, Katsiyannis, & Hazelkorn, 2007). In addition, as FAPE depends on the individual’s circumstance, it allowed different perspectives on what was appropriate that might not align. For example, schools and parents might have different ideas of what was appropriate for the same student. After the passage of IDEA, litigation included questions on FAPE, and these issues often looked at the interpretation of what would be considered “appropriate.” The case of *Rowley* included such a query.

***Rowley* (1982)**

In the *Board of Education of the Hendrick Hudson School District v. Rowley* (*Rowley*), Amy Rowley was a student who was deaf in a general education elementary school classroom. The school had initially offered the use of an FM wireless hearing system and a sign language interpreter in kindergarten; however, the interpreter was removed after two weeks because Amy did not appear to need this service. Since Amy continued to do very well academically compared to other students, the school again decided she did not need an interpreter the following year. Her parents argued that she would achieve more with the interpreter and filed a lawsuit alleging a violation of FAPE. Ultimately when the case went to the Supreme Court, the justices considered the question of “What is meant by the Act’s requirement of a “free appropriate public education?” (*Rowley*, 1982, p. 186). The decision discussed the importance of complying with procedural law and that the intent of the statute was not to establish a substantive level of an educational benefit (*Rowley*, 1982, p. 189-190). Justice Rehnquist wrote: “Thus, the intent of the Act was more to open the door of public education to handicapped children on appropriate terms than to guarantee any level of education once inside” (*Rowley*, 1982, 192). The Court rejected the argument for “equal educational opportunity” (*Rowley*, 1982, p. 198), instead focusing on the idea of “some educational benefit” (*Rowley*, 1982, p. 200) and remanded the case to the lower court for decision.

Most importantly to subsequent decisions, *Rowley* contained a two-part test that was not meant to be a bright-line test, but more a way to consider each student’s needs: “First, has the State complied with the procedures set forth in the Act? And second, is the individualized educational program developed through the Act’s procedures reasonably calculated to enable the child to receive educational benefits?” (*Rowley*, 1982, p. 206-207). In practice, this ended up being used as a bright-line test, becoming the basis for schools to use when considering FAPE. In order to violate the first part, the school must have made a procedural violation. For example, failing to

provide notice for a meeting meant that parents were unable to participate or the general education classroom teacher was not included in the IEP planning. As for the second part, schools must provide “some educational benefit,” yet; the level was not made specific and required a case-by-case determination. It is notable that Amy Rowley was considered more advanced than other students academically and not considered a behavioral distraction, as would be the case with *Andrew F.* when the FAPE standard was revisited. For *Rowley*, the court ruled that the school provided FAPE because there was not a procedural violation, and she had received an educational benefit without the provision of a sign language interpreter.

Subsequent Cases and Standards

After *Rowley*, there was still ambiguity in how to interpret what was meant by “reasonably calculated” and to what degree of benefit “some educational benefit” would entail, especially as *Rowley* had suggested that FAPE needed to be determined on a case-by-case basis. This uncertainty initiated and continued to lead to lawsuits on whether an education offered to a student with disability violated FAPE, with many of the arguments centered again on setting a level for “educational benefit.” For instance, in *Hall v. Vance County Board of Education* (1985), the Court indicated that the school needed to provide a “serviceable Chevrolet rather than a Cadillac” when discussing the continuum of education benefit (p. 459-460). *Timothy W. v. Rochester School District* (1989) added that benefits of FAPE extended beyond academic to include functional (e.g., behavioral) education. *J. C. v. Central Regional* (1996) ruled that there had to be more than a *de minimis* (i.e., trivial or minor) educational benefit. In short, there were several standards of educational benefits suggested by different courts across more than three decades on what constituted FAPE, and special educators have had to adjust their assessment, data monitoring and support provided to an IEP team based on the most recent court rulings to maintain compliance.

While the question of educational benefit continued in the courts, changes were made to the IDEA statute itself that implied that the standard of FAPE might need to focus on higher expectations for students with disabilities (Zirkel, 2013), and thus the movement of results-driven language became commonplace. For example, the 1997 amendments to IDEA included provisions that an IEP has to have measurable goals and that students with disabilities should be included in statewide assessments, and the 2004 amendments included an emphasis on “results” that incorporated the use of peer-reviewed research in determining programming (Yell, Katsiyannis, & Hazelkorn, 2007). In addition, violations of FAPE would not prevail unless the procedural violations impacted more substantive violations such as the right to FAPE, denied parent participation in the delivery of FAPE, or led to the loss of educational benefits (Yell & Bateman, 2017; IDEA, U.S.C. §1415(f)(3)(iii)). This “harmless error approach” (Zirkel, 2013) eroded the original intent of the statute’s importance of procedure and made it more important to consider a more unified standard for FAPE.

As the years progressed, circuit courts determined that there were different ways of interpreting the meaning of benefit under FAPE (Yell & Bateman, 2017). Some Circuit Courts followed a higher standard seemingly connected to a “meaningful benefit” (3rd, 6th, 5th Circuit Courts), others adopted a “slightly more than trivial or *de minimis*” (2nd, 4th, 7th, 8th, 10th, & 11th Circuit Courts), had no clear standard (1st Circuit), or had a mixed one (9th Circuit; Yell & Bateman, 2017). This split in the courts meant that a student who was educated in one state might receive

different special education services if they crossed into another jurisdiction (i.e., circuit court area) that used a different standard. Success for a lawsuit could then depend on where the student was living and what standard was being applied, and one such example of variation in circuit court rulings was the case of *Andrew F.*

Andrew F. v. Douglas County District RE-1 (2017; Andrew F.)

Andrew was receiving special education for autism and had been provided an IEP. He also had a diagnosis of ADHD. Based on teacher accounts, the court reported that he would “scream in class, climb over furniture and other students, and occasionally run away from school...He was afflicted by severe fears of common-place things like flies, spills and public restrooms” (*Andrew F.*, 2017, p. 7). When his IEP did not change in 4th grade and Andrew showed a lack of progress, his parents enrolled him in a private school that provided increased academic goals and a behavioral intervention plan. Andrew’s behavior improved, which allowed him to make academic gains and encouraged his parents to re-enroll him in the public school. When the proposed IEP at the public school failed to address his behavior, his parents maintained his placement at the private school and sought compensation for school tuition from the district for denial of FAPE. After the Administrative Court (due process) and District Court, determined that Andrew had received a benefit, the Appellate Court reaffirmed the lower courts, finding that Andrew was receiving “some educational benefit” with the public school IEP that they declared as merely more than *de minimis*. His parents then appealed to the Supreme Court which in 2017 granted *certiorari* (i.e., decided to hear the case) on the issue of the level of educational benefit that school districts must confer on children with disabilities to provide them with the free appropriate public education guaranteed by the Individuals with Disabilities Education Act, 20 U.S.C. §§ 1400 et seq. (U.S. Supreme Court, 2016).

Arguments

There were three main arguments for different standards at the Supreme Court hearing. Neal Katyal, the attorney for the school district, argued the term “some benefit” which he equated with more than *de minimis* (U.S. Supreme Court, 2017, p. 40). The attorney for the student and parents, Jeffrey Fisher, argued for “substantially equal opportunity,” which was a much higher benefit (U.S. Supreme Court, 2017, p. 3) tied with the provision of the same benefits provided to students without disabilities. Finally, Irv Gornstein, a Counselor to the Solicitor General for the United States Department of Justice suggested that there should be significant progress toward grade-level standards if possible (U.S. Supreme Court, 2017, p. 25); and regardless, should be reasonably calculated to make progress that is appropriate in light of the child’s circumstances. This latter part referred to the original main ruling (the holding) from *Rowley* (U.S. Supreme Court, 2007, p. 24).

Court Questions

The Supreme Court justices asked many questions of the attorneys and their responses highlighted the ambiguity existing in the current law. For example, Justice Breyer questioned the attorney for the school on how he would look at what is meant by “some benefit:”

Mr. Katyal: “Some benefit.”

Justice Breyer: “You could say some benefit or you could say some benefit.”

Mr. Katyal: “Yeah.”

Justice Breyer. “All right. Now that’s an ambiguity.”

Mr. Katyal. “Yes” (U. S. Supreme Court, 2017, p. 45).

Justice Alito also had some queries on what was meant and linked it to the idea of progress:

Justice Alito: “Read them literally, it’s not clear to me that they mean anything different. Now, ‘progress’ benefit. Yeah, I don’t see how you can have a benefit unless you’re making some progress” (U. S. Supreme Court, 2017, p. 47).

Chief Justice Roberts also looked at what was meant by “meaningful:”

“Significant - ‘significant,’ ‘meaningful.’ Whatever. It’s more than simply *de minimis*. It suggests that you can’t just look at something and say, aha. Here, that was helpful, that was helpful, because it’s—the whole package has got to be helpful enough to allow the student to keep up with his peers” (U. S. Supreme Court, 2017, p. 49).

Ruling

Ultimately, in *Endrew F.* the U. S. Supreme Court reaffirmed the language from *Rowley* that a student’s education must be “reasonably calculated” but expanded it to specifically consider progress. The ruling stated, “To meet its substantive obligation under IDEA, a school must offer an IEP reasonably calculated to enable a child to make progress appropriate in light of the child’s circumstances” (*Endrew F.*, 2017, p. 11). The court rejected the idea that “some benefit” was equivalent to “merely more than *de minimis*,” (*Endrew F.*, 2017, p. 14) and acknowledged that cases must be decided considering the “unique circumstances of the child” rather than a “bright-line rule” (*Endrew F.*, 2017, p. 15-16). The court also rejected the substantially equal argument put forth by the attorney for the parents (*Endrew F.*, 2017, p. 15); an argument for equal opportunities provided to students with and without disabilities. The Court acknowledged that while there was a range of needs for students with disabilities and for students who are fully integrated in classrooms, there must be a consideration of progress in the grade level curriculum to “achieve advancement from grade to grade” (*Endrew F.*, 2017, p. 13). For students who are not fully integrated, the educational program must be “appropriately ambitious in light of his circumstances” (*Endrew F.*, 2017, p. 14). The Court suggested that, “A substantive standard not focused on student progress would do little to remedy the pervasive and tragic academic stagnation that prompted Congress to act” (*Endrew F.*, 2017, p. 11). The court was remanded (e.g., sent back to the lower level court) with the new standard to determine if Endrew had received FAPE. Ultimately, the lower Circuit Court used the new standard and decided that there was now a violation of FAPE with Endrew’s family being awarded reimbursement for tuition and other costs (e.g., “reasonable attorney fees;” *Endrew F.*, 2018, p. 22).

Implications for Special Educators

Special educators are essential members of schools and IEP teams that support both the ability of students' learning and educators' teaching. They apply their expertise in assessment, curriculum, and interventions to ensure student success academically, socially, behaviorally, and emotionally. The case of *Endrew F.* and its interpretation of FAPE have several implications for special educators as they partner with families, teachers, administrators, and other professionals to create safe, healthy, and supportive learning environments that strengthen connections between the home, school, and community. In particular, special educators should be fully

aware of the central issues surrounding *Endrew F.* and the change in redefining “appropriate” for FAPE. Of particular importance is the word “progress” which exceeds previous legal cases that focused on benefit. This has implications for evaluation, such as examining what a student might be able to learn and considering how to measure that learning. Therefore, implementing appropriate interventions must be derived from an accurate assessment to allow for explicit measurement of “progress” specific to a student’s circumstances. Due to *Endrew F.*, special educators must be keenly aware of the overall considerations involving the new change in standard and its impact on the state where they work, and consider how to address student progress appropriately to both maintain the IEP team in compliance with the law and ensure that student goals are results-driven.

Change in Standard

As *Endrew F.* has shifted the consideration of FAPE from benefit to progress and rejected the “*de minimis*” standard, this will result in changing standards across several states. In essence, the Circuit Courts that followed the original benefit and *de minimis* standard will likely need to adjust and reflect the higher standard, and most likely affecting the following states that followed the lower standard: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Minnesota, Missouri, Montana, Nebraska, New Hampshire, Nevada, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin and Wyoming (Yell & Bateman, 2017). For special educators in those states, practices that have previously met FAPE may need to be reconsidered. For example, when the case was sent back to the lower court from the Supreme Court with the new standard, the lower court decided that there was not enough benefit for *Endrew F.* and that there was a denial of FAPE (*Endrew F.*, 2018). In order to show a benefit, progress needed to be made for both academic and functional or behavioral goals, which could mean that a special educator would be involved in the assessment for and development of result-driven individual goals of a student’s IEP measuring progress and benefit. For the other states that had followed a higher standard, care should still be given to ensure IEP’s are following the *Endrew F.* connections to student progress and maintaining the measurement of progress across special education programs.

Again, the *Endrew F.* ruling mirrored some of the language of *Rowley* but shifted the focus by changing the wording from “benefit” to “progress.” As Turnbull, Turnbull, and Cooper (2018) wrote, “It is *Rowley*-plus, a beefed-up middle path” (p. 126). As *Rowley* was not overturned, schools are still required to continue to consider of *Rowley*’s first part emphasis on complying with procedure, such as ensuring parents are invited to an IEP meeting. However, more of the change comes with the second part (Yell & Bateman, 2017). For *Rowley*, the test is: “...is the individualized educational program developed through the Act’s procedures reasonably calculated to enable the child to receive educational benefits?” (*Rowley*, 1982, p. 206-207). For the new standard under *Endrew F.*, the test is “To meet its substantive obligation under IDEA, a school must offer an IEP reasonably calculated to enable a child to make progress appropriate in light of the child’s circumstances” (*Endrew F.*, 2017, p. 11). The *Endrew F.* standard focuses its benefit on measuring progress based on the unique circumstances of the student and has direct implications for special educators as outlined below.

Appropriately Addressing Progress

In order to help schools interpret the *Andrew F.* ruling, the U.S. Department of Education (U.S. DOE) released a Questions and Answers (Q& A) Memorandum on *Andrew F.* describing the facts of the case, the history of FAPE and *Rowley*, and addressing questions to help states and schools understand the importance of the *Andrew F.* decision and its impact on schools for deciding FAPE (U.S. DOE, 2017). Most importantly the document clarifies that the new substantive standard was higher than the “merely more than *de minimis*” used by several Circuit Courts. As for recommendations, the Q & A Memorandum suggests that the IEP team should “consider the child’s previous rate of academic growth, whether the child is on track to achieve or exceed grade-level proficiency, any behaviors interfering with the child’s progress, and additional information and input provided by the child’s parents” (U.S. DOE, 2017, p. 5) and include a consideration of both academic and behavioral or functional progress which are individually examined and identified by the IEP team. For students with disabilities, this entails establishing measurable academic and functional or behavioral goals that reflect the present levels of academic achievement and behavioral or functional performance, and the use of curricula and strategies that are aligned with state standards (U.S. DOE, 2017). To ensure the goals are appropriately ambitious and match the unique needs of the student, goals should reflect progress in the general education curricula that is consistent for all students.

For students who are more impacted by significant cognitive disabilities, the goals should still be ambitious but can be weighed by the student’s circumstances and connection with Present Levels of Academic Achievement and Functional Performance (PLAPFF), with functional involving a consideration of behavior. (In the past, the PLAPFF was called the Present Levels of Performance (PLOP) but amendments to the IDEA changed the wording to PLAPFF to reflect the importance of considering functional and behavioral goals including academics). In order to ensure adequate monitoring of progress, the Q & A Memorandum suggests that IEP teams meet, examine progress or lack thereof, and change the special education services if progress is not made, still keeping in mind the changes should be appropriately ambitious (U.S. DOE, 2017, p. 8). Overall, the U.S. DOE suggests three key practices for both IEP teams, and the special educators:

1. Identifying present levels of academic achievement and functional performance;
2. The setting of measurable annual goals, including academic and functional goals; and
3. How a child’s progress toward meeting annual goals will be measured and reported so that the *Andrew F.* standard is met for each individual child with a disability (U.S. DOE, 2017, p. 9).

Under the new standard, special educators should help the IEP team ensure that the IEP enables a student to make progress on an educational benefit in accordance to the student’s unique circumstances during assessments, development of the IEP, and ongoing measurement. Further importance, special educators should continue to encourage meaningful parent participation.

Assessment and IEP Development

IDEA contains several provisions that align with assessment and the development of an IEP that directly impacts special educators. While special educators might assist as IEP team's assessment expert in conjunction with school psychologists, they should help in considering the validity of assessments used in the district and at the school so that they generate accurate information to ensure that the specialized instruction can produce progress "in light of the child's circumstances." Overall, IDEA requires that a variety of technically sound (e.g., valid) assessment tools and strategies be used (20 USCS Section 1414(b)(2)(C)). Special educators can assist the team in the initial assessment process. This will require not only being familiar with assessments available, but also potentially being a voice of accountability if working with district-mandated assessments.

Equally addressing the academic and behavioral or functional challenges for students with disabilities is necessary; yet, applying the new standard to school practice could become challenging for those in the field. Assessment information must be included for academic and functional (e.g., behavioral) needs in the PLAPFF that can help to establish initial levels to detect progress and identify the direct needs of the student (20 USCS Section 1414(b)(2)(A)). Special educators should ensure that all necessary academic and functional assessments are completed and documented in the PLAPFF. Special educators should make sure that assessments from the PLAPFF will set the stage for baseline and ongoing data that monitors a student's progress to ensure that a student's IEP is sufficiently challenging "in light of the child's circumstances" and that can be used to determine whether or not a student has received services that may be lacking and inappropriate for benefit and progress.

Special educators should also make sure that written goals are observable and measurable and that data are collected before the implementation of an IEP. With the new emphasis on measurement toward progress to ensure FAPE, for functional or behavioral goals it will be important to establish baseline behaviors and identify the function of those behaviors through initial assessment prior to student intervention. To develop an individualized goal that is specific to the student's needs, initial data are required to accurately develop appropriate benchmarks based on the student's specific circumstances. Additionally, aligning the goals with the general education curriculum, if appropriate must be considered. If goals are not appropriate, they must still be considered ambitious for the students' benefit and progress to incorporate the *Andrew F.* standard.

Ongoing Measurement

Special educators should also assist the IEP team in the ongoing measuring of progress for students in special education. Under IDEA, IEP's should include the measurement of annual goals (functional and academic) and description of the progress towards achieving the goals and when updates will be given (20 USCS Section 1414(d)(1)(A)(i)(II & III)). Further, the need for data collection is essential in order to determine (a) accuracy of the function of behavior, (b) appropriateness of the interventions selected based on the function, and (c) status of progress made through analysis. Maintaining data collection for continuous improvement allows for ongoing analysis of the IEP goals to be shared with the parents periodically and remains an integral part of the measurement of progress for a student with disabilities.

Parent Participation

Additionally, part of the problem with the *Andrew F.* case was a lack of acting on the concerns of Andrew's parents. For example, as part of the procedural safeguards, IDEA requires that IEP teams include parent information when assessing a student (20 USCS Section 1414(b)(2)(A)). Andrew's parents raised the lack of progress and inadequacies with the IEP as well as behavioral issues that were not addressed several times. After pulling him from the school and placing him into a private school where he showed progress, they re-enrolled him in public school and asked the IEP team to address his behavior to ensure he maintained the progress he had demonstrated in the private setting. Unfortunately, the IEP team did not change the IEP or adjust behavioral planning after he transitioning back to maintain success. Under IDEA, IEP development should consider the strengths of child, concerns of parents, results of evaluations, academic, developmental and functional needs and consideration of special factors, such as behavior (20 USCS Section 1414(d)(3)(A&B)). Special educators should recognize the importance of a parent's participation on the IEP team as an integral member and include their feedback into assessments, goal planning, IEP development, and delivery of services. As the child receives special education, multiple opportunities for parent engagement abound to include and encourage parental participation and communicate strengths and needs as part of the special education progress.

Alignment with General Education and Multi-Tiered System of Supports (MTSS)

MTSS includes a data-based problem-solving process to identify students that are unresponsive to the core instruction and determines the intensity/focus of instruction/interventions designed to meet students' behavioral and academic needs including their social and emotional needs for continual improvement through early identification. With the new emphasis for FAPE on considering the general education curriculum for students who can be fully integrated and the need for data to determine progress, special educators should consider whether their schools are using MTSS, such as school-wide Positive Behavior Intervention and Support (PBIS), to address the needs for *all* students within and across schools in general education. Although flexibility with IDEA funds can be used for MTSS, *Andrew F.* did not mandate the use of MTSS because MTSS is not the same as special education. While MTSS is a general education initiative, it is considered best practice for organizing resources to meet the needs of all students in a school. As well, MTSS should be considered by the special educators working in a school since FAPE requires a consideration of progress in general education for some students who can be fully integrated.

More specifically, MTSS applies a tiered system of intervention with universal supports at Tier 1 addressing all students, targeted supports at Tier 2 focusing on smaller groups (about 15%), and intensive supports at Tier 3 for individual students (about 5%) (Algozzine & Algozzine, 2007; Sugai & Horner, 2002, 2009). As data identify students not responding well to the universal interventions (e.g., display of behavioral expectations, adherence to rules in specific settings, etc.), the intensity of behavioral supports may increase in a supplemental, yet, not supplanted approach. In other words, all students (including students in special education) receive universal supports regardless of needs, but some may receive additional instructional minutes for increasing their skill repertoire to enhance success at the universal level. As student needs increase and/or decrease across this continuum of supports, the fluidity of supports provided move with the student based upon their specific need (i.e., unique circumstances). This means

that students with disabilities and with IEPs might be involved in tiered interventions, but might also require even greater specialized instruction through special education and their IEP.

With MTSS, the effectiveness of both academic and behavior supports within MTSS should be frequently and consistently monitored to determine whether (a) the intervention is working and is no longer needed, (b) the intervention is working and should be continued, or (c) the intervention is not working, and therefore a different (and possibly more intensive) intervention should be implemented. Ongoing assessments, such as initial screening and progress monitoring matched to the needs of the student drive the appropriate level of intervention for both behavior and academics.

To reiterate, *Andrew F.* does not require that schools use MTSS for students with disabilities. However, *Andrew F.* does include a consideration of progress in the general education curriculum for students who can be fully integrated. Special educators should ensure that students with disabilities are screened along with their peers in the general education curriculum to identify any gap that does not require specialized instruction of special education, assist in establishing appropriate goals through the initial baseline data and engage in ongoing progress monitoring. Through data analysis, a special educator should consider the student's level of need by examining progress for both academics and behavior across the tiers. As well, special educators might consider if the needs of their students can be met in general education using the school's established MTSS interventions. Although the IEP governs specific special education instruction and is what is most relevant to *Andrew F.*, teachers that participate in schools using MTSS should ensure they are considering progress in their supports provided to all students including students in special education whose needs are being addressed through MTSS.

Behavior Intervention Plans (BIPs)

BIPs, sometimes referred to as Behavior Support Plans (BSPs) are used for students who have behavioral challenges that require direct intervention and are often developed in conjunction with the IEP. A behavior specialist relies on a functional behavior assessment (FBA) to identify why (function) the behavior is occurring and uses this assessment to select interventions most likely to work for the student. The interventions are then written into the BIP and data are collected prior to initiating the interventions and throughout the implementation of the intervention to gauge progress.

With *Andrew F.*, Andrew was displaying behaviors that were severe enough that the private school developed a Behavior Intervention Plan. Once the BIP showed behavioral improvement, Andrew also began to make academic gains. In the public school, the behaviors noted were raised by the parents, but were not addressed in either the IEP or through a BIP even when he returned to the school after showing progress in the private setting. Without even addressing and assessing the behaviors initially, no progress could be measured in the public school.

In the final decision made by the Circuit Court after applying the new standard from the Supreme Court, the Circuit Court stated, "Moreover, despite his maladaptive and disruptive behaviors that prevented his ability to access education, the district failed to conduct a functional behavioral assessment, implement appropriate positive behavioral interventions, supports or strategies, or develop an appropriate Behavior Intervention Plan (BIP; *Andrew F.*, 2018, p. 7). His parents

argued, “. . . that Petitioner’s lack of progress, and a proposed IEP that was a continuation of that pattern, coupled with the failure to provide reporting and behavior assessment/intervention, resulted in a denial of a FAPE” (*Andrew F.*, 2018, p. 8).

In applying the new *Andrew F.* standard, the Circuit Court determined that changes made by the school on the IEP were

. . . only updates and minor or slight increases in the objectives, or carrying over the same goals from year to year, or abandonment if they could not be met. The April 2010 IEP was clearly just a continuation of the District’s educational plan that had previously only resulted in minimal academic and functional progress. (*Andrew F.*, 2018, p. 16).

The Circuit determined that this was insufficient. “The District’s inability to properly address Petitioner’s behaviors that, in turn, negatively impacted his ability to make progress on his educational and functional goals, also cuts against the reasonableness of the April 2010 IEP” (*Andrew F.*, 2018, p. 17). The Court declined to decide on whether Andrew was making progress in the private school; yet, suggested that there was a lack of progress in the public school, including not having a set FBA and BIP that inevitably resulted in a denial of FAPE. It is important for special educators to remember that they are often the direct liaison between the school team and the families. Remembering to consult and collaborate with parents and the IEP team on behavior concerns is critical. If an FBA is needed to design a BIP, data will need to be continually collected before and during the delivery of services to assess and monitor behavioral progress and student outcomes can be more impactful with parent participation.

Conclusion

In sum, it is now the responsibility of the IEP team and special educator to ensure that not only the IEP enables a student to receive educational benefit, but also that there is also an emphasis on the progress a student can make in accordance to their unique circumstances. More than ever, special educators must measure and record progress where students with disabilities are educated in general education through MTSS, the IEP, and in the BIP. If these activities do not occur, it will be far more challenging for the IEP team to claim that they are providing FAPE for the student with disabilities. Special educators are an integral part of the IEP team and assist in the completion of valid assessments, identification of student specific needs derived from data, providing the recommended interventions based on the assessments and student’s circumstances, analyzing results to determine student progress, and continuing to serve as the liaison to the parents and caregivers for continual engagement. The case of *Andrew F.* has raised the legal standard from minimal provided benefit to a consideration of progress, making the role of the special educator vital in the provision of FAPE.

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Creating Self-Efficacious Special Educators through Mentoring during Teacher Preparation

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Abstract

The purpose of this study was to examine the effects of a specific mentoring intervention on the teaching self-efficacy of pre-service special education teacher candidates. A Special Educators Efficacy Scale (SEES) was developed to measure self-efficacy for the initial skill set required for novice special educators. A two-group, pre-test/post-test design was used to compare the special education teaching self-efficacy scores between the intervention and comparison group. The self-efficacy scores reported by 245 pre-service special education candidates from two universities were analyzed (intervention group, $N = 43$; comparison group, $N = 202$) before and after a 10-week mentoring intervention. ANCOVA findings indicated a statistically significant difference across all subscales between groups while controlling for the pre-test scores. The analysis of demographic characteristics such as age and grade level did not reveal any statistically significant differences between groups.

Creating Self-Efficacious Special Educators through Mentoring during Teacher Preparation

Novice special education teachers are required to enter the field with a solid understanding of how individuals with disabilities learn (Council for Exceptional Children, 2013). They are charged with the daunting task of presenting content across all disciplines for individuals with distinct learning styles and for understanding the vast characteristics of a multitude of disabilities. The novice special educator must also possess specific knowledge in the utilization of research-based interventions and data collection to monitor student progress. The unique responsibilities of special educators, isolation from general education teachers, and limited access to appropriate mentors often present insurmountable challenges for the novice special educator (Brownell, Ross, Colon & McCallum, 2005; Duffy & Forgan, 2005; Washburn-Moses, 2010). The effects of these challenges are high rates of teacher attrition in the field of special education and ongoing research regarding teacher self-efficacy and mentoring that may improve the resiliency of novice special educators.

Researchers report novice teachers leaving the profession at epidemic rates (Billingsley, 2003; Plash & Piotrowski, 2006; Smith & Ingersoll, 2004). It is estimated that 30 percent of general education teachers leave the profession within the first three years of teaching. However, according to Smith and Ingersoll (2004), the rate of novice special educators leaving the profession is 2.5 times higher than that of novice general education teachers. A 2002 study by the Study of Personnel Needs in Special Education (SPeNSE) revealed that 6 percent of all novice special education teachers who were interviewed planned to leave their jobs immediately after the first year of teaching. This shortage of special education teachers is more severe than any other areas of teaching (Boe, Cook, & Sunderland, 2005), with the shortage of certified special education teachers ranging from 20–30% higher than the shortage of certified general education teachers. The special education teachers cited unmanageable workloads, excessive

paperwork, multiple categories of disabilities per classroom, inadequate preparation, and lack of mentoring as the primary reasons for leaving. A 16-year examination of long term trends in the attrition rates of special educators between the 1987/1988 school year through the 2002/2003 school year revealed a steady annual increase in special education teacher shortages (Boe, 2006). The attrition rates almost doubled from 7% in 1993/1994 to 13% in 2002/2003, which created a shortage of approximately 54,000 special educators nationwide.

Highly qualified special education professionals continue to be in high demand (U.S. Department of Education, 2011), but the effect of the shortage has created a practice of hiring alternatively certified or uncertified personnel to work with students with disabilities. Data from the U.S. Department of Education indicated an increase in uncertified special education teachers and showed that over 11% of all special educators were uncertified to work with students with special needs.

These alarming statistics and persistent gaps in student achievement nationwide, particularly among students with disabilities, have prompted further investigation into the preparation and retention of special educators. To meet the above mentioned challenges, several theories have been explored to improve teacher attrition and effectiveness. Teacher self-efficacy based on Bandura's (1997) cognitive theory of social learning has been researched extensively. High teacher self-efficacy has been considered a predictor of teachers who may be better able to deal with the challenges of the first years of teaching. Teacher self-efficacy is also considered to be an indicator of teacher motivation, resiliency, and effectiveness in the classroom (Lee, Patterson & Vega, 2011; Pendergast, Garvis & Keogh, 2011). High levels of teacher self-efficacy are associated with confidence in meeting student needs, improving student motivation, and higher levels of student achievement (Woolfolk, 2007). The ability of individuals to influence the world around them is strongly linked with belief in their ability to bring about change. A teacher's sense of self-efficacy has also been associated with personal goal setting and the persistence to meet these goals.

In response to the high novice teacher attrition rates, the theories and benefits of mentoring relationships have also been investigated in higher education and public education over the past two decades (Darling-Hammond, 2003; Ingersoll & Strong, 2011). The research indicated a positive relationship between mentoring and levels of teacher self-efficacy (Beckford & Roland, 2010; Pendergast et al., 2011). Mentoring relationships are defined as a collaborative model in which novice teachers are directly assisted by seasoned professionals to develop the required skills for effective teaching (Sweeney, 2008). The model should be a continuum beginning during initial certification preparation at the university level and include professional collaboration between pre-service teacher candidates, mentor classroom teachers, university mentors, and field supervisors (Beckford & Roland, 2010; Hudson & Skamp, 2003). A review of literature (Billingsley, 2003) recommended mentoring models for pre-service special education candidates that includes mentoring in role management, collaboration skills, and inclusion pedagogy.

Several recommended practices are currently being utilized and/or researched for effectiveness in mentoring pre-service teachers. Some models include professional development school-university partnerships, peer placements, dual certification, action research, and service learning.

The models may vary slightly in design; however, the underlying objectives are similarly grounded in integrated experiences, collaboration, community, linking theory to practice, and a mentoring continuum from pre-service through the first years of teaching (Hobson, Harris, Buckner-Manley & Smith, 2012). Although certain aspects of mentoring models for pre-service teachers address serving individuals with exceptionalities, there is relatively little research directed specifically at the mentoring and preparation of pre-service special education candidates. In an effort to adequately address the needs of special education pre-service teachers, the present study utilized a mentoring intervention in an attempt to develop efficacious special education teachers equipped to teach and remain in the profession.

Theoretical Framework

The study was organized and viewed through theories of experiential learning, social learning, and self-efficacy (Bandura, 1977; Dewey, 1938; Rotter 1954; Vygotsky, 1978). These learning theories emphasize the critical components of modeling and observation in learning behaviors. *Experiential learning theory* emphasizes participation in learning behaviors in which learners gain knowledge through active engagement and collaboration with skilled mentors. Pre-service special educators prepare for professional life through experiential programs such as school-university partnerships, service learning, and student cohorts.

Social learning theory describes a process of learning behaviors through social experiences as well as through reciprocal relationships of observing the characteristics, attitudes, and reactions of others. Social learning is achieved as pre-service special education candidates observe, rehearse, and adopt the modeled behaviors of experienced professionals.

Additionally, this study utilized the foundation of *self-efficacy theory* to investigate relationships among social learning, experiential learning, and changes in self-efficacy in pre-service special education teachers. The highly collaborative nature within the field of special education warrants this particular set of lenses for this study,

Research Questions and Hypotheses

The research study sought to answer the following research questions:

1. What is the effect of an intensive mentoring intervention on the teaching self-efficacy of pre-service special education teacher candidates?
2. Does age moderate an effect of treatment on teaching self-efficacy?
3. Does level within the preparation program (sophomore, junior, senior) moderate an effect of treatment on teaching self-efficacy?

These questions were guided by the following hypotheses:

- a) H_0 : There is no difference in the change in teaching self-efficacy between the control and intervention groups.

- b) H_0 : Age does not moderate an effect of treatment on teaching self-efficacy.
- c) H_0 : Level within the preparation program (sophomore, junior, senior) does not moderate an effect of treatment on teaching self-efficacy

Methodology

Research Design

The quasi-experimental quantitative study employed a teacher efficacy instrument created to measure self-efficacy related to the responsibilities specific to special educators. Quantitative research consists of numerical data and quantifying relationships between variables (Mertens, 2010). The quantitative research design enabled the researcher to express relationships between variables using effect statistics such as correlations or differences between means in an effort to test the null hypothesis and identify any statistically significant differences (Cronbach, 1982; Field, 2013). This study sought to examine relationships between the changes in pre-service special educator self-efficacy prior to and following the provision of an intensive mentoring intervention during teacher preparation.

The quantitative quasi-experimental survey research design was chosen to compare repeated measurements between groups (comparison and intervention) before and after introducing an intensive mentoring intervention (Patten, 2011; Salant & Dillman, 1994). The quantifiable data warranted the research design and correlational analysis.

Setting and Participants

The study took place in an urban setting of a Midwestern state, primarily due to researcher accessibility. The city is the third largest in the state, with an estimated population of 120,235 (United States Census Bureau, 2012). The urban setting contains two institutions of higher education within the city limits. The study included pre-service special education teacher candidates enrolled in two accredited special education teacher preparation programs. The participants were undergraduate candidates seeking initial licensure in special education from one private and one public institution. They were enrolled in at least one of the nine sections of special education coursework with an associated semester-long clinical internship or student teaching practicum. The criteria for participation also included the requirement of the completion of a minimum of one clinical internship. This criterion ensured that the participants had some experience in the classroom and could provide responses based on practical experience and exposure to realistic roles of special educators. The candidates ranged in age from 19-22 years and were from sophomore to senior standing (second through fourth year).

The study included pre-service special education teacher candidates enrolled in two accredited special education teacher preparation programs. The participants were undergraduate candidates seeking initial licensure in special education from one private and one public institution. They were enrolled in at least one of the nine sections of special education coursework with an associated semester-long clinical internship or student teaching practicum. The criteria for participation also included the requirement of the completion of a minimum of one clinical internship. This criterion ensured that the participants had some experience in the classroom and could provide responses based on practical experience and exposure to realistic roles of special

educators. The candidates ranged in age from 19-22 years and were from sophomore to senior standing.

Sampling

Convenience sampling was used and based on researcher accessibility (Mertens, 2010). The similarities in state special education teacher licensure requirements and teacher preparation programs were also considered when choosing the university sample pool. University faculty from both institutions identified participants based on the above criteria. Approximately 75 pre-service special education teacher candidates from the private institution and 190 from the public institution were invited to take part in the study. Pre-service special education teacher candidates were recruited during internship orientation seminars near the beginning of the spring semester. They were recruited by invitation to complete the special education teaching efficacy scale and participate in the mentoring intervention group. The invitations were sent via email, with follow up email and class visits to encourage survey completion. The pre-service special education teacher candidates chose to join the intervention group or participate only in the survey portion of the study (comparison group). Pre-service special education teacher candidates were ensured of respectful and ethical practices while participating in the study and those who chose to participate in the mentoring group remained confidential. The self-efficacy scale was administered as an online survey, and participants were instructed to create an identification code to ensure anonymity of responses.

Instrument Construction

The survey instrument was created using recommended guidelines and consisted of 23 numerical scale (0-10) response items. (Bandura, 1997; Tschannen-Moran & Woolfolk Hoy, 2001; Woolfolk & Hoy, 1990). Discussion and interviews with pre-service special education teacher candidates were used to identify the domains of special education pre-service teacher efficacy and the challenges that impeded the perceived levels of teacher efficacy. Candidates revealed areas of professional preparation they believed needed further development prior to the first year of teaching. Input from pre-service candidates was compared to initial teaching standards for special educators (Council for Exceptional Children, 2013) and used to create survey items for the Special Educators Efficacy Scale employed in this study. This information was also used to design the mentoring intervention.

Reliability and Validity

Reliability was addressed through the administration of a pilot survey. The pilot Special Educators Efficacy Scale (SEES) instrument was reviewed by five professionals in the field of special education, survey creation, and statistical analysis. Suggestions from these scholars included the use of identification coding, item alignment with current standards, analysis, and item phrasing. The pilot survey was also completed by special education teacher candidates. A link to an electronic version of the SEES instrument was sent to special education teacher candidates at two universities, one public and one private via email. The item scores were analyzed to assess consistency of scores across the scale items. The pilot administration can later be compared to the results from the study to assess the degree of test-retest reliability.

Validity of the scores resulting from the SEES instrument was addressed through a factor analysis. The analysis was conducted on pilot scales to determine how pre-service special

educators respond to items and identify consistent factors. A longer scale was developed for pre-service teachers, as previous research indicated less validity in the factor structure among these respondents (Woolfolk & Hoy, 1990). The instrument items were aligned with current standards (Council for Exceptional Children, 2013) for added validity. The language used to construct survey items was consistent with descriptors provided in recent CEC Initial Level Special Educator Preparation Standards.

Construct validity is an ongoing process and is grounded in theory and hypothesis testing (Bandura, 1997). A principal axis factorial analysis was chosen and conducted on the 23-item SEES instrument to assess the dimensionality of the scale. The goal of the instrument was to remain true to the intended measure in an effort to represent face validity. The pilot administration of the instrument indicated a mean completion time of 5.4 minutes. An initial data screening revealed no missing values, a statistically significant Bartlett's measure of sphericity ($< .001$), and a determinant of the matrix large enough to suggest there were no multicollinearity problems within the data set (Field, 2013). The Kaiser-Meyer-Olkin statistic ($KMO = .702$) falls above the minimum criterion of $.5$, which indicated an adequate sample size for factor analysis with over 10 cases per variable.

The item correlation matrix indicated correlation coefficients that were not excessively large, so the researcher did not choose to eliminate any items as a result of the pilot study analysis. Both orthogonal and oblique rotations were employed for a comparison of correlation coefficients between factors (Field, 2013). The rotation results indicated correlations between three extracted factors, and the constructs being measured appeared to be interrelated. The researcher examined the item clusters with variables loading highly (standardized loadings $> .4$) and identified patterns associated with scale items among three factors that accounted for approximately 70% of the variance. The scree plot revealed a break and leveling off after the third component. A comparison of eigenvalues from the exploratory factor analysis and the criterion values from the parallel analysis support the researcher's decision to retain only three factors. The researcher used language from current CEC (2013) initial standards for special educators to create the SEES items. The pattern matrix was examined to identify themes and label subscales to align with these standards.

A reliability analysis was conducted to assess the reliability of the SEES items. The reliability analysis revealed the value of *Cronbach's alpha* (Subscale 1: $\alpha = .954$; Subscale 2: $\alpha = .895$; Subscale 3: $\alpha = .923$), which indicated the reliability of the scores obtained from the SEES instrument was good (Kline, 1999). The values of *Cronbach's alpha* when specific items were deleted did not substantially increase the overall alpha value. The researcher determined that it was not necessary to remove items to improve reliability.

Data Collection

The pre-test/post-test design consisted of a comparison group and an intervention group. The comparison group of special education pre-service teacher candidates followed the program requirements for early clinical internships (12 hours per week for 10 weeks) with an assigned cooperating teacher in the field to provide supervision. In addition to the program requirements for clinical internship hours and a supervising cooperating teacher, the intervention group of pre-service special education teacher candidates participated in a 10-week mentoring program

designed for developing teaching practices and the responsibilities unique to special education teachers, as defined in Chapter 1.

The SEES instrument was administered twice, first as a pre-test and later as a post-test. The pre-test was completed by the pre-service special education teacher candidates in both groups near the beginning of one academic semester in the spring. The post-test was administered to both the comparison and treatment group after the end of the 10-week mentoring intervention. The instrument was created using LiveText forms, a web-based data collection system. The electronic SEES instrument was launched publicly, and the link was emailed to pre-service special education teacher candidates. The instrument instructed participants to create an identification code (ID Code: Mother's first name and your birth month (i.e., MaryLou11) to allow for response matching while ensuring anonymity. Follow-up email correspondence and classroom visits were used to encourage survey completion.

Intervention Detail

Pre-service special educators were invited to join a 10-week mentoring intervention group for pre-service special education candidates. The two-hour weekly group meetings consisted of activities and presentations designed to build initial special educator teaching skills as defined by the Council for Exceptional Children (2013) and aligned with the InTASC Model Core Teaching Standards for teacher preparation. Pre-service special educators committed to the 10-week intervention, and the activities were conducted during the allotted or agreed upon time to ensure the entire group was able to participate in the experiences. The pre-service teachers who were unable to commit to the entire 10-week mentoring intervention group were not considered in the intervention group data.

Pre-service special educators in the intervention group had opportunities to collaborate with and support peers, practice teach, and benefit from additional peer and mentor feedback. The participants had the opportunity to facilitate and contribute to mock I.E.P. meetings focusing on data-driven decision making and writing measurable annual goals. Positive behavior interventions and supports as well as certification in non-violent crisis intervention techniques were provided to increase preparation for working with individuals with behavioral and emotional disorders.

The components of the mentoring intervention were based on Sweeney's (2008) guidelines for high impact mentoring programs. These components consist of, but are not limited to, modeling of effective practices, and demonstration of research based strategies for special education, resources, observation, and peer feedback. The intervention group participated in and experienced additional mentoring at the university level. Collaboration with special education professionals, agencies, and related program service providers who serve individuals with disabilities provided candidates in the intervention group multiple opportunities to demonstrate their capacity to integrate theory and pedagogical knowledge in real-life settings throughout the community. Candidates participating in the intervention group had opportunities during the group meetings to interact within not-for-profit organizations such as ARC, Best Buddies, and The Prism Project, which provide services to children and adults with disabilities in a variety of programs. The participants were encouraged to work with these agencies on their own time

outside of the intervention group on their own time only after the 10-week intervention was completed to avoid variations among mentoring time within the intervention group.

Presentations and panel discussions with professionals in the field provided additional information and preparation for the first years of teaching. University supervisors were included in the planning and presentation of topics in the mentoring intervention and were able to reinforce these skills in the field. Local agencies such as ARC, Best Buddies, and The Prism Project provided opportunities for experiences with individuals with disabilities and their parents within the community. Pre-service special education teacher candidates worked with local agencies and became involved with planning and participating in Disability Awareness events as a culminating activity to the mentoring group experience.

Data Analysis

Hypothesis testing for the study included an analysis of covariance (ANCOVA) and associated effect sizes to assess the effect of the intervention. Data were screened to ensure the required assumptions had been met. ANCOVA analysis was used to compare means for statistically significant differences between groups while controlling for another variable (covariate) such as age or level with the program (Field, 2013; Kline, 1999; Martin & Bridgmon, 2012; Mertens, 2010; Nicol & Pextman, 1999). The ANCOVA analysis also treated the pre-test scores as a covariate within the data analysis. This specific data analysis procedure was chosen to support a single dependent variable.

Findings

The findings presented include a quantitative analysis of the SEES survey results. Data screening and descriptive statistics were carried out on the survey responses. An analysis of covariance (ANCOVA), analysis of variance (ANOVA), and associated effect sizes were used to examine the research questions and hypotheses for the purpose of this study.

Description of the Sample

A total of 245 pre-service special education candidates from two universities in a Midwestern state participated in the study. The participants were completing an undergraduate program for initial special education teacher certification. Participants in both groups ranged in age from 19-22 and held sophomore through senior standings.

Data Screening and Descriptive Statistics

The data were initially explored to assess assumptions for the one-way ANCOVA analysis as well as to provide descriptive statistics. The initial data screening revealed no missing values, normal distributions, and homogeneity of variance (variance ratio < 2). Additional ANCOVA assumptions were addressed and examined to test for a linear relationship between the dependent variable and covariates and homogeneity of regression slopes.

The descriptive statistics were based on a comparison group of 202 useable surveys which represents a 76% response rate (both pre-test and post-test were matched using identification codes) and an intervention group of the 43 participants completing the entire 10-week mentoring intervention.

Presentation of Data

Findings for Research Question 1

What is the effect of an intensive mentoring intervention on the teaching self-efficacy of pre-service special education teacher candidates?

H_0 : There is no difference in the change in teaching self-efficacy between the control and intervention groups.

A one-way between groups ANCOVA was conducted for each of the subscales to examine the effectiveness of a mentoring intervention on the teaching self-efficacy of pre-service special education candidates. Mean scores for each of the previously identified subscales from the factor analysis were examined. Three separate analyses were conducted, to address the effect for each of the three subscales: Learner Development and Learner Differences, Instruction and Strategies, Curriculum Content and Planning. ANCOVA at the .05 probability level ($\alpha = .05$) was used to determine if there were statistically significant differences between the control and intervention groups on the SEES post-test scores. The analysis tested the effect of the fixed categorical independent variable (group) and a covariate (SEES pre-test) on the dependent variable (SEES post-test) for each subscale.

Preliminary investigations were conducted prior to each analysis to ensure that there were no violations of the assumptions of normality, linearity, homogeneity of variances and regression slopes, and reliable measurement of the covariate. Subscale 1 violated the assumptions of linearity and homogeneity of regression slopes. Therefore, scores for subscale 1 were transformed into rank values, and the ranked scores were used to conduct the analysis (Conover & Inman, 1982).

Levene's Test of Equality of Error Variances for subscale 1 (Learner Development and Learner Differences) indicated this assumption was not violated ($p = .33$). A Test of Between-Subjects Effects for subscale 1 indicated the groups differed significantly, $F(1, 17) = 7.18, p < .01$ with the intervention group reporting a higher mean score. The null hypothesis was rejected for subscale 1. There was a statistically significant group difference in the SEES post-test scores. The effect size ($n^2 = .17$) indicated a large effect (Field, 2013). This value also represented how much of the variance was explained by the independent variable. The value indicated that approximately 17% of the variance in the SEES post-test was explained by the independent variable (group).

Levene's Test of Equality of Error Variances was also conducted for subscale 2 (Instruction and Strategies) and indicated this assumption was not violated ($p = .13$). A Test of Between-Subjects Effects for subscale 2 indicated the groups differed significantly, $F(1, 9) = 6.14, p = .04$, and the null hypothesis was rejected. There was a statistically significant group difference in the SEES post-test scores with the intervention group reporting a higher mean score. The effect size ($n^2 = .03$) indicated a small effect (Field, 2013). This value also represented how much of the variance was explained by the independent variable. The value indicated that approximately 3% of the variance in the SEES post-test was explained by the independent variable (group).

Again, Levene's Test of Equality of Error Variances was conducted for subscale 3 (Curriculum Content and Planning) and indicated this assumption was not violated ($p = .264$). A Test of Between-Subjects Effects for subscale 3 indicated the groups differed significantly, $F(1, 11) = 5.64$, $p = .04$ with the intervention group reporting a higher mean score. The null hypothesis was again rejected. There was a statistically significant group difference in the SEES post-test scores. The effect size ($\eta^2 = .34$) indicated a large effect (Field, 2013). This value also represented how much of the variance was explained by the independent variable. This value indicated that approximately 34% of the variance in the SEES post-test was explained by the independent variable (group).

Findings for Research Question 2

Does age moderate an effect of treatment on teaching self-efficacy?

H_0 : Age does not moderate an effect of treatment on teaching self-efficacy.

To identify any statistically significant moderating effect of age on the relationship between groups and teaching self-efficacy scores an ANCOVA analysis was again conducted across the three subscales. The age variable was transformed to a mean-centered value prior to the analysis.

Levene's Test of Equality of Error Variances was conducted for subscale 1 (Learner Development and Learner Differences) and indicated this assumption was not violated ($p = .06$). A Test of Between-Subjects Effects for subscale 1 indicated the effect of the treatment did not differ significantly by age, $F(6, 12) = 0.748$, $p = .40$, and the null hypothesis was not rejected. Additionally, no main effect was evident for age, $F(4, 12) = 2.59$, $p = .09$.

Levene's Test of Equality of Error Variances was again conducted for subscale 2 (Instruction and Strategies) and indicated this assumption was not violated ($p = .38$). A Test of Between-Subjects Effects for subscale 2 indicated the effect of the treatment did not differ significantly by age, $F(4, 6) = 0.03$, $p = .87$, and the null hypothesis was not rejected. Additionally, no main effect was evident for age, $F(2, 6) = 0.948$, $p = .439$.

Subscale 3 (Curriculum Content and Planning) was also analyzed, and Levene's Test of Equality of Error Variances indicated this assumption was not violated ($p = .40$). A Test of Between-Subjects Effects for subscale 3 indicated the effect of the treatment did not differ significantly by age, $F(4, 8) = 1.02$, $p = .34$, and the null hypothesis was not rejected. Additionally, no main effect was evident for age, $F(2, 8) = 2.01$, $p = .196$.

Findings for Research Question 3

Does level within the preparation program (sophomore, junior, senior) moderate an effect of treatment on teaching self-efficacy?

H_0 : Level within the preparation program (sophomore, junior, senior) does not moderate

an effect of treatment on teaching self-efficacy

To identify any statistically significant moderating effect of grade level on the relationship between groups and teaching self-efficacy scores an ANCOVA analysis was again conducted across the three subscales.

Levene's Test of Equality of Error Variances was conducted for subscale 1 (Learner Development and Learner Differences) and indicated this assumption was not violated ($p = .40$). A Test of Between-Subjects Effects for subscale 1 indicated the effect of the treatment did not differ significantly by grade level, $F(5, 13) = 0.06$, $p = .94$, and the null hypothesis was not rejected. Additionally, no main effect was evident for grade level, $F(2, 13) = 0.185$, $p = .834$.

Levene's Test of Equality of Error Variances was also conducted for subscale 2 (Instruction and Strategies) and indicated this assumption was not violated ($p = .31$). A Test of Between-Subjects Effects for subscale 1 indicated the effect of the treatment did not differ significantly by grade level, $F(3, 9) = 0.096$, $p = .763$, and again the null hypothesis was not rejected. Additionally, no main effect was evident for grade level, $F(1, 9) = 0.706$, $p = .423$.

Subscale 3 (Curriculum Content and Planning) was also analyzed, and Levene's Test of Equality of Error Variances indicated this assumption was not violated ($p = .40$). A Test of Between-Subjects Effects for subscale 3 indicated the effect of the treatment did not differ significantly by grade level, $F(4, 8) = 0.11$, $p = .75$, and the null hypothesis was not rejected. Additionally, no main effect was evident for grade level, $F(2, 8) = 0.161$, $p = .85$.

Summary

In examining the teaching self-efficacy scores of pre-service special education candidates, statistically significant effects of the intervention were evident. The candidates participating in the mentoring intervention group reported a significantly higher post-test score on all three subscales: Learner Development and Learner Differences, Instruction and Strategies, and Curriculum Content and Planning. No statistically significant moderating effect of age or grade level on the intervention effect was evident for any of the subscales.

Discussion and Recommendations

Discussion

One goal of this study was to examine existing teaching self-efficacy instruments for an appropriate measure for pre-service special education candidates. As the review of literature for this study revealed, there was no teaching self-efficacy scale to date designed to measure special education teaching self-efficacy during teacher preparation. The SEES instrument was created using research based guidelines (Bandura, 1997) and CEC (2013) standards for the initial skill set of special educators. This study made contributions to the field of special education and teaching self-efficacy research by developing and accessing a new instrument to measure special education teaching self-efficacy.

The review of literature in preparation for this study also examined the evolution of teacher self-efficacy. The definitions of teaching self-efficacy include a careful consideration of appropriate and reliable measurement tools. The SEES instrument was designed specifically to assess special education teaching self-efficacy and to expand the meaning as it continues to evolve and interpret the power of this construct.

The primary goal of the current study as posed by research question one was to examine the effects of a mentoring intervention during teacher preparation on special education teaching self-efficacy. This study affirms the importance of a mentoring continuum beginning at the pre-service level and its relationship to teaching self-efficacy. The findings indicate that a specific mentoring intervention at the pre-service level produced positive effects on teaching self-efficacy among special education teacher candidates. The specific measure and mentoring intervention designed to meet the specific needs of pre-service special education candidates contributed to higher scores in special education teaching self-efficacy. The current study found that these mentees experienced higher teaching self-efficacy when the mentoring interventions addressed specific skill sets and the design allowed for flexibility to address the needs of the mentees.

In comparing the mean scores from the SEES between groups, the participants in the mentoring intervention group indicated a significantly higher sense of special education teaching self-efficacy between the pre-test and post-test across all three subscales. The higher mean score appeared to be closely related to activities and topics covered in the mentoring intervention group. These findings suggested that the detailed, skill-specific mentoring intervention framework helped facilitate professional growth and teaching self-efficacy among pre-service special education candidates (Hudson & Scamp, 2003). The design of the mentoring intervention purposefully allowed time to address the perceived needs of the participants (Duffy & Forgan, 2005). For example, items within the subscale Learner Development and Differences were explicitly covered throughout the mentoring intervention and yielded the greatest gains in mean scores among the intervention participants. Participants in the intervention group also indicated through discussion that these specific skills (i.e., I.E.P. meetings, documentation, behavior interventions, inclusion, collaboration, benchmarks, and goals) were also a great source of anxiety for teaching readiness and the desired skill set for initial special educators (CEC, 2013).

The findings from the current study add to the literature and are consistent with multiple studies that have reported positive outcomes on teaching self-efficacy at the pre-service level through intensive mentoring (Darling-Hammond, 2005; Hobson et al., 2012; Hudson & Hudson, 2013). Previous research investigated the relationship between mentoring experiences designed for specific skill sets and teaching self-efficacy (Hudson & Skamp, 2003; Parameswaran, 1998; Reid, Vasa, Maag & Wright, 1994). These studies argue that teachers (pre-service and in-service) who are given explicit mentoring and experiences associated with specific and unique teaching responsibilities demonstrated higher levels of teaching self-efficacy than their peers who did not experience the same mentoring opportunities. Only three of these studies focused on mentoring interventions in the area of special education (Parameswaran, 1998; Reid et al., 1994).

In a design similar to the current study, Hudson and Skamp (2003) focused on a specific mentoring intervention for teachers of primary science. Their mentoring intervention group was given a four-week intensive mentoring intervention on the teaching of primary science. The five

factor self-efficacy survey was then administered, and the findings suggested evidence of improved science teaching self-efficacy of the mentees included in the study. The researchers argued that a specific and intensive mentoring intervention may be effective in improving teacher self-efficacy even when administered over a relatively short period of time. The current study supports these findings and also reports a significant effect of a short-term mentoring intervention on teaching self-efficacy.

The findings from the current study also support previous studies in the area of special education (Parameswaran, 1998; Reid et al., 1994) that examined the teaching self-efficacy among pre-service and in-service teachers working with children displaying a variety of diverse learning needs. Parameswaran designed a specialized field experience for pre-service special education candidates during an educational psychology course. Parameswaran's findings revealed a strong relationship between the specific skills practiced in the classroom and teaching self-efficacy for learners with diverse needs.

Reid and colleagues (1994) focused specifically on teaching self-efficacy for meeting the needs of students with Attention Deficit Hyperactivity Disorder (ADHD). Their findings revealed teachers with specific preparation in the area of ADHD felt a greater sense of teaching self-efficacy toward effectively reaching this population. As supported by the findings of the current study, Reid and colleagues also asserted that there is an influential relationship that appears to exist among teachers with access to an environment of mentoring, collaboration, and specific teaching skill sets. It is argued that these unique experiences enhance overall teaching self-efficacy. Across all of the above mentioned studies, teachers who did not have access to mentoring and specific learning opportunities did not report a strong sense of teaching self-efficacy for the given student populations. The current study reported similar findings among participants in the comparison group.

In the current study, the participants in the comparison group reported lower post-test scores than participants in the intervention group. These findings may be explained by the exposure during field experiences to the vast practical skills necessary to meet the diverse needs of the student (Pendergast et al., 2011). Preconceived notions and previous educational experiences may also contribute to an overestimated sense of self-efficacy and a realization of the need for further professional development and teacher preparation. A romanticized ideal of classroom teaching may exist due to positive personal educational experiences that may falsely inflate perceptions of special education teaching self-efficacy. The realization of the need for more preparation may come after practical experiences through internships in the classroom and lead to a much more accurate account of teaching self-efficacy.

Another goal of this study as posed by research questions 2 and 3 was to examine the moderating effects of demographic variables on differences in special education teaching self-efficacy between groups. The demographic characteristics of age and grade level were not found to have a statistically significant moderating effect on the difference in teaching self-efficacy scores between the comparison and intervention groups of pre-service special education candidates. A possible explanation for the lack of effect of grade level on teaching self-efficacy may be the design of special education internship experiences. Although the pre-service teacher candidates have had more practical experiences as they progressed through the programs, these internship

experiences are vastly different. Each internship may consist of different grade levels, settings, and categories of disabilities. These results are consistent with Tschannen-Moran and Woolfolk Hoy's (2001) findings that indicated demographic variables did not influence teaching self-efficacy. Consistent with the theoretical framework of the current study, these researchers also argue that knowledge and experiences have the greatest effect on perceived teacher self-efficacy.

The theoretical framework of this study is founded in theories of teaching self-efficacy, experiential learning, and social learning. The findings of this study are supported by these theories as they relate to learning through observing mentors, instruction from mentors, and practical experiences. As outlined in this study, within the framework of social and experiential learning, higher levels of special education teaching self-efficacy were associated with specific experiences and discipline specific mentors. The experiential and social learning experiences in the mentoring intervention were aligned with the standards-based instrumentation and addressed the unique skill set of special educators. The activities in the mentoring intervention were designed to address each of the four headings for initial preparation standards: Learner and Learning, Content Knowledge and Professional Foundations, Instructional Pedagogy, and Professionalism and Collaboration. There was a strong component of social learning as it relates to professional development built into the mentoring intervention. The mentoring sessions were designed to include observation as well as evoke discussion of special education teaching practices. The strategies included within the mentoring intervention were designed to promote collaboration among peers and mentors. The modeling of lessons, collaborative planning, practice teaching, and feedback circles provided ample opportunities to share and reflect on practical experiences.

As theories of experiential learning posit, learning how to teach requires first-hand experiences. Many traditional teacher preparation programs have not consistently or adequately allowed for experiential learning prior to student teaching. The special education mentoring intervention created an opportunity for pre-service teachers to be actively engaged in teaching experiences. Participants in the intervention group were able to practice skills specific to special educators and essential for entering into the profession, such as facilitating I.E.P meetings and paperwork and collaborating with other professionals and parents. The findings of this study suggest that specific learning opportunities promote confidence in one's abilities and create efficacious teachers.

Recommendations for Practice

The findings from the current study present implications for special education teacher educators, program developers, school leaders, students with disabilities, and policy makers.

The continuation of these pre-service mentoring interventions into the novice years of teaching along with continued research may reap benefits for all stakeholders.

The SEES instrument, aligned with teaching standards for the initial skill set of special educators, may prove valuable within teacher preparation programs. These recently adopted CEC (2013) standards, which include initial and advanced preparation standards, may be used to design mentoring interventions through several stages of teaching (interns, student teachers, novice teachers). Recommendations for special education teacher educators include the use of specific mentoring interventions at the pre-service level to reduce the current attrition rates and

special education teacher shortages. Mentoring interventions at the pre-service level should be non-evaluative and allow for some fluidity to address the needs and concerns of candidates as they arise. Careful consideration of mentoring intervention components such as qualified mentors and experiences designed specifically for the needs of special educators may also assist teacher educators in building teaching self-efficacy and a resilient novice special educator.

The short time frame for this study also provides implications for the possibility of positive outcomes, even when time limitations are a concern for providing mentoring interventions at the pre-service level. A well designed short-term mentoring intervention applied over several years during special education teacher preparation may produce greater effects on teaching self-efficacy.

If research confirms teaching self-efficacy can primarily be developed at the pre-service level, special education program coordinators may consider program designs that support this development in an effort to produce self-efficacious novice special educators. Program designs that include a mentoring component as early as the first professional semester may play a pivotal role in enhancing special education teaching self-efficacy.

Although the current findings suggest that a mentoring intervention benefits pre-service special education candidates, these benefits have implications for school leaders at the district and building levels as well. School districts expend a considerable amount of resources recruiting new teachers. This can be a costly endeavor when novice special educators are not remaining in the classroom. Building principals should carefully consider partnerships with teacher preparation programs to strengthen special education teaching self-efficacy. A collaborative effort between school districts and teacher educators to design a mentoring continuum as well as effective models of professional development schools specifically designed for preparing special educators may improve teacher quality and attrition rates.

Retaining special education teachers also has implications for the educational outcomes of students with disabilities, as student achievement has been linked to teacher quality. Students with special needs struggle to close gaps in academic achievement without experienced special educators. Highly qualified special educators have the potential to change the quality of life for individuals with disabilities.

Policy makers at both the federal, state, and university level should consider providing funding for an extended period of time to support a mentoring continuum beginning at the pre-service level. A partnership between policy makers and teacher education accreditation agencies with access to teacher preparation program data may prove beneficial in assessing the effectiveness of a mentoring continuum. Providing funding, mandating mentoring interventions beginning early within special education teacher preparation, and long-term data collection may provide the evidence needed to link mentoring to student achievement and bring about change.

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Challenging Behavior in Students with an Intellectual Disability: Promoting Understanding and Compassionate Educational Practice

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Abstract

Students with an Intellectual Disability (ID) have complex learning and behavioral needs that can complicate educational programming and compete with their ability to fully participate in their education. This work aims to provide a conceptual understanding of the behavioral complexities involved in instructing students with intellectual disability through a review of the traditional evidence base as well as through the integration of more contemporary models of compassionate educational service delivery. Implications for teacher development, pre-service programming, and future research directions are also provided.

Keywords: Intellectual Disability, challenging behavior, compassionate education, behavior analysis, PBIS

Challenging Behavior in Students with an Intellectual Disability: Promoting Understanding and Compassionate Educational Practice

Schools have a responsibility to thoughtfully and meaningfully plan for the integration of students with special needs in all aspects of school community and life. Students with an Intellectual Disability (ID) are no exception. National and state legislative movements continue to favor inclusive educational settings and maximize instruction time of students with special needs with their general education peers (Connecticut State Department of Education, 2004; IDEIA, 2004). This notion is emphasized in the most recent revision of the Individuals with Disabilities Education Improvement Act, P.L. 108-446 (2004) which continues to uphold that instruction takes place in the least restrictive environment (LRE) for students.

Students with an Intellectual Disability (ID) represent a special subpopulation of the school community that may experience difficulty assimilating into inclusive classrooms and other aspects of school life due to their unique learning, physical, behavioral, and socio-emotional needs. The landmark settlement of the P.J. et al. (Plaintiffs) v. the State of Connecticut, Board of Education, et al. (2002) case brought to light the need for quality and equitable programming efforts for students with an Intellectual Disability. Specifically, educational systems became mandated to demonstrate accountability in their ability to meet the diverse needs of children with an Intellectual Disability in least restrictive learning environments, especially the regular education classroom.

Educational research, however, suggests that students with an Intellectual Disability are at an increased risk for developing a diagnosable psychiatric (comorbid) condition and/or exhibiting challenging behavior (Emerson & Hatton, 2007; Emerson, 2003). Trends in children's mental health statistics show that, in general, there is an increased number of children and adolescents with mental health issues in schools. Findings of a recent report from the Centers for Disease Control and Prevention (CDC) entitled, "Mental Health Surveillance Among Children—United States 2005-2011" indicates that millions of American children live with depression, anxiety, autism spectrum disorders, disruptive disorders, or a host of other mental health issues. This brief further denotes that a total of 13-20% of children living in the United States experience a mental disorder in a given year. To this degree children with an Intellectual Disability are but a subset of this larger school population and from a mental health perspective should be viewed within that context. However, the presence of challenging behavior, in conjunction with the increased clinical vulnerability to mental health difficulties adds a unique layer to the academic and behavioral support planning process for these students. Challenging behavior can compete with the success at which these students integrate into their educational settings, learn, and be active members of the school community.

This work provides a conceptual synthesis of the literature for managing challenging behavior in students with an Intellectual Disability within a traditional behavioral psychology framework while simultaneously advocating for the consideration of a more encompassing mental health framework like compassionate schooling. This manuscript further aims to provide an understanding of the complexities involved in properly planning for and supporting these students in order to enable environments that rightfully meet their needs.

Understanding Challenging Behavior

Challenging behavior is often the overarching term used to describe behaviors of individuals with developmental disabilities that create problems and limit their abilities to lead rich lives that reflect their interests and values (Biersdorf, 2002). Challenging behavior, in the research, is often defined as a deviant level of emotional or behavioral issues. When referring to individuals with an Intellectual Disability this type of challenging behavior has been found to be three to seven times higher than displayed by their typically developing peers (Dworschak, Ratz, & Wagner, 2016). Furthermore, the definition of challenging behaviors by Einfeld and Tonge for the Developmental Behavior Checklist (DBC) continues to be widely used and accepted: where behavior and emotions are abnormal by virtue of their qualitative or quantitative deviance, and cannot be explained on the basis of developmental delay alone and cause significant distress to the child carers or the community, as well as significant added impairment, then these behaviors and emotions are regarded as disordered (Einfeld & Tonge, 1995; p. 87). Occurrences of challenging behavior, such as aggression, destruction, and self-injury, among others, are evidenced in 10-15% of individuals with an Intellectual Disability (Emerson, 2003).

Challenging behavior can vary in degree from one individual with an Intellectual Disability to the next. Challenging behavior can encompass mildly interfering tendencies that make inclusion into the community difficult to behaviors that can have legal ramifications (Biersdorf, 2002). Rowland & Treece (2000) postulated that challenging behavior among individuals with an Intellectual Disability may serve to fulfill both a function of attention-seeking and also a

communication mechanism, i.e., an outlet for expressing boredom, frustration, lack of personal control, and/or the desire to change the current situation. In the classroom, challenging behavior can translate into behaviors that can interrupt the learning process and pose management issues.

Comorbidity. Educational and psychological research has consistently suggested that students with an Intellectual Disability are at an increased risk for developing psychological difficulties and, hence, comorbidity of an Intellectual Disability with other types of psychological disorders and health conditions is not uncommon. It is estimated that children with an Intellectual Disability are three to seven times more likely to develop a mental health condition than children without an Intellectual Disability (Borwith-Duffy, 1994; Dekker, Koot, van der Ende, & Verhulst, 2002; Koller, Richardsron., Katz; & McLaren, 1982; Linna, Miolanen, & Ebeling, 1999). For example, it is reported that children with an Intellectual Disability are more likely to experience anxiety disorders (8.7% vs. 3.6%) and meet criteria for conduct disorders (25.0% vs. 4.2%) than children without an Intellectual Disability (Emerson, 2003). Again, these statistics need to be examined within the current context of the status of student mental health in schools today. A secondary analysis study examining the prevalence of psychiatric disorders of British children revealed that 36% of children with an Intellectual Disability also have a diagnosable psychiatric condition as opposed to 8% prevalence among children without an Intellectual Disability (Emerson & Hatton, 2007).

Findings of Emerson and Hatton (2007) further revealed that a significant portion of the elevated risk for clinical diagnoses for children with an Intellectual Disability may be due to their increased rate of psychosocial disadvantage (poverty, less than optimal parenting, etc.). These authors lastly recommend that approaches to reducing the personal, social, and economic costs associated with psychiatric conditions of children with an Intellectual Disability includes focusing on both limiting exposure to adverse psychosocial conditions while also building resiliency in this population. This latter point is one that has implications for educators, particularly with respect to creative inclusive school climates.

Research Based Practices Supporting Challenging Behavior

Educating students with complex learning needs is a difficult task for all educators, including those who are specially trained to work with such special populations. The integrity of instruction for students exhibiting challenging behavior, like any other student exhibiting behavioral difficulties, may take a back seat to the management of the behavior that imposes on the instructional delivery. Hence, the climate of the classroom environment along with the competence, confidence, and compassion of the classroom teacher becomes pivotal in the quest to provide students with an Intellectual Disability rightful learning opportunities.

Literature on inclusive practices suggests that teacher knowledge about the term challenging behavior is relatively limited as are management strategies for challenging behavior (Rae & Murray, 2011). Likewise, findings of Rae and Murray (2011) further reveal that educator self-efficacy and teacher confidence in working with students with an Intellectual Disability are also relatively low. These findings have significant implications for educational practice particularly because research has identified evidenced based practices that have been empirically demonstrated to help manage challenging behavior and support learning, as well as, adaptive behavioral functioning. These strategies, three of which include the use of behavior analysis,

functional assessment based behavioral interventions, and the implementation of 3-tiered preventative school-wide behavioral paradigms are discussed in further detail below.

Behavior Analysis. Promoting systematic understanding of the function of challenging behavior is indispensable to the instructional planning and behavioral management process. Systematic understanding of challenging behavior involves careful and ongoing assessment of the child within the learning ecology. Challenging behavior can serve as a communicative function for all students, but this function is even more prominent in the learner with an Intellectual Disability. Speech and language difficulties and weakened executive functions that can accompany an Intellectual Disability make the act of appropriately expressing feelings, making requests, and/or verbalizing concerns much more taxing on their cognitive and emotional resolve. Aggressive tendencies may offer a quick alternative to communication that provides both sensory and emotional release of frustration. Likewise, internally maladaptive tendencies may also seek relief through acts of self-stimulation and even self-injury.

Learning to identify and support behavioral precursors is one way teachers can assist children who exhibit challenging behavior. Precursors to problem behavior are innocuous behaviors that reliably precede the occurrence of problem behavior (Landon, Carr, & Owen-De Scryver, 2008). Research has suggested that mild problem behaviors often serve as precursors to more severe problem behavior and are maintained by the same reinforcers (Smith & Chruchill, 2002). Such behaviors are hierarchical in their sequence of manifestation (Harding, et. al, 2001) implying that milder problem behavior typically precedes more severe behavior. Research further supports that offering students with opportunities to secure alternate yet functionally equivalent responses to triggers of problem behaviors, particularly opportunities that cue appropriate communication at the precursor-level, can be effective in alleviating the manifestation of more severe behavior (Langdon et. al, 2008). Such findings speak to the importance of teacher skill in identifying precursors to problem behavior and intervening with adaptive alternatives that meet an equivalent reinforcer in order to prevent more severe outbursts from occurring.

Functional Assessment-Based Interventions. The intensive and/or disruptive nature of challenging behavior calls for intervention planning that identifies and addresses the root of the undesired behavior. Like the manifestation of other intensive behaviors, behavioral interventions addressing challenging behavior need to be implemented to the best degree possible within natural settings, using natural change agents, and linked to and logically derived from functional behavioral assessment (Dunlap & Fox, 2011). Functional assessment-based interventions are directly informed by the outcomes of functional behavioral assessments (FBA). FBA's serve to identify the function and purpose of the behavior by uncovering the reinforcer that is maintaining the behavior given the social context. As noted by Lane, Oaks, and Cox (2007), functional assessment-based interventions that are derived from systematic behavioral analysis are more likely to produce behavior change by addressing the unique needs of the student in context. This notion of understanding the learner in context is especially indispensable for students with an Intellectual Disability whose clinical picture is sensitive to the level of cognitive and adaptive functioning present, degree of language processing, as well as, possible underlying comorbidity with other mental health issues. The educational community

needs to understand the broad context of intricacies that can envelop the student with an Intellectual Disability in order to create proper context for inclusion.

Research provides guidance as to how educators can create interventions stemming from FBA data. Umbreit, Ferro, Liaupsin, and Lane (2007) identify several decision pathways that educators can employ once the function of the challenging behavior is deduced and the replacement behaviors have been selected. The pathway outcomes include: (1) teach the replacement behavior; (2) teach the replacement behavior and improve the environment; (3) improve the environment; or (4) adjust the contingency. Umbreit and colleagues (2007) developed a decision tree that helps to determine the proper decision pathway based on the student's ability to perform the replacement behavior and an assessment as to whether the antecedent conditions represent effective practice. This decision tree process is further detailed in Lane, Oaks, and Cox (2011) and serves as a tangible resource for educators looking to implement individualized interventions that are functionally based. The use of functional based behavioral assessment techniques and interventions, however, are enhanced within a school context where there is a culture of school-wide practices that identify, teach, uphold, and reinforce pro-social and adaptive behavior for all children. Thus, this discussion would be remiss without tying it within the larger thread of school-wide behavioral support practices and the school climate reform efforts.

School-wide Positive Behavioral Interventions & Supports (PBIS). Booth (2011) denotes, "The development of inclusion within the school is as much about the school as an institution, its' cultures and organizations and the relationships it encounters, as much as about what happens in lessons (p. 306)." Positive Behavior Interventions & Supports (PBIS) is a three-tiered service delivery model that aims to provide a framework for dispensing positive behavioral strategies to support all learners in a school environment. PBIS rests on the basis that students exhibit a continuum of behavioral and academic needs and that such needs should correspond with a school's continuum of supports and interventions (Sugai, Horner, et al., 2000). This continuum ranges from universal levels of behavioral support that serve as the foundation for school-wide behavioral practices to more individualized interventions and/or programs that are driven by student need.

The systematic implementation of PBIS at the universal, whole-school level (Tier 1) involves the development, teaching, and reinforcing of school-wide expectations for all students. The universal tier of support is one that establishes the climate and routine of a school in classroom and non-classroom settings (i.e. hallway, bathrooms, cafeteria, buses, etc.) and offers incentives for adaptive behavior that aligns with school-wide expectations. Further, behavioral expectations are posted throughout the school and teaching matrixes aid to support the explicit instruction of the desired behaviors in each setting for all students.

One critical consideration when planning for universal behavioral supports is that these supports be accessible to all students. Students with an Intellectual Disability may require that behavioral expectations and the content of teaching matrixes be adapted and/or modified in order to make the learning of their content accessible. The use of pictures, modified language, and consistent skill reinforcement may assist these learners in internalizing these expectations that make for a more inclusive paradigm in meeting the needs of a diverse study body. This simple practice

would not only benefit students with an Intellectual Disability, but also students who are second language learners, students with language-based learning disabilities, and visual learners. Maintaining this level of conscientiousness would support students with an Intellectual Disability, among others, to be able to more fully participate in and benefit from the behavioral and learning expectations that underpin their schools.

Taking Understanding One Step Further: Finding a Seat for Compassion in the Classroom

The construct of compassion, as it is defined in the positive psychological literature involves a two-part dynamic: (1) the emotional response elicited when one perceives suffering of another coupled with (2) an authentic desire and willingness to help that individual (Sepaala, 2013). At its core compassion involves an awareness of one's surroundings and the personal responsibility to act on behalf of another who is in need of attention or support.

The *Compassionate Schools Project*, a collaboration between the Jefferson County Public Schools (JCPS), Metro Louisville's school district, and the University of Virginia, is an example of one paradigm that captures this consciousness in schools. The *Compassionate Schools Project* is a comprehensive six-year study that is presently in its pilot year (Year 2) with the project being implemented fully in 3 schools with 3 additional schools serving as control groups. The *Compassionate Schools Project* offers an integrative curriculum that interweaves support in academic achievement, mental fitness, health, and compassionate character.

The project lessons espoused by this model integrate a host of learning and wellness skills: social and emotional learning, deep self-understanding, stress resiliency skills, mental fitness training, physical regulation and exercise, and nutrition education. The above is achieved within a contemplative and compassionate framework based on recent scientific advancements in the understanding of brain function and the body, child and family health, child development, and academic and social functioning. It's mission focuses on the premise that, "when schools help students develop self-awareness and caring for others, they are more likely to succeed" (<http://www.compassionschools.org/program>).

Additionally, educational literature recognizes the benefits of trauma informed approaches and is looking to extend the delivery of such practices in school based contexts (Chafouleas, Johnson, Overstreet, & Santos, 2016). Trauma informed practices recognize the widespread impact of trauma in addition to its features and the tools needed to promote recovery and resilience (Substance Abuse and Mental Health Services Administration (SAMSHA), 2014). Systems that adopt a trauma-informed lense aim to create learning milieus that are marked by a level of awareness and mindful deliberation in identifying and meeting the unique learning objectives of such students. In this way, the system itself becomes vigilant of the needs of others with a particular sensitivity to student mental health and wellness issues (Walkley & Cox, 2013). This commitment then creates a class-level consciousness that is developed and maintained through the active commitment of students and teachers alike.

Literature has yet to test this model extensively. Students with an Intellectual Disability are a population whose educational needs are intertwined with physical, mental, adaptive, and cognitive health needs. School-wide commitments to compassionate schooling may certainly

benefit these students, supporting their behavior both in the classroom, as well as, school-wide. It would be a laudable effort to develop a compassionate teaching paradigm, borrowing from a trauma-informed paradigm as a basis for serving all students, those with and without identified disabilities. And through this channel promote inclusive efforts that are based in both equity and compassion. Such a model can be relatively easily folded into comprehensive 3-tiered preventative service delivery paradigms like PBIS (Chafouleas et al., 2016) and would supplement any positive school climate reform initiative.

Implications for Practice and Future Directions

The present educational era is one that is marked by the need for differentiated instructional strategies, layered curriculums, three-tiered service delivery models for student learning and behavioral supports. Educator training programs further emphasize instructional diversity as a prerequisite for teacher training. The rationale for such efforts rests on the notion that general education teachers are becoming more and more responsible for the instruction of students with exceptionalities in their classrooms (Jorgenson, Schuh, & Nisbet, 2006).

Forlin (2001) suggested that inclusion of students with a moderate to severe Intellectual Disability in regular classrooms was not perceived as overly stressful for teachers; but, more importantly, that perceived stressors corresponded to a teacher's professional competence and the behavior of the child with the Intellectual Disability. It is this behavioral piece that warrants tremendous attention when attempting to make inclusive efforts successful and manageable for all stakeholders. Hence, with proper training and support, teachers can learn to understand the function of challenging behavior at the individual student level and develop repertoires of tailored behavioral supports. Ideally, this would lend itself readily in a school that is working diligently to adopt a PBIS framework--where the promotion of a positive school climate is held a priority and school-wide expectations for behavior and learning are clear, visible, taught, modeled, and reinforced and where adaptive behavior is supported for all students including those who need modifications in its delivery.

Forlin (2001) further draws awareness to teacher self-efficacy and the need for schools to provide ample professional development for teachers in techniques that support diversity in instructional delivery and behavior management for this special student population. Differentiated instruction for the student with an Intellectual Disability thus involves the skillful delivery of adapted curriculums as well as access to durable behavioral repertoires to support challenging behavior.

Positive Behavioral Support Planning. Educational planning for students with an Intellectual Disability needs to be embedded with opportunities for the ongoing and intensive review of behavioral supports that enable learning for all students. These efforts need to be systematically evaluated for accessibility from their onset and modifications need to be created so that all learners can benefit from the structures in place. In this vein, 3-tiered models of prevention like PBIS need to keep student accessibility in mind when establishing expectations for behavior and learning at the school-wide level. This means that language, instruction, and reinforcement of these behavioral foundations be presented in a manner that reaches and supports all students.

It also becomes imperative that general and special educators and pupil personnel support faculty consult time with school leadership and their school PBIS teams (if applicable) in order to advocate for and support inclusive and tailored professional development opportunities that target such areas. Creating more inclusive school climates should always begin with keeping the needs of all students in mind and in order to do so with integrity, educators need to feel equipped and competent in their ability to provide students with the academic, behavioral, and/or socio-emotional harnessing that will allow them to participate in and prosper from school life.

Professional development. Further, educational leaders need to be attentive to the needs of the adults servicing this unique population and provide them with meaningful training, supervision, and collaborative planning time so that they may feel competent in instructing and supporting multiple facets of learning. Teacher development efforts should focus on increasing the understanding of problem behavior through skills training in conducting and/or assisting in functional behavioral analyses for these students. These efforts should not preclude direct skill instruction in identifying precursors to challenging behaviors and designing positive behavioral support systems accordingly. In this way, systematic behavioral techniques should not be reserved for specialists and can be explicitly taught to all educators to assist in the prevention and management of problem behavior in the classroom. With practice and training, teachers can learn to examine and identify the precursors of challenging behavior and dispense behavioral interventions when problem behavior is still mild (Langdin et al., 2008) so that the learning environment can be adequately manipulated to facilitate positive behavior and learning.

Professional development agendas also need to include thoughtful plans that foster teacher self-efficacy in instructing and managing students with intricate behavioral and learning needs given the compelling findings of Rae and Murray (2011). Such agendas are pivotal to the success of facilitating safe and inclusive learning environments for all students. Teacher development trajectories should thus include thoughtful training sequences for supporting students with an Intellectual Disability in the general classroom and non-classroom settings. Such professional development needs to be made available to all who share in the responsibility of supporting the intricate needs of these learners in and outside the classroom.

Pre-Service Programs & Teacher Training. The Individuals with Disabilities Education Act (IDEA, 2004) and the Every Student Succeeds Act (ESSA, 2015) have provided students with an Intellectual Disability access to the general education curriculum and classroom. While the law provides excellent educational opportunities for students with an Intellectual Disability, it places significantly more responsibility upon the general education classroom teacher to attempt to meet those needs (Harvey, Yssel, Bauserman, & Merbler, 2010). Classroom and behavior management skills are required for general teachers to be effective in inclusive classrooms. However, teachers in general education classroom settings have been provided with only limited training and exposure to students with disabilities, as well as, evidence based classroom and behavior management techniques. Teachers are often left feeling ill-equipped and lacking support to handle challenging behaviors in their classroom settings (Butler & Monda-Amaya, 2016). As a result, teachers often resort to punitive and/or exclusionary practices to address the challenging issues that arise with students with disabilities. Therefore, it is necessary for pre-service teacher training programs to include theory and practice focusing on classroom and behavior management in response to IDEA and ESSA (Harvey, et al., 2016).

Effective evidence based classroom and behavior management practices such as, PBIS, are critical factors to be included in teacher preparation programs. These skills are important for new teachers to successfully implement an inclusive classroom model (Freeman, Simonsen, Briere, & Macsuga-Gage, 2014). When PBIS is infused into pre-service teacher courses, beginning teachers are more prepared to collaboratively design interventions to prevent problem behaviors and concurrently teach appropriate behaviors resulting in a positive change for an individual child, in addition to a positive learning environment for the entire classroom (Safran & Oswald, 2003). Since the expectation implicit in IDEA (2004), is that teachers and other professionals in the field should be competent to conduct functional assessments and develop hypotheses and interventions from the results of these assessments, then providing training for this technology must become standardized in pre-service programs (Butler & Monda-Amaya, 2016, Hill & Flores, 2014). When pre-service teacher training does not provide the practical knowledge to recognize and implement effective positive behavioral intervention plans, the practice of inclusive education will continue to struggle to become effective. Until teachers are trained in effective employment of PBIS across the tiers of service delivery, students with an Intellectual Disability will reap the negative consequences of punishment and humiliation while other students in general education settings experience loss of classroom instructional time; all resultant of inadequate pre-service teacher training.

Additionally, critical components to be included in pre-service teacher training programs are evidence based classroom and behavior management skills paired with effective inclusion practices for students with an Intellectual Disability. Current data indicate that pre-service, as well as, beginning teachers feel unprepared to successfully manage the challenging behaviors that can occur in inclusive classroom settings. Teachers who are trained in the use of PBIS and other research based behavior management practices demonstrated fewer behavioral disruptions in their inclusive classrooms. Therefore, it is imperative for teacher training programs to adequately prepare pre-service educators to implement proactive techniques to manage challenging behaviors (Butler & Monda-Amaya, 2016).

All of the above efforts should optimally exist within a larger school-wide commitment to foster academic and socio-emotional resiliency of all learners. Dispensing behavioral supports within a climate of compassion would benefit a wide array of students from students with disabilities, to those with mental health struggles, to second language learners, to anyone coping with a situational occurrence that limits their ability to participate in their education. And for students whose learning and behavioral needs intersect more than one profile, such an approach could prove to be very fruitful as a supplement to or embedded within an expanded comprehensive 3-tiered service delivery model like SW-PBIS. Future research may wish to investigate such variables explicitly.

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Exploring Preservice Teachers' Perceptions of Preparedness to Teach Students with Disabilities

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Abstract

The purpose of this study was to investigate the influence of initial special education experiences on elementary preservice teachers' knowledge and comfort level regarding students with disabilities. A total of 109 preservice teachers enrolled in a dual teacher certification program (general and special education) were surveyed before and after their semester long training in special education to investigate their perceptions of preparedness to teach students with disabilities. There was a significant increase in the preservice teachers' knowledge across all disability categories. A significant increase in their comfort level occurred across all disability categories with the exception of behavior disorders. As follow up, approximately one-third of the participants completed a questionnaire which provided additional qualitative data. The results support that field experiences with students who have disabilities seems to be an influential factor in preparing teachers to become more knowledgeable and comfortable meeting the needs of these students. The implications of this study for practice and future research are discussed.

Keywords: preservice training, special education, inclusive education, mixed-methods

Exploring Preservice Teachers' Perceptions of Preparedness to Teach Students with Disabilities

The inclusion of children with disabilities in general education classrooms continues to be a widespread practice (Blanton, Pugach, & Florian, 2011; Marin, 2014). In the United States, 62% of students with disabilities spent 80% or more of their school day in general education classrooms (U.S. Department of Education, 2016). These students may have a wide variety and severity of conditions such as learning, intellectual, and physical disabilities, autism spectrum disorders, attention deficit with or without hyperactivity, or emotional disabilities. Despite the emphasis on inclusive education, researchers consistently report general education teachers feel unprepared to address the needs of students with disabilities in their classrooms (Cassady, 2011; Florian & Rouse, 2009). As students with disabilities continue to be placed in general education classes, teacher preparation programs must ensure that preservice teachers have the knowledge, skills, and attitudes to implement inclusive practices so that all students can achieve success (Cardona, 2009; Cooper, Kurtts, Baber, & Vallecorsa, 2008; Woodcock, Hemmings, & Kay, 2012). The purpose of this study was to investigate the impact of initial special education experiences on elementary preservice teachers' knowledge of and comfort level regarding students with disabilities.

Theoretical Framework

Inclusive Education

Inclusive practices became legally mandated in the United States in 1975 as a result of the Education for All Handicapped Children Act (EAHCA). This federal legislation requires children with disabilities to receive a free and appropriate public education in the least restrictive environment. A student is only removed from the general education setting when his/her access to the general education curriculum cannot be achieved satisfactorily with the use of supplemental aids and services. Since the landmark enactment of EAHCA over 40 years ago, inclusive educational practices have gradually progressed from students with disabilities having access to their neighborhood schools, to being mainstreamed in general education classrooms for part of their school day, to being fully included and educated in the general education classroom all day.

As inclusive practices evolved, legislation has also been updated and amended over the years. In 1990, EAHCA was renamed to the Individuals with Disabilities Education Act (IDEA) and reauthorized in 1992 and 1997. The latest revision, now referred to as the Individuals with Disabilities Education Improvement Act (IDEIA, 2004), continues to mandate participation in general education classrooms for students with disabilities (Burke & Sutherland, 2004). In addition, the No Child Left Behind Act (NCLB) of 2001 also supported students with disabilities by increasing school accountability for their academic achievement. The act, replaced by the Every Student Succeeds Act (ESSA) in 2015, continues to uphold protections for students with disabilities to have equal access to education.

Teacher Preparation

Teacher preparation programs play a vital role in ensuring teachers are prepared to teach students having a variety of diverse needs (Blanton et al., 2011; Vaz et al., 2015). Several researchers have indicated that the implementation of a successful inclusion program is influenced by a teacher's attitude (Burke & Sutherland, 2004; Parasuram, 2006; Savolainen, Englebrect, Nel, & Malinen, 2012). For example, Montgomery and Mirenda (2014) found that teachers with positive attitudes about students with disabilities felt more confident in their abilities to implement inclusive practices. The need to develop positive sentiments, or increased comfort levels, toward children with disabilities has appeared repeatedly in the literature (Forlin, Earle, Loreman, & Sharma, 2011; Loreman, Earle, Sharma, & Forlin, 2007). It is important to identify the conditions that promote positive attitudes towards inclusion.

Researchers have also identified that teacher attitudes towards inclusion seem to be influenced by their knowledge of students with disabilities. For example, Bender, Vail, and Scott (1995) found a positive correlation between teachers' attitudes and the number of courses taken related to teaching students with disabilities. Similarly, Burke and Sutherland (2004) found a statistically significant relationship between knowledge of students with disabilities and attitudes towards inclusion for pre- and in-service teachers. Likewise, Oswald and Swart (2011), along with Forlin and Chambers (2011), found that preservice teachers from teacher preparation programs emphasizing the education of students with disabilities were more willing to include students with disabilities in their classrooms.

Other researchers have linked field experiences to improved perceptions of teaching students with disabilities. For example, Leyser, Zeiger, and Romi, (2011) and Lancaster and Bain (2010) reported that preservice teachers who completed field experience working with students with disabilities demonstrated increased self-efficacy following the experience. In line with these findings, Bain and Hasio (2011) found that authentic experiences in classrooms with special needs students helped preservice teachers examine their own belief system about students with disabilities. They also reported learning how to work with diverse groups of students, increased flexibility, greater patience, and the ability to differentiate their instruction for students learning at different levels and rates as benefits accrued from field experiences in special education settings. Consequently, it is imperative for teacher preparation programs to provide preservice teachers the knowledge and experiences to develop positive attitudes towards inclusion.

As the inclusion of students with disabilities into general education classrooms continues to become common practice, it is vital that teachers are prepared to meet the needs of all children in inclusive classrooms (Marin, 2014). Teacher preparation programs that require special education coursework and field experiences with students with disabilities seem the most beneficial to increase preservice teachers' understanding of disabilities and, as a result, their confidence in teaching students with disabilities (Kuster, Bain, Milbrandt, & Newton, 2010; Sharma, Shakuta, & Forlonger, 2015; Taylor & Ringlaben, 2012).

Significance and Purpose

Among the myriad of research surrounding the impact of knowledge and experience on attitudes towards teaching students with disabilities, there is consensus regarding the importance of assessing preservice teachers' perceptions for the purpose of effecting change. Graduating teachers who have poor attitudes toward inclusion is simply unacceptable (Sharma et al., 2015). In contrast, preservice teachers who enter the profession with confidence and positive attitudes toward teaching children with disabilities are more likely to use successful inclusive practices at the beginning of and throughout their careers (Haugh, 2003 as cited in Woodcock et al., 2012; Lohrmann & Bambara, 2006).

Regardless of their certification area, it is essential to prepare teachers to be knowledgeable, positive and confident to facilitate success for all their students in an inclusive setting (Beacham & Rouse, 2012). The purpose of this study was to investigate the influence of initial special education experiences on elementary preservice teachers' knowledge of and comfort level teaching students with disabilities. The following research questions were examined:

1. How knowledgeable do preservice teachers perceive themselves to be regarding various disability categories at the beginning and end of initial training in special education?
2. What level of comfort do preservice teachers' have for working with students of various disability categories at the beginning and end of initial training in special education?
3. Do preservice teachers identify their coursework or field experience as being more beneficial to increase their knowledge and comfort level teaching students with disabilities?

4. How do preservice teachers distinguish between knowledge and comfort?

Methods

A mixed-methods design was used to determine preservice teachers’ perceptions of their preparedness to teach students with disabilities. In an attempt to neutralize biases inherent in any single method, researchers used sequential procedures, collecting qualitative data to elaborate on or expand the quantitative findings (Creswell, 2003). Quantitative data were obtained from a pre- and post-survey collected over two consecutive semesters (See Appendix A). Qualitative data were collected using a follow-up questionnaire completed by thirty four of the participants (31%) during the semester after they completed the survey (See Appendix B). Participation in this questionnaire was voluntary, and there were no identified risks, benefits, or incentives provided for participation.

Participants

The participants were 109 preservice teachers who attended a large public university situated in an urban city in the southeastern United States. The university is classified by the Southern Association of Colleges and Schools as a Level VI institution and by the Carnegie Foundation for the Advancement of Teaching as Doctoral/Research Intensive University. The College of Education, where the participants were enrolled, consists of approximately 1800 students in a variety of undergraduate and graduate programs ranging from bachelors to doctoral level degrees. Participants in the present study were all enrolled in the undergraduate K-6 Teacher Education program, which is the largest program in the college. The 120-credit hour K-6 program is a dual certification program that leads to a Bachelor of Science degree in Education and eligibility for teaching certificates in both Elementary Education and Collaborative Teaching (K-6). The program combines coursework with a variety of field experiences in regular education, inclusive, and special education settings. The program’s requirements and progression are shown in Table 1.

Table 1
K-6 Course Progression by Tiers

	Courses	Field Experience
Tier 1 (15 hours) Pre-Candidacy	Micro computing Systems in Education Human Growth and Development Foundations of Reading Instruction Health and Movement Education Arts in the Elementary Classroom	20 hours
Tier 2 (15 hours) Introductory Methods	K-6 Education Teaching Reading Teaching Social Studies Intellectual and Physical Disabilities Learning and Behavioural Disorders Classroom Management 1(1 credit)	250 hours

Field Experience (2 credits)

Tier 3 (15 hours) Advanced Methods	Teaching Mathematics Teaching Science Partnerships in Special Education Behavioural Management Classroom Management 2 (1 credit) Field Experience (2 credits)	300 hours
Tier 4 (12 hours) Internship	Student Teaching EEC (6 credits) Student Teaching Collaborative K-6 (6 credits)	525 hours

Note. Courses are 3 credit hours unless otherwise indicated.

As part of the program's requirements to enter candidacy in Tier 2, all of the participants had passed initial state testing requirements, obtained a grade point average of at least 2.75 on a 4.0 scale, and had passed a state required background check. The participants were selected as a convenience sample of K-6 Teacher Education majors enrolled in one of their required special education courses (Learning and Behavioral Disorders) during the second semester of their third year. The participants included 108 females and one male. Ninety (83%) were White; seventeen (16%) were Black; one was Hispanic, and one was Asian. Most participants (94%) were between the ages of 20-25, and the remaining six participants (5%) were over 30 years old.

Program

When the pre-post survey was completed (Tier 2), the participants, routinely labeled as juniors in terms of hours completed in higher education, began their introductory methods coursework and field experience in both general and special education. The initial special education coursework during this semester consisted of two-3 credit hour classes (Learning and Behavioral Disorders and Intellectual and Physical Disabilities) which met face to face for 75 minutes of formal instruction twice per week for 16 weeks (each course). The course content included information (definitions, characteristics, prevalence, causes, and identification) regarding children with the following disabilities: intellectual disability, learning disability, emotional or behavioral disorders, autism spectrum disorders, communication disorders, deafness and hearing loss, blindness and low vision, physical disabilities, health disabilities, and multiple disabilities. Additional topics included the foundations and history of special education, legal requirements, eligibility process, Individualized Education Programs (IEP), planning of services, and evidence-based practices to meet the needs of students with disabilities in school settings. The course requirements consisted of weekly quizzes, a final exam, and application projects such as the development of an IEP given a case scenario and the implementation of an accommodation plan for a student with a disability in the field.

Concurrently, the participants were enrolled in field experiences which required them to complete a total of 250 hours in general education, inclusive, and special education elementary classroom settings with at least 75 hours spent exclusively in self-contained classrooms with students with low-incidence disabilities. Preservice teachers were assigned to one of 33 schools in four public school districts located in two southern states in close geographic proximity to the university where the participants were enrolled. The schools were jointly selected by the College of Education and school district administrators to host preservice teachers in the K-6 Education program based on the leadership in the school, the capacity of the school faculty to mentor new teachers, and the presence of special education students. Participants were assigned a general education teacher, special education teacher, and university supervisor who served as mentors and evaluators as they conferenced regularly with preservice teachers while observing and evaluating them informally and formally.

Data Collection and Analysis

Data were collected from preservice teachers during two consecutive semesters to determine the impact of their initial training in special education on their knowledge of various disability categories and comfort with students of various disabilities. Participants from group 1 ($n=46$) completed the pre- and post-survey during their spring term, and participants from group 2 completed their pre- and post-survey during the following fall term ($n=63$). During the first and last class meeting of their Learning and Behavioral Disorders course, students were asked to complete a paper and pencil survey that was developed by the first author (see Appendix A).

On the survey, participants ($n=109$) rated their knowledge of and comfort level regarding nine categories of special needs—intellectual disabilities, physical/health disabilities, low incidence/multiple disabilities, learning disabilities, behavior disorders, autism spectrum disorders, communication disorders, deaf and hearing loss, and blind and vision loss—using a 5-point scale ranging from 1-no knowledge or not comfortable to 5-very knowledgeable or very comfortable. The Statistical Package for Social Sciences (SPSS) was used to analyze quantitative data.

This study employed two different sets of analyses to answer the quantitative research questions guiding the study. Paired-samples *t*-tests were conducted to determine whether significant changes occurred in preservice teachers' knowledge and comfort levels from the beginning of their initial coursework and field experiences in special education to the end. One-way, within-subjects, analysis of variance (ANOVA) was employed to determine whether significant differences existed in preservice teachers' knowledge and comfort based on disability category.

Because preservice teachers' perceptions were examined at two different times and across nine disability categories, multiple hypothesis tests were conducted. A total of 20 separate paired-samples *t*-tests were required to test for differences across all disability categories on both knowledge and comfort. When multiple tests are conducted, the risk of Type I error (claiming a significant effect when none exists) increases (Armstrong, 2014).

A well-established, albeit conservative, method for addressing the problem of increased risk of Type I error caused by multiple hypothesis tests is the Bonferroni correction (Armstrong, 2014; Perneger, 1998). Adjusting the alpha significance level using the Bonferroni correction involves

dividing the alpha critical (in most cases $\alpha = .05$) by the number of hypothesis tests conducted. While adjusting the alpha significance level using the Bonferroni correction does reduce the risk of committing a Type I error on any individual hypothesis test, the method is also criticized for the problems it creates, including increasing the risk of Type II error - failing to identify an effect when one does exist (Armstrong, 2014; Perneger, 1998). Perneger's (1998) offers the following advice "simply describing what was done and why, and discussing the possible interpretations of each result, should enable the reader to reach a reasonable conclusion" (p. 1237). In the current study, sets of 20 hypothesis tests were conducted to examine mean differences as well as correlation relationships. Using the conservative Bonferroni correction, an adjusted alpha level of $\alpha = .0025$ could be applied to individual tests of significance. In the current study, results of individual tests are reported with specific values of alpha included so that readers may consider the results based on their own desired level of scrutiny (Armstrong, 2014; Perneger, 1998).

Written responses to a follow up questionnaire served as qualitative data in this study (See Appendix B). The researcher-created questionnaire contained three open-ended questions and two closed items to collect additional retrospective perspectives from the participants about their initial special education experiences. Thirty four participants (74%) from group 1 completed the questionnaire. To address reliability and validity, a pragmatic bracketing technique (Gearing, 2004) was used to remove much of the researchers' preconceptions by keeping an open context and setting aside presumptions surrounding preservice teachers' initial exposure to children with disabilities in elementary classrooms.

Qualitative data analyses entailed the identification and categorization of themes in participants' responses. During the initial phase of data analysis, two researchers individually searched responses for significant statements--a few words, phrases or sentences having particular relevance to the research questions. Responses were then reviewed again to confirm accuracy of and examine connections between significant statements on a combined list. Like statements were grouped together and, then, collaboratively examined for themes. Finally, each theme was reviewed to identify the presence of any sub-themes.

Results

Knowledge. The first research question examined preservice teachers' perceived knowledge of various disability categories at the beginning and end of initial coursework and field experiences in special education. Preservice teachers' knowledge of various disability categories was measured using a five-point Likert-type scale (no knowledge = 1; somewhat knowledgeable = 2; no opinion = 3; knowledgeable = 4; very knowledgeable = 5). Mean scores and standard deviations were calculated for each disability category at both time points, and results are displayed in Table 2. A mean score and standard deviation were also calculated at both time points for a composite score representing overall knowledge of all disability categories (see Table 2).

Paired-samples *t*-tests were conducted to determine whether a significant change occurred in preservice teachers' perceived knowledge of disabilities categories from the beginning of coursework and field experiences to the end (see Table 2). Results indicated a significant increase in preservice teachers' knowledge across all disability categories (note: all mean

comparisons satisfied the conservative Bonferroni corrected alpha criterion by achieving significance levels of $p < .0025$). Similarly, a significant increase in the preservice teachers' overall knowledge of disabilities, represented by the average-based composite scores, was observed (see Table 2).

Table 2
Knowledge: Descriptive statistics and mean comparisons

	Pre-survey (beginning of semester)		Post-survey (end of semester)		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Intellectual Disabilities	2.21	0.98	3.94	0.64	17.258***
Physical/Health Disabilities	2.45	1.06	3.74	0.84	10.125***
Low Incidence/Multiple Disabilities	1.90	0.98	3.68	0.83	15.019***
Learning Disabilities	2.64	1.07	4.12	0.67	13.376***
Behavior Disorders	2.48	1.14	4.00	0.78	13.582***
Autism Spectrum Disorders	2.33	1.15	4.06	0.71	15.238***
Communication Disorders	2.15	1.08	3.75	0.82	13.135***
Deaf and Hearing Loss	2.18	1.08	3.73	0.90	12.975***
Blind and Low Vision	1.97	1.00	3.65	0.90	15.077***
Overall Knowledge (average score across all disability categories)	2.25	0.80	3.85	0.60	19.186***

Note. * $p < .05$. ** $p < .01$. *** $p < .0025$.

One-way, within-subjects, analysis of variance (ANOVA) was employed to compare preservice teachers' perceived knowledge across the various disability categories. The ANOVA was conducted using the pre-survey data to determine whether preservice teachers perceived a greater knowledge of certain disability categories compared to others at the beginning of their special education coursework and field experience. Prior to ANOVA testing, the pre-survey data was checked for violations of sphericity using the Mauchly test. Data satisfied the assumption of sphericity when the variances of the differences between all combinations of groups to be compared in the within-groups ANOVA are equal (Warner, 2013). The assumption of sphericity is comparable to the assumption of homogeneity of variance used for between-subjects ANOVA which requires that the variances of the groups being compared must be equal (Warner, 2013). The pre-survey data failed to satisfy the assumption of sphericity (Mauchly's $W = .189$; $\chi^2(35) = 161.945$; $p < .001$); therefore, the conservative Greenhouse-Geisser correction to degrees of freedom was employed (Warner, 2013).

The within-subjects ANOVA using the pre-survey data and Greenhouse-Geisser correction to degrees of freedom was significant [$F(5.519, 551.862) = 11.036$; $p < .001$], indicating that differences did exist in the preservice teachers' perceived knowledge of some disability categories compared to others at the beginning of special education coursework and field experience. The preservice teachers reported being most knowledgeable of Learning Disabilities

($M = 2.64$; $SD = 1.07$), Behavior Disorders ($M = 2.48$; $SD = 1.14$), and Physical/Health Disabilities ($M = 2.45$; $SD = 1.06$) categories and least knowledgeable of the Low Incidence/Multiple Disabilities ($M = 1.90$; $SD = 0.98$) and Blind/Low Vision ($M = 1.97$; $SD = 1.00$) categories. Post-hoc t -test comparisons indicated that the preservice teachers' perceived knowledge of Learning Disabilities, Behavior Disorders and Physical/Health Disabilities was significantly greater than their perceived knowledge of Low Incidence/Multiple Disabilities and Blindness/Low Vision.

The second one-way, within-subjects, ANOVA was conducted using the post-survey data to determine whether preservice teachers perceived a greater knowledge of certain disability categories compared to others at the end of their coursework and field experience. Again, the data failed to satisfy the assumption of sphericity (Machly's $W = .145$; $\chi^2(35) = 191.589$; $p < .001$). The Greenhouse-Geisser correction to degrees of freedom was employed for ANOVA significance testing of the post-survey data.

The within-subjects ANOVA using the post-survey data was significant [$F(5.304, 541.034) = 9.652$; $p < .001$], indicating that differences existed in the preservice teachers' perceived knowledge of some disability categories compared to others at the end of special education coursework and field experience. After participating in coursework and field experience, the preservice teachers reported being most knowledgeable of the Learning Disabilities ($M = 4.12$; $SD = 0.67$) and Autism Spectrum Disorders ($M = 4.06$; $SD = 0.71$) categories. The preservice teachers reported less knowledge on several of the other disability categories. Post-hoc t -test comparisons confirmed that the preservice teachers were significantly more knowledgeable regarding Learning Disabilities and Autism Spectrum Disorders than any of the following disability categories: Blind and Low Vision; Communication Disorders; Deaf and Hearing Loss; Low Incidence/Multiple Disabilities; Physical/Health Disabilities.

Comfort. The second research question examined preservice teachers' reported level of comfort working with students of various disability categories at the beginning and end of initial coursework and field experiences in special education. Preservice teachers' level of comfort working with students of various disability categories was measured using a five-point Likert-type scale (not comfortable = 1; somewhat comfortable = 2; no opinion/neutral = 3; comfortable = 4; very comfortable = 5). Mean scores and standard deviations for each disability category at both time points are displayed in Table 3. The mean scores and standard deviations for the composite scores representing overall comfort working with students with disabilities (both pre-survey and post-survey scores) are also included in Table 3.

Paired-samples t -tests were conducted to determine whether preservice teachers' reported level of comfort working with students of various disability categories changed significantly from the beginning of their special education coursework and field experience to the end (results displayed in Table 3). Results indicated a significant increase in the preservice teachers' comfort across all disability categories except Behavior Disorders. The preservice teachers did not report a significant increase in their level of comfort working with students with Behavior Disorders. However, due to the significant increases in comfort with the other disability categories, the preservice teachers' overall comfort working with students with disabilities did increase significantly (see Table 3). An additional paired-samples t -test was conducted to compare the

preservice teachers increase in comfort (overall comfort) over the semester to their increase in knowledge (overall knowledge) during that same time. The paired-samples *t*-test was significant ($t = 10.029$; $p < .001$), indicating that the preservice teachers perceived a greater increase in their knowledge of disability categories than in their comfort working with students with disabilities.

Table 3
Comfort: Descriptive statistics and mean comparisons

	Pre-survey (beginning of semester)		Post-survey (end of semester)		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Intellectual Disabilities	3.36	1.05	4.01	1.01	5.324***
Physical/Health Disabilities	3.28	1.16	3.75	1.14	3.741***
Low Incidence/Multiple Disabilities	3.14	1.10	3.60	1.21	3.417***
Learning Disabilities	3.69	0.96	4.24	0.81	5.315***
Behavior Disorders	3.54	1.04	3.76	1.21	1.62
Autism Spectrum Disorders	3.43	1.17	4.18	0.95	5.71***
Communication Disorders	3.43	1.00	3.97	0.95	4.647***
Deaf and Hearing Loss	3.07	1.14	3.48	1.20	3.269***
Blind and Low Vision	3.08	1.09	3.53	1.18	3.825***
Overall Knowledge (average score across all disability categories)	3.34	0.86	3.84	0.84	5.542***

Note. * $p < .05$. ** $p < .01$. *** $p < .0025$.

Two one-way, within-subjects, ANOVAs were conducted to compare the preservice teachers' reported comfort across the various disability categories. One within-subjects ANOVA was conducted using the pre survey data to determine whether preservice teachers reported a greater level of comfort with certain disability categories compared to others at the beginning of their special education coursework and field experience. Prior to ANOVA testing, it was found that the pre-survey comfort data violated the assumption of sphericity (Machly's $W = .096$; $\chi^2(35) = 232.637$; $p < .001$). Therefore, the degrees of freedom used for ANOVA significance testing were adjusted using the Greenhouse-Geisser correction.

The within-subjects ANOVA using the pre-survey comfort data and Greenhouse-Geisser correction to degrees of freedom was significant [$F(4.823, 491.907) = 9.793$; $p < .001$], indicating that differences did exist in the preservice teachers' reported level of comfort across disability categories at the beginning of their special education coursework and field experience. The preservice teachers reported being most comfortable with students with Learning Disabilities ($M = 3.69$; $SD = 0.96$) and Behavior Disorders ($M = 3.54$; $SD = 1.04$). Conversely, the preservice teachers reported being least comfortable with students in the Deaf/Hearing Loss ($M = 3.07$; $SD = 1.14$) and Blind/Low Vision ($M = 3.08$; $SD = 1.09$) categories. Post-hoc *t*-test comparisons indicated that the preservice teachers were significantly more comfortable with students with

Learning Disabilities and Behavioral Disorders than they were students in the Deaf/Hearing Loss and Blind/Low Vision categories.

A final one-way, within-subjects, ANOVA was conducted using the post-survey comfort data to determine whether preservice teachers reported different levels of comfort working with students of different disability categories after completing their initial coursework and field experience in special education. As was the case previously, the post-survey comfort data violated the sphericity assumption (Machly's $W = .133$; $\chi^2(35) = 199.832$; $p < .001$) prior to ANOVA testing. Therefore, the degrees of freedom used for ANOVA significance testing were adjusted using the Greenhouse-Geisser correction.

The within-subjects ANOVA for the post-survey comfort data was significant ($F=5.538$, 564.872) = 14.432 ; $p < .001$), indicating that preservice teachers did report significantly different levels of comfort working with students across disability categories. After completing coursework and working with students with disabilities in field experiences, the preservice teachers reported being most comfortable working with students with Learning Disabilities ($M = 4.24$; $SD = 0.81$) and students on the Autism Spectrum ($M = 4.18$; $SD = 0.95$). Post-hoc t -test comparisons confirmed that the preservice teachers reported a significantly greater level of comfort working with students from the Learning Disabilities and Autism Spectrum Disorders categories than for students from any of the following disability categories: Behavior Disorders; Blind and Low Vision; Deaf and Hearing Loss; Low Incidence/Multiple Disabilities; Physical/Health Disabilities.

Coursework vs. Field Experience. When asked if the coursework or field experiences most significantly increased their *knowledge* of students with disabilities, 18 participants (53%) indicated the coursework and 11 (32%) indicated field experiences as most influential. The remaining 5 (15%) indicated both as being equally influential. Those participants citing field experiences offered such explanations as “The course gave me a basic understanding of the disabilities. However, the field experience allowed me to have personal, hands-on experience with students with disabilities and allowed me to connect what I had learned through coursework to real life situations and people.”

When asked if coursework or field experiences most significantly increased their *comfort level* teaching students with disabilities, responses indicated unanimous agreement that field experience, either alone or coupled with coursework, influenced their level of comfort the most. Thirty participants (88%) indicated that field experience was most influential. For example, one participant explained “While we can learn materials from a book, the best way to understand a disability is to work directly with someone who has that disability.” The remaining 4 participants (12%) recognized both coursework and field experiences equally with comments such as “My comfort level was increased by knowledge from my course and my field experience. I got confidence from learning about disabilities and became comfortable spending time with the kids.”

Knowledge vs Comfort. The final research question examined how preservice teachers distinguished between knowledge and comfort. Two themes emerged during analyses of qualitative data-- Comfort as Feeling at Ease and Experience is Essential for Comfort. Although

these themes were interconnected and sometimes overlapped, each time a particular word or phrase was used, it was labeled and counted separately.

Comfort as Feeling at Ease. When asked what it means to feel comfortable, participants consistently communicated the idea of comfort as being at ease. While the actual word ‘ease’ was used 10 times, synonymous terms such as relaxed (9 times) and safe or secure (7 times) were also used. Similarly, the concept of comfort meaning at ease was described 7 times using an antonymous phrase such as without worry/stress/anxiety or not tense/nervous. The connection between comfort and confidence was expressed 10 times. For example, one participant stated, “To feel comfortable means to feel at ease when participating in something and feeling confident doing it.”

Comfort was identified as a feeling nine times while knowledge was defined as information (4 times), facts (2 times) or skills (2 times). Four participants associated comfort with the application of knowledge making comments such as “Comfort is understanding what you know so that you can apply it with confidence.” Additionally, several participants distinguished knowledge from comfort by the fact that knowledge can be learned. For instance, one participant stated that, “The difference between knowledge and comfort is that comfort cannot be taught in the [university] classroom. You can only get that by being in that environment.” Another commented that “Comfort isn’t something you can study.”

Experience as Essential for Comfort. More experience was identified 19 times as a factor that would contribute to both greater knowledge and comfort regarding students with severe disabilities (i.e., deaf, blind, multiple disabilities, etc.). Identified as ‘field experience,’ ‘hands-on learning,’ and ‘working with these students one-on-one,’ this common notion was simply, but emphatically, communicated by one participant’s response – “Experience, Experience, Experience!!!” It was noted, however, that various experiences with specific types of disabilities are needed. As one participant stated, “I have not worked with any students who are deaf or that have hearing impairments. Despite learning about these disabilities, I do not feel that I am knowledgeable or comfortable teaching those students because I’ve never personally worked with students with those disabilities.”

Further, participants seemed to recognize the need for quality experiences as opposed to simple exposure. One participant observed that, “Field experience helped with my comfort level because I was able to be submerged in an environment that was welcoming, exciting, and fun. I enjoyed working with both the students and teachers.” While another remarked that, “Making sure that the schools used have effective Special Ed teachers for us to learn from is very important.”

Discussion

An investigation of initial special education experiences on elementary preservice teachers’ knowledge and comfort level regarding students with disabilities, revealed a significant increase in the preservice teachers’ *knowledge* across all disability categories from the beginning of the semester to the end. Regarding their reported *comfort* level, a significant increase occurred across all disability categories except Behavior Disorders.

Although the preservice teachers' level of comfort working with students with behavior disorders did increase after participating in initial special education training, the increase was not statistically significant. This finding was interesting because other researchers have reported similar findings (Abrams, 2005; Niesyn, 2009). For example, Cassady (2011) found general education teachers were less willing to include students with behavior disorders than students with autism. Another reason this finding was interesting is because the participants had only completed their initial training in special education and still needed to complete additional coursework and field experience in behavior management. Further examination as to how the participants would rate their knowledge and comfort level following another semester of field experiences and coursework would be helpful to determine if their comfort level working with students with behavior disorders would differ as a result of more training.

Preservice teachers described comfort as a feeling of ease and confidence. While the participants in this study gave some indication that one's level of knowledge could contribute to one's comfort level ('Knowledge can give you comfort most of the time, but comfort cannot give you knowledge. '), they overwhelmingly cited direct experience as a positive influence on their comfort level in working with students with disabilities. In addition, the participants recognized that quality, well-supported field experiences with passionate educators as instructors and mentors were fundamental elements of an effective teacher preparation program. Additional research examining the components of the field experience that contribute to preparing teachers to feel comfortable and skilled to teach in an inclusive setting is still needed.

In summary, field experiences with students with disabilities seem to be a vital factor in preparing teachers to become more knowledgeable and comfortable meeting the needs of students with disabilities in inclusive settings. These findings are consistent with previous studies linking field experiences to improved perceptions and preparedness of teaching students with disabilities (de Boer, A, Pijl, S. J, & Minnaert, A. 2011; Lancaster & Bain, 2010; Leyser et al., 2011). The results from this study support the need for teacher education programs to provide field experiences and coursework in special education to all pre-service teachers to ensure they develop the skills and comfort level required and promote inclusive classroom environments.

Limitations

Certain limitations should be noted. One is the small sample size of participants. Also, the findings are limited in generalizability due to the use of a convenience sample of elementary preservice teacher from one program as well as the somewhat homogenous demographics of the participants. In addition, the self-reporting nature of survey research is a limitation in itself which leads to problems with the generalizability and validity of the results. Further, the survey and questionnaire used were developed by the researchers and were not validated instruments. Finally, no comparison group was used to examine how the results obtained in this study compare to a similar group of participants in a more traditional teacher preparation program.

Conclusion

Despite these limitations, the results of this study show that a teacher preparation program can provide elementary preservice teachers with the coursework and field experiences necessary to

impact their perceptions of preparedness to teach students with disabilities. Positive attitudes toward inclusion are necessary for successful implementation, and the participants in this study showed a significant positive increase in their knowledge and comfort level regarding students with disabilities. Examining preservice teachers' perceptions is one way that teacher preparation programs can ensure that all teacher candidates graduate with confidence in their abilities to facilitate success for all their students when teaching in an inclusive setting.

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APPENDIX A
PRE-POST SEMESTER SURVEY

1. Rate your current knowledge of the following disabilities:

	1= no knowledge	2=somewhat knowledgeable	3=no opinion	4=knowledgeable	5=very knowledgeable
Intellectual Disabilities					
Physical/Health Disabilities					
Low Incidence/Multiple Disabilities					
Learning Disabilities					
Behavior Disorders					
Autism Spectrum Disorders					
Communication Disorders					
Deaf and Hearing Loss					
Blind and Low Vision					
Giftedness					

2. Rate your current comfort level in working with students with the following disabilities:

	1= not comfortable	2=somewhat comfortable	3=no opinion neutral	4=comfortable	5=very comfortable
Intellectual Disabilities					
Physical/Health Disabilities					
Low Incidence/Multiple Disabilities					
Learning Disabilities					
Behavior Disorders					
Autism Spectrum Disorders					
Communication Disorders					
Deaf and Hearing Loss					
Blind and Low Vision					
Giftedness					

APPENDIX B
FOLLOW UP QUESTIONNAIRE

1. What exactly does it mean to feel comfortable?
2. What is the difference between knowledge and comfort?
3. Which increased your *knowledge* of student with disabilities more, the coursework (EDU 313) or field experience?
4. Which increased your *comfort level* teaching students with disabilities more, the coursework (EDU 313) or field experience?
5. What could be done to gain greater knowledge and comfort with teaching students with more significant disabilities such as students with multiple disabilities, deafness, or hearing impairments?

But... How Helpful is That? Parents' Views on the Helpfulness of Selected Resources When Making Educational Decisions for Their Young Children with Disabilities

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Abstract

Q-methodology was used to explore parents' views on the helpfulness of selected resources when making educational decisions for their young children with disabilities. Parents' determination to get what was best for the child and school staff who understood the child's disabilities averaged the highest scores. Children's age and type of disability seemed to influence parents' perceptions of the helpfulness of specific resources. However, participants agreed that each one of the selected resources could be helpful to them at some point in their journey to secure adequate education and services for their children. By-person factor analysis identified three distinctive viewpoints on the helpfulness of resources presented to participants: a) using a balanced combination of internal and external resources, b) preference for internal or within-parent resources, and c) a focus on external resources. Parents suggested other resources that they thought would help them when making decisions about their children's education.

Key words: resources, educational decisions, parents, young children with disabilities

But... How Helpful is That? Parents' Views on the Helpfulness of Selected Resources When Making Educational Decisions for Their Young Children with Disabilities

Participation in the educational decision-making process is by far the most distinctive component of parental involvement among parents of children with disabilities. While parental involvement in school-related activities has an undeniable positive effect on the academic achievement of children with disabilities (McDonnall, Cavanaugh, & Giesen, 2010; Miedel & Reynolds, 2000; Trainor, 2010a), the repercussions of parental participation on these students go beyond what most professionals picture when thinking of typical children. Besides being a legal right (IDEA, 1997; IDEIA, 2004), parental participation in decisions regarding the education of young children with disabilities has the potential to increase school personnel's compliance with the special education process. In turn, this may improve the quality of the education that the student receives (Trainor, 2010b) and reduce parental stress (Burke & Hodapp, 2014). Unfortunately, being part of the educational decision-making process can be a daunting task for parents due to their limited expertise in matters related to the education of children with disabilities (Hughes,

Valle-Riestra, & Arguelles, 2008; Olmstead et al., 2010) and the multiple challenges associated with raising a child with a disability (Breitkreuz, Wunderli, Savage, & McConnell, 2014; Vanega & Abdelrahin, 2016). As a result, each parent must develop his or her plan of action for approaching such decisions: they identify *internal* (within-parent) and *external* (outside-parent) resources available to them and choose when and how to use them.

A Word on Advocacy

Parents' participation in educational decisions about their children with disabilities is often viewed as advocating for the child. Despite the term not being specified in the law, some experts agree that the spirit of the Individuals with Disabilities Education Act, or IDEA, implies the exercise of parental advocacy (Kalyanpur, Harry, & Skrtic, 2000; Trainor, 2010a). IDEA requirements (e.g., necessary parental consent before evaluation placement of children in special education) compel parents to constantly consider how their children's educational needs will be addressed. Throughout this process, parents are expected to share their impressions about their children's strengths and weaknesses and to collaborate with professionals in selecting the best educational approach and services for their children. This form of involvement is not usually expected of parents of children without disabilities.

Parents' abilities to advocate for their children with disabilities can vary significantly. Trainor (2010b) described four approaches to parental involvement among parents of children with disabilities: (a) the intuitive advocates, (b) the disability experts, (c) the strategists, and (d) the change agents. Each approach involves varying levels of involvement in educational decision-making and styles of advocacy. For instance, *intuitive agents* share knowledge about their children with disabilities (e.g., preferences, dislikes, talents) with educators. Unfortunately, due to the tendency among professionals to disregard this type of information, these parents' participation in educational decisions is limited. *Disability experts* incorporate knowledge of their children's disabilities into their interactions with school professionals and seek to connect with other parents of children with disabilities to combat feelings of isolation. They are actively involved in deciding about their children's education and are more likely to develop a collaborative relationship with professionals than their intuitive counterparts. *Strategists* are very knowledgeable about laws and procedures and have a thorough understanding of their rights to advocate for their children with disabilities. They regularly supervise their children's educational programs to ensure they are being followed and create a place for themselves in the decision-making process. Last, *change agents* go beyond advocating for their children; they pursue systemic changes and sacrifice personal time to secure a better experience for other families. According to Trainor, these four approaches are used by parents across race and ethnicity, with socioeconomic status and type of disability (especially autism) being the most influential factors in parents selecting one approach or the other. That is, although greater levels of advocacy usually result in more effective parental involvement and better educational outcomes for young children with disabilities, not all parents engage in the same manner in the decision-making process nor rely on the same resources when making decisions about the education of their children with disabilities.

Selecting Resources

Research has shown that parents of young children with disabilities use a myriad of resources (i.e., supports and strategies) when deciding about their children's education. Although all

resources identified by research are presumably valuable, parents rely on some resources more than others depending on their personality, the availability of each resource, the current needs of the child, and their family culture, among other factors. Tetreault et al. (2014) identified nine types of supports available to parents of children with disabilities: informational support; assistance and support with decision making; legal support; financial support; educational support; psychosocial support; assistance with daily living activities; leisure, sports, and social activities interventions; and transportation. Parents of young children with disabilities usually rely on family members and close friends for emotional support and practical help (e.g., babysitting, running errands related to the child) and count on professionals to provide information and technical assistance for meeting their children's needs (Garwik, Patterson, Bennett, & Blum, 1998; White & Hastings, 2004). They may view staff from the agencies servicing their children and families (Hiebert-Murphy, Trute, & Wright, 2011; Litt & McCormick, 2015; Sloper, Greco, Beecham, & Webb, 2006), as well as professionals consulted outside school (Brown, Moraes & Mayhew, 2005; Heiman, 2002; Rahi, Manaras, Tuomainen, & Hundt, 2004; Sheppard & Vitalone-Raccaro, 2016), as sources of support in understanding their children's health and educational needs. At the same time, parents may view family support services as a resource that helps them enhance their sense of well-being (Freedman & Boyer, 2000) and ability to cope with the trials and tribulations that usually come with having a young child with disabilities. Parents may view school personnel as valuable resources, especially if schools make their family's expectations and dreams for the child a priority, and respect for the family's culture and values is evident during educational planning (Bailey, Hebbeler, Scarborough, Spiker, & Mallik, 2004; Burke & Hodapp, 2014; Fish, 2008). As their trust in school personnel's knowledge about the child's disability (Hess, Molina, & Kozleski, 2006) and special education laws (Lake & Billingsley, 2000) solidifies, parents might expect educators to teach them about their children's educational needs and the procedures involved in making adequate and responsive decisions for their children (Hughes et al., 2008; Zionts, Zionts, Harrison, & Bellinger, 2003). Also, whether it is through participation in support groups (Mandell & Salzer, 2007) or more casual conversations (Ainbinder et al., 1998), parents may depend on formal and informal interactions with other parents of children with disabilities, to access information and supports that professionals and family members cannot provide.

Besides using the resources mentioned above, parents of young children with disabilities often turn within themselves for inspiration. They make use of their inner strength, motivation, and personal strategies to support themselves through the educational decision-making process. Parents' inner strength, positive emotional state, and determination to secure necessary services for their children help them persevere in their efforts to be active participants in all aspects of their children's lives, including their education. For example, research has shown that, compared to parents with pessimistic views of their child's disability, parents who are curious about it, and resolute to do what is best for the child, participate more in their children's education (Granger, des Rivieres-Pigeon, Sabourin, & Forget, 2010; Ingber, Al-Yagon, & Dromi, 2010). These internal resources can facilitate parents' participation in educational decisions about their children while improving their abilities to use external resources. Similarly, parents' subjective perceptions of professionals' attitudes toward their child and family influence the choices they make for their children (Zionts et al., 2003) and willingness, or lack thereof, to collaborate with schools (Lake and Billingsley, 2000). Finally, their understanding of their children's disabilities (Brown et al., 2005), special education laws (Fish, 2008; Spann, Kohler, & Soenksen, 2003), and

available services and programs (Hess et al., 2006) can ultimately empower parents to advocate and make sounder educational decisions for their children (Trainor, 2010b).

Parents' choice to rely on a particular resource might indirectly affect the decisions they ultimately make for their children. While not all parents of young children with disabilities have access to every identified resource, they are likely to have a viewpoint about how specific resources would help them decide about their children's education. To facilitate parents' involvement in their children's educational decision-making process, professionals providing health, psychological, social, or educational services to young children with disabilities and their families must understand the value that individual parents are likely to assign to different resources.

This study aimed to explore parents' viewpoints on the relative helpfulness of selected resources when making educational decisions about their young children with disabilities. The following research questions guided our inquiry:

- What resources do parents find most helpful when making educational decisions for their young children with disabilities?
- What factors influence parents' views on the helpfulness of particular resources when making educational decisions for their young children with disabilities?
- How do viewpoints about the helpfulness of selected resources vary among parents of young children with disabilities?

Method

Participants

A purposive sample was used. Twenty-one ($n=21$) caregivers (20 parents and one grandparent acting as the legal guardian) of 3 to 5-year-old children with disabilities who received special education services in eight school districts within a single state were chosen as participants. Recruitment was open to parents of all racial, ethnic, and socioeconomic backgrounds. Participants were recruited through local clinics, family advocacy agencies' social media, a local newspaper, and newsletters from universities to which researchers were affiliated. Because this project was completed in the summer, schools and early childhood centers were not included. Although not a criterion for participation, all participants reported having interacted with an advocacy agency or support group since their children's disability diagnosis. Participation in this study was voluntary, and no compensation for participating was provided. For this study, all participants were referred to as *parents*. All parents kept their participant status throughout the project.

Eighteen participants were female, and three were male. Most participants ($n=17$) were Caucasian, two were African-American, and one was Latino. One participant did not disclose her ethnicity. Participants were relatively young, with only three being 45 years old or older. All participants had post-high school education or had graduated from a higher education institution. Participants' children with disabilities consisted of 10 girls and 11 boys; they were three ($n=7$), four ($n=7$), or five ($n=7$) years of age. Participants' children had diagnoses of autism ($n=10$), developmental delay ($n=3$), intellectual disabilities ($n=4$), physical disabilities ($n=3$); and multiple disabilities, reported by the parent as a "combination of developmental delay with orthopedic and visual impairments", ($n=1$).

Procedure

Q-methodology was utilized to collect and analyze data on parents' views on the helpfulness of selected resources when making educational decisions for their children with disabilities. Q-methodology is a ranking technique used to identify an individual's subjective viewpoint on a topic (McKeown & Thomas, 1988). The goal of Q-methodology is not to generalize findings to a population but to develop insight about different points of view that groups of people may have about a particular subject (Coogan & Herrington, 2011; Watts & Stenner, 2012). Studies using Q-methodology typically have samples of 20 to 100 participants (Tractinsky & Jarvenpaa, 1995); thus, the use of small samples is considered appropriate in studies involving Q-methodology.

Q-methodology has been used to collect data in studies involving families of children with and without disabilities (e.g., Ayvazoglu, Oh, & Kozub, 2006; Bakermans-Kranenburg, van IJzendoorn, Bokhorst, & Schuengel, 2004; Caldera & Lindsey, 2006; Gane et al., 2010; Roberts, 1986; Stanley-Gane, Flynn, Neitzel, Cronister, & Hagerman, 1996). It is a valuable tool for collecting information in early intervention because of its ability to assess individuals' predilections and shared perspectives along a continuum of significance (Sexton, Snyder, Wadsworth, Jardine, & Ernest, 1998), which makes it a perfect choice for the present study.

Consistent with Q-methodology, a Q-set was created to represent selected resources, and a Q-sort was used to collect data. Q-methodology then provided a structure for forcing participants to rank the helpfulness of the selected resources when making educational decisions for their children with disabilities, even if they had previously perceived them as being similarly helpful (Stephenson, 1953). Also, Q-methodology allowed us to explore participants' viewpoints holistically and to look closely at the resources that may seem helpful to different groups of parents.

Q-set design. As part of creating the Q-set for this study, the researchers conducted a review of the literature. Internet searches of ERIC, Google Scholar, Questia, and MEDLINE were performed using combinations of keywords: "helpful", "resources", "supports", "strategies", "challenges", "parents/families", "children with disabilities", "education", and "services". The articles selected described a) resources used by parents while navigating the special education system and coping with their children's disabilities, or b) challenges faced by parents while taking part in the special education process.

Ultimately, the review consisted of 30 articles published in 25 professional journals in special education, psychology, and health sciences. Information on parents' resources was summarized and used to generate the items in the Q-set. An initial set of 31 items was created. A panel of special educators, related services professionals, and parents of children with disabilities who would not be participating in the study examined the items to determine their social validity. Items were combined or restated to represent distinctive resources. Statements were written in a positive tone to avoid introducing bias into the sorting procedure. After multiple revisions, 16 items remained. Each item was printed on a separate card. The final Q-set comprised five internal and 11 external resources.

Q-sort administration. Three researchers were trained in the Q-sort administration technique to ensure consistency in data collection. To facilitate participation, data were collected at a location

selected by each family. Participants were asked to read all Q-items and think of those statements as resources that might be helpful to them when making decisions about their children's education. Then, the researchers read scripted instructions aloud to guide participants through the ranking of resources. Each column on the Q-sort represented a value ranging from one, least helpful, to 7, most helpful (see Figure 1). Items were assigned the value that matched their placement on the Q-sort. Q-sort data were transferred to a data sheet. Data sheets were numbered to ensure anonymity, and demographic information was collected.

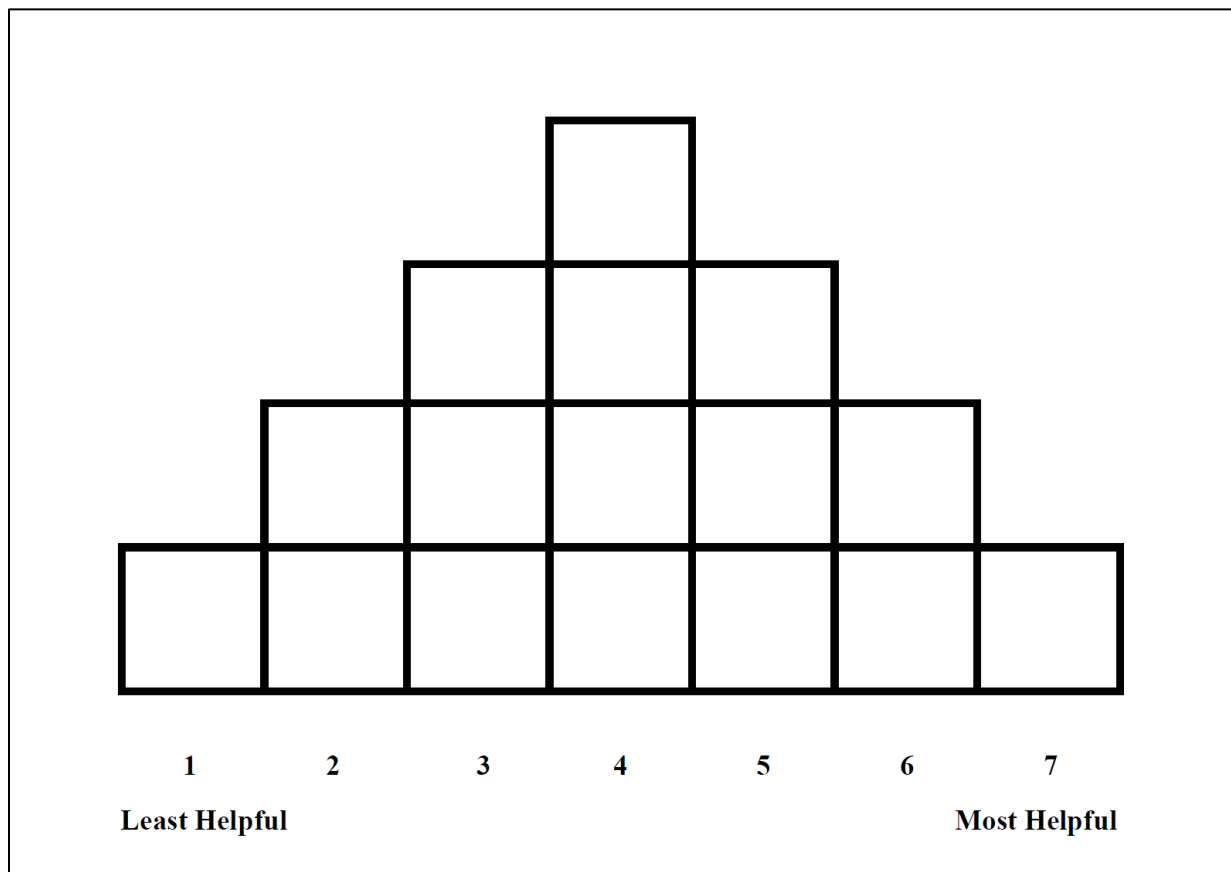


Figure 1. Q Sort Board

After completing the Q-sort activity, parents had the opportunity to share commentary on the selected resources or to suggest other resources that were, or would be, helpful to them when making educational decisions for their young children with disabilities. The researchers recorded participants' comments and suggestions for future analysis.

Data Analysis

Descriptive statistics were used to determine the items that ranked highest and lowest among participants. Mean, mode, standard deviation, and percentages were calculated for each item. Based on these data, a general ranking was generated to show resources found to be most-to-least helpful to parents when deciding about their children's education. Possible associations between demographic information and participants' ranking of resources were explored.

To develop insight into individual participants' viewpoints on the helpfulness of the selected resources when making educational decisions for their children with disabilities, Q-sort data were entered into the PQ Method, a statistical analysis software dedicated to Q-methodology. Q-sorts were intercorrelated and factor-analyzed following the *factor-per-number of participants* guidelines provided by Watts and Stenner (2012). Factors were inspected for eigenvalues of 1 or higher (Kaiser-Guttman criterion) and the presence of at least two highly loaded Q-sorts (Brown, 1980). A Varimax rotation was performed, and a correlation matrix of all Q-sorts was created using a by-person factor analysis to compare the viewpoints collected in the Q-sorts. Single Q-sort configurations representing each factor (i.e., factor arrays) were calculated using a weighted averaging procedure and used as the basis for interpreting the data provided by that factor. Finally, the preferences of participants whose Q-sorts loaded (i.e., were highly correlated) in a factor were summarized in a narrative describing the viewpoint expressed by that factor. Demographic information was included to aid interpretation.

Comments about selected resources and suggestions for additional resources made by participants after completing the Q-sort were segmented and organized using an open coding system (Creswell & Poth, 2017). Comments and suggestions were assigned to separate categories. Within each category, participants' contributions were grouped into themes. Data were analyzed for contributing factors or intervening conditions that might have influenced participants' responses and for information that could facilitate the interpretation of the viewpoints identified during the analysis of Q-sort data.

Findings

Most Helpful Resources

Overall, having school staff who understood the child's disability and parents' determination to get what was best for their children received the two highest scores, making them the most helpful resources for parents when deciding about the education of their young children with disabilities. Resources considered least helpful included parents' involvement with support groups; having school staff who respected families' values and cultures; and educators' understanding of special education laws. Standard deviations for Q-sort items ranged between 1.1 and 1.97, suggesting low to moderate variability among participants' rankings (see Table 1).

Table 1
Overall Resource Ranking

Ranking	Item Description	<i>M</i>	<i>SD</i>	Mode	Top Three %	Bottom Three %
1	School staff who understand my child's disability. (E)	5.38	1.24	6	76	5
2	My determination to get what's best for my child. (I)	5.38	1.26	5	71	0
3	My understanding of my child's disability and needs. (I)	5.00	1.18	4	57	5
3	My knowledge about services and programs for my child. (I)	4.57	1.16	5	57	19
3	School staff who include me as an equal member of the team. (E)	4.33	1.46	5	57	24
4	A positive attitude from school staff about my child and family. (E)	4.62	1.43	5	52	24
5	School staff who have high expectations for my child. (E)	4.24	1.14	5	47	24
6	School staff who work together as a team. (E)	4.24	1.26	4	38	24
7	Someone I trust who helps me make decisions about my child's education. (E)	3.76	1.97	3	33	57
8	School staff who care about my dreams for my child. (E)	3.71	1.1	3	19	47
8	My understanding about the special education law. (I)	3.62	1.56	4	19	43
8	My understanding of parents' rights and responsibilities. (I)	3.57	1.28	4	19	57
8	Discussions with professionals outside the school. (E)	3.43	1.5	3	19	43
9	School staff who understand special education laws. (E)	2.95	1.36	3	10	76
9	School staff who respect my family's values and culture. (E)	2.67	1.28	2	10	81
9	My involvement with parent support groups. (E)	2.52	1.47	2	10	71

Factors that Possibly Influenced Parents' Views on Resources

Once data were disaggregated by age and type of disability (autism, cognitive and physical disabilities, and speech and language disorders) of participants' children, minor but tangible differences in the rankings of resources among subgroups became evident. For example, compared to parents of four and five-year-olds, parents of three-year-olds gave higher rankings to resources such as determination to get what was best for the child and knowledge of services

and programs. At the same time, parents of five-year-olds were the only group ranking understanding of the special education law as one of the top-three helpful resources (see Table 2).

Table 2
Resources Ranked by Child's Age.

Child's Age	Most Helpful Resources	Least Helpful Resources
3	<ol style="list-style-type: none"> 1- School staff who understand my child's disability. 2- My determination to get what's best for my child. 3- My knowledge about services and programs for my child/ My understanding of my child's disabilities and needs. 	<ol style="list-style-type: none"> 1- My involvement with parent support groups. 2- School staff who understand special education law / School staff who respect my family's values and culture.
4	<ol style="list-style-type: none"> 1- School staff who understand my child's disability. 2- School staff who include me as an equal member of the team. 3- Someone I trust who helps me make decisions about my child's education. 	<ol style="list-style-type: none"> 1- My involvement with parent support groups. 2- School staff who understand special education law.
5	<ol style="list-style-type: none"> 1- School staff who understand my child's disability. 2- My understanding of special education law. 3- My understanding of my child's disability and needs. 	<ol style="list-style-type: none"> 1- School staff who respect my family's values and culture. 2- My involvement with parent support groups. 3- Discussions with professionals outside school / Someone I trust to help me make decisions about my child.

Additionally, variations were noticed in parents' assessments of the helpfulness of certain resources according to their children's disabilities. Specifically, school staff's understanding of the children's disabilities was ranked as one of the three most helpful resources by 70% of parents of children with autism compared to only 36% of parents of children with cognitive and physical disabilities.

Parents' Viewpoints on the Helpfulness of Resources

Analysis of the distribution obtained from participants' rankings shed light on parents' viewpoints regarding the helpfulness of selected resources when making educational decisions

for their children with disabilities. Four factors were initially extracted. Nevertheless, after inspecting factors for eigenvalues and the presence of highly loaded Q-sorts, one factor involving five participants was excluded for not meeting criteria. Sixteen ($n=16$) of the 21 Q-sorts loaded significantly on one of the three remaining factors which, together, accounted for 56% of the variance (see Table 3).

Table 3
Factor Q-Sort Values for Each Statement

Item #	Statement	Factor Arrays		
		Factor 1 <i>Balanced combination</i>	Factor 2 <i>Up to us parents</i>	Factor 3 <i>All about them</i>
		Scores		
1	School staff who understand my child's disability.	7	4	5
2	School staff who understand special education laws.	2	4	2
3	My understanding about the special education law.	2	7	3
4	My understanding of parents' rights and responsibilities.	3	5	3
5	My knowledge about services and programs for my child.	5	6	4
6	My understanding of my child's disability and needs.	6	5	3
7	Discussions with professionals outside the school.	3	3	4
8	School staff who work together as a team.	4	5	6
9	School staff who include me as an equal member of the team.	4	4	7
10	Someone I trust who helps me make decisions about my child's education.	5	2	1
11	My involvement with parent support groups.	1	3	2
12	School staff who have high expectations for my child.	4	4	5
13	School staff who care about my dreams for my child.	4	3	6
14	School staff who respect my family's values and culture.	3	1	4
15	My determination to get what's best for my child.	6	6	4
16	A positive attitude from school staff about my child and family.	5	2	5

Significant correlation coefficients between variables and factors ranged from .50 to .85; sixty-three percent of the factors loaded within the $p < .01$ significance level (.65 or higher). The viewpoints identified in the analysis included:

A balanced combination of internal and external resources. This viewpoint found parents' internal resources to be as helpful in making educational decisions for their children with disabilities as external resources accessed through professionals and specialized social networks. Nine participants ($n=9$) shared this viewpoint, which had an eigenvalue of 7.00 and explained 26% of the study variance. Parents identified themselves as Caucasian; seven were female, and two were male. Their average age was 36 years, and the average age of their children was three years and ten months. Five of the children were boys, and four were girls. Six of the children had autism, and three had orthopedic impairments or intellectual disabilities.

Parents sharing this viewpoint considered their understanding of the child's disability and needs (6: 6), determination to obtain what was best for the child (15: 6), and knowledge of services and programs (5: 5) to be almost as helpful as having access to school staff that understood their child's disability (1: 7). They viewed having somebody they trusted to help them make educational decisions for their children (10: 5) as being more helpful in decision-making than participating in support groups (11: 1), having discussions with professionals outside school (7: 3), knowing about special education laws (3: 2), or understanding of their own legal rights and responsibilities (4: 3). These parents ranked school staff's general attitudes toward the child and family (16: 5) relatively high, but they did not consider teachers' positive attitudes to their family's culture and values (14: 3) to be as helpful. Compared to the other two viewpoints, these parents gave the lowest scores to staff's ability to work together (8: 4) and willingness to include parents as equal members of the team (9: 4).

It's up to us parents. This viewpoint assigned a considerably greater value to parents' internal resources than to external supports offered by professionals and structured socialization. Four parents shared this viewpoint, which had an eigenvalue of 2.23 and explained 15% of the study variance. All were female; two were African-American, and the other two were Caucasian. One parent omitted information about her age; therefore, the average age for this group could not be calculated. Age information provided by the other three parents ranged from mid-forties to late-sixties. The average age of their children was four years and six months. Two children were boys, and two were girls. One child had autism, and three had orthopedic impairments or intellectual disabilities.

Parents embracing this viewpoint considered their understanding of special education law (3: 7), knowledge about services and programs (5: 6), and determination to get what was best for the child (15: 6) to be the most helpful when making educational decisions for their young children with disabilities. Compared to the other two groups, these parents also assigned greater value to their understanding of parental rights and responsibilities (4: 5). They considered external resources involving school staff and other professionals less helpful than internal ones. Of all viewpoints, they credited the lowest value to school staff's positive attitude about the child and family (16: 2), respect for the family culture and values (14: 1), and consideration of parents' dreams and goals for the child (13: 3). Two exceptions to this tendency to favor internal over

external resources were their appreciation of school staff's understanding of special education laws (2: 4) and willingness to include parents as part of the team (9: 4). Although neither resource was described as "most helpful", they received a higher ranking from these parents than from parents who held the other two viewpoints collectively.

It's all about them. This viewpoint emphasized the helpfulness of external resources, specifically those associated with school staff's attitudes and actions to help parents make educational decisions for their young children with disabilities. Three participants ($n=3$) embraced this viewpoint, which had an eigenvalue of 2.52 and explained 15% of the study variance. One parent was Caucasian, one Latino, and one African-American. Two parents were female, and one was male. Parents' ages averaged at 39 years, and their children's ages averaged at three years and eight months. Two of the children were girls, and one was a boy. One child had autism, and the other two had orthopedic impairment or intellectual disabilities.

Parents who identified with this viewpoint assigned top scores to resources such as having school staff that treated them as equal members of the team (9: 7), worked together (8: 6), cared about parents' dreams and goals for the child (13: 6), had high expectations for the child (12: 5), and showed a positive attitude towards the child and family (16: 5). They assigned working with school staff that respected the family culture and values (14: 4) a greater score than 81% ($n=17$) of the study sample. They considered their understanding of their child's disability (6: 3) and knowledge of special education laws (3: 3) to be less helpful in educational decision-making than resources associated with professionals' knowledge, attitudes, and actions. They ranked their determination to get what was best for the child (15: 4), understanding of the child's disability and needs (6: 3), and knowledge of services or programs (5: 4) lower than did parents holding the other two viewpoints.

Parents' Commentary and Suggested Resources

Qualitative data gathered from parents upon completion of the Q-sort provided further insights into their views on the helpfulness of these and other resources when making educational decisions for their children. All parents expressed two common sentiments: (a) all selected resources could facilitate parents' decision-making at some point in their journey to secure appropriate education and adequate services for their children and (b) the absence of these resources might delay parents' abilities to make suitable educational decisions for their children with disabilities. Four themes emerged from the added resources suggested by parents.

Parents' and educators' advocacy skills. Two parents discussed the importance of parents and teachers developing sound advocacy skills and highlighted the difference between knowing about laws and procedures and advocating for a child with disabilities. One of them spoke specifically about the helpfulness of formal advocacy training in teaching parents how to use what they knew to "make things happen."

Having informal interactions with other parents in the community. A parent of a child with a physical disability highlighted the helpfulness of informal networking and spontaneous interactions with other parents, as opposed to interactions that occurred as part of their participation in parent meetings. She elaborated that through those interactions she had learned about inclusive services and programs and felt more connected to her community.

Having more support from the community. The parent of a child with autism discussed how living in a community that accommodated the needs of all children would empower families to extend the education of their children with disabilities outside the classroom, allowing parents to focus on their long-term educational goals for their children rather than fixing on the “small picture”.

Having teachers adequately prepared to teach children with disabilities. Three parents of children with intellectual disabilities ($n=2$) and autism ($n=1$) spoke about the need for teachers to be better trained in special methods for teaching young children with disabilities. They emphasized that having professionals who understood and respected the law was helpful only if those professionals also knew how to work with the children.

Discussion

In this study, parents' determination to get the services their children need and having school staff who understood the child's disability received the highest rankings for their helpfulness to parents when making educational decisions for their children. However, parents' circumstances seemed to influence their appreciation of specific resources. The age of the child appeared to shape parents' perceptions of the helpfulness of specific resources, with parents of 3-year-olds focusing on informational resources; parents of 4-year-olds relying more on external supports; and parents of 5-year-olds attributing greater value to within-parent resources such as including their own knowledge of educational laws and procedures.

Earlier research indicates that the support needs of families with children with disabilities vary according to numerous issues resulting from changing family dynamics, (Wang & Brown, 2009). Therefore, the variations in parents' views on specific resources noticed in this study may reflect (a) the stage through which parents are going after learning about their child's disability or (b) the changing needs of children with disabilities as they go through various stages of development. Parents of younger children may still be making sense of their children's diagnoses and figuring out how to respond to their new reality. They may view disability information as being more helpful than resources associated with legal aspects of their children's education because understanding their children's condition and needs is their most immediate priority. However, by the time the child is five years of age, parents feel the pressure to consider educational options for their children and may realize the importance of becoming well-versed in special education laws and having a voice in the educational decisions made for their children with disabilities. This may be particularly true for parents who have had enough time to work through their initial reactions to their children's disability diagnoses or whose children have been receiving services for a while.

Previous studies connected educators' limited knowledge of, and compliance with, special education procedures with increased parental stress (Burke & Hodapp, 2014) and ongoing conflict between parents and educators (Lake & Billingsley, 2000; Wagner & Katsiyannis, 2010). Statistical significance of the tendencies observed in this study could not be determined due to the relatively small sample size. Still, the results suggest that parents of older children may have a greater understanding of the importance of having access to educators who are well

informed about the legal workings of the special education system. The difference in parents' views may result from the same process that parents seem to undergo when evaluating the helpfulness of their own knowledge of the legal aspects of special education. Alternatively, this variation may be related to feelings expressed by some parents regarding the importance of having teachers who can adequately teach students with disabilities. As discussed earlier, participants in this study assigned great value to teachers' understanding of disabilities. Therefore, despite seeing the value of working with teachers who are knowledgeable about the special education law, it makes sense that parents' main concerns would be related to teachers' abilities to effectively address children's educational needs. Future research on this subject should include having well-trained teachers as one of the selected resources in order to explore parents' comparative views on the helpfulness of this particular resource when making decisions about their children's education.

During this investigation, parents of children with autism placed a higher value on school staff's understanding of the child's disability than parents of children in the other disability categories. Research has documented the challenges that parents of children with autism face to gain access to professionals qualified to work with their children, and the adverse effects that such challenges have on parents' levels of satisfaction with their children's health and educational services (Montes, Halterman, & Magyar, 2009). Understanding the child's disability was considered a very valuable resource for parents. Having access to school staff who are knowledgeable about autism might seem indispensable for parents to be able to rely on educators to guide them through the decision-making process.

In addition, three distinctive viewpoints on the helpfulness of selected resources in educational decision-making were identified among participants. While the most popular viewpoint considered both internal and external resources to be similarly helpful, the other two viewpoints showed a preference for either within-person resources or external supports provided by professionals, particularly within the educational system. Consistent with results from the descriptive statistics analysis, the group of parents sharing the *It's all about them* viewpoint had younger children than parents who shared the *It's all about us* viewpoint, suggesting that parents' perceptions of selected resources may be modified by changes in their children's developmental needs. The different viewpoints identified in this exploration offered objective evidence of what many of us have seen in the field: despite proof of the helpfulness of specific resources, not all parents will judge such resources in the same light. Then, it is unlikely that all parents of young children with disabilities would perceive the value of such resources in the same way that educators and related services professionals do. For this reason, all professionals involved in the care and education of young children with disabilities must regularly monitor parents for changes in their needed support (Alsem et al., 2013). Educators and related services professionals must be prepared to guide parents even when these choose to rely on resources that, at that specific point in time, do not seem to adequately support them in making decisions about their young children with disabilities.

Because the lack of familiarity with Q-methodology (Sexton et al., 1998; van Exel, 2005) may drive readers to judge the relevance of this study's findings through the lens of more traditional methods of inquiry, it is important to emphasize that this study did not seek to provide an all-inclusive inventory of viewpoints held by parents of young children with disabilities. Instead, it

examined the viewpoints that parents within a demarcated group had on the relative helpfulness of selected resources when making educational decisions for their young children with disabilities. By adding to the current body of knowledge on parents' perceptions and viewpoints on the relative helpfulness of the selected resources, this study contributed to our understanding of the different ways in which parents of children with disabilities may approach educational decision-making and construe the helpfulness of various strategies and supports during that process. That five ($n = 5$) out of the 21 parents participating in the study did not conform with any of the identified viewpoints suggests that additional viewpoints on the subject may exist. Future studies should include larger and more diverse samples, to explore this assumption.

In the past, parents of younger children have attributed less significance to using support groups than parents of older children (i.e., children placed in upper grades) with disabilities (Mandell & Salzer, 2007). Still, in this study, participants' lower rankings of their involvement with support groups -irrespective of the children's age or disabilities- was an unexpected finding due to the relationship that all participants had with local disability advocacy agencies and support groups. This finding, combined with one participants' comment regarding the greater value of informal interactions with other parents over interactions occurring within structured meetings, suggests that parents of young children with disabilities may view support groups as a source of emotional nourishment rather than a source of guidance about the educational decisions they must make for their children.

Lastly, family cultural perspectives and life experiences are known to influence both parents' relationships with the educational system and responses to educators' expectations of the role of parents and school in the education of children with disabilities (Olivos, 2009). The limited emphasis that participants placed on the helpfulness of having school staff who understood their family culture and values might reflect the fact that most participants were Caucasian and, therefore, less likely to be affected by any potential deficit in cultural competence on the part of the educators.

Conclusion

Although participants in this study agreed that each of the selected resources would be helpful in their journey to secure adequate education and services for their children with disabilities, parents' determination to get what was best for the children, and parents' and teachers' understanding of the children's disabilities, obtained the highest scores as being helpful to parents when making educational decisions. Parents' views on the helpfulness of specific resources appears to be influenced by their children's ages and types of disabilities. Viewpoints on the helpfulness of selected resources varied among parents. Although most parents found it helpful to use a balanced combination of internal and external resources, other parents showed more polarized views and a tendency to favor mostly internal or mostly external resources when making educational decisions for their children with disabilities.

This study is unique because it provides a framework for understanding how parents' perceptions of the relative helpfulness of resources identified through decades of research fit within distinctive viewpoints of what helps them the most when making educational decisions for their children with disabilities. Likewise, this study serves as a stepping stone for future research on the resources that individual parents may be more likely to utilize at different points in their

children's educational decision-making process. Findings from this exploration remind us of the importance of (a) avoiding one-size-fits-all approaches to supporting parents of children with disabilities and (b) providing professionals involved in the education and care of young children with disabilities with a better understanding of different viewpoints about the helpfulness of resources that individual parents may hold, and their likelihood to rely on specific resources.

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An Investigation of Co-teaching to Improve Academic Achievement of Students with Disabilities: A Meta-analysis

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485-4502

Abstract

Co-teaching is a popular means to support students with disabilities in the general education classroom. However, despite its widespread use, there are no meta-analyses examining the effects of co-teaching on academic outcomes for secondary students that analyze both study quality (e.g., the Council for Exceptional Children's *Standards for Evidence-Based Practices in Special Education*) and effects. We addressed both of these gaps in the current review, identifying nine articles (10 experimental studies) that were analyzed for quality and effects. No studies met all of the quality indicators and study effects showed no significant impact on students' academic outcomes. Limitations and directions for research are presented. Implications for practice are also discussed, including the consideration that null effects, in this instance, do not necessarily suggest that co-teaching is ineffective.

Keywords: co-teaching, team teaching, least restrictive environment, IDEA, collaborative teaching, inclusion

An Investigation of Co-teaching to Improve Academic Achievement of Students with Disabilities: A Meta-analysis

The Individuals with Disabilities Education Improvement Act (hereafter IDEA, 2004) emphasizes educating students with disabilities with their same age peers to the maximum extent

appropriate. Additionally, the law requires that an individual education program (IEP) provides “an explanation of the extent, if any, to which the child will not participate with nondisabled children in the regular class...” (§1414 (d)(1)(A)(i)(V)). To illustrate current trends in the inclusion of students with disabilities, in 2014, 94.7% of students with disabilities ages 6 through 21 were educated in general education classrooms for at least some portion of the school day (U.S. Department of Education, 2016a). Additionally, 62.6% of students with disabilities were educated in the general education classroom 80% or more of the school day and only 5.3% were educated outside the general education classroom for the entire day. Thus, it appears the inclusion of students with disabilities in the general education classroom is happening as the law intended.

Success in integrated settings, particularly with regard to participation and progress in the general education curriculum, necessitates specific supports and modifications (McLeskey, Waldron, Spooner, & Algozzine, 2014). The recent passage of the Every Student Succeeds Act (ESSA) of 2015 mandated that all students with disabilities be held to the same academic state standards and assessments as their non-disabled peers. Historically, however, academic achievement of students with disabilities has been poor. For example, in 2013-2014, students with disabilities averaged just 32.5% proficiency in 8th grade state reading assessments, 29% proficiency in 8th grade mathematics, and have had a 64.6% graduation rate (U.S. Department of Education, 2016b).

To address the modest outcomes of students with disabilities and other historically low-performing students (e.g., students of color, those of low socio-economic status), congress and the research community, has embraced the use of evidence-based practices (EBPs; Cook & Odom, 2013). The authorization of the ESSA (2015) brought the term evidence-based to legislation, and with it, more definition than in the previous law, the NCLB, that only mandated the use of the vague term scientifically-based practice. Though the ESSA defined what an EBP is from a legal perspective in 2015, the previous decade saw organizations from the Department of Education’s Institute of Education Sciences (What Works Clearinghouse, 2014) to the Council for Exceptional Children (CEC, 2014) create standards by which to determine whether a practice has a sufficient evidence-base. Utilizing evidence-based practices (EBPs) is seen as necessary to create more successful educational programs and, in turn, improve the achievement of students who have been shown to be resistant to normal practices (for a more thorough treatment of the history of EBPs, see Cook & Odom, 2013).

In 2014, the Council for Exceptional Children released their *Standards for Evidence-Based Practices in Special Education* (CEC-EBP; 2014), which provide guidelines for both determining if a given research study is of high quality (e.g., strong internal validity, replicable practices) as well as determining if a body of literature contains sufficient evidence to be considered evidence-based. The standards cover eight domains that must be described in the study in a manner that would facilitate replication. The domains include: (a) context and setting, (b) participants, (c) intervention agent, (d) description of practice, (e) implementation fidelity, (f) internal validity, (g) outcome measures/dependent variables, and (h) data analysis. For a practice, to be considered evidence-based by these standards, it must have a sufficient number of high-quality articles – single-case (5 with 20 participants), group design (2 randomized

experiments with 60 participants), or a combination – with positive outcomes (see CEC, 2014 for more exhaustive criteria).

Co-Teaching

Co-teaching is a popular means to support students with disabilities in general education classrooms. Co-teaching typically involves a special education teacher and a general education teacher delivering instruction to students with and without disabilities in the regular classroom (Cook & Friend, 1995). There are six primary co-teaching models: one teach/one observe, one teach/one assist, parallel teaching, station teaching, alternative teaching, and teaming (Friend & Cook, 2013). For co-teaching to be successful, both teachers must also engage in co-planning to facilitate both teachers' ability to take an active role in the lesson (Arguelles, Hughes, & Schumm, 2000). Likewise, teachers need to adopt a shared responsibility for classroom duties, drawing on their own areas of strength, typically the general educator's content expertise and the special educator's strategic and differentiated instruction knowledge.

The most prevalent co-teaching model is one teach, one assist (see Cook, McDuffie-Landrum, Oshita, & Cook, 2017). This model is most often observed in classrooms and is characterized by traditional instruction though, there is limited research to support the effectiveness of this model. Similarly, Scruggs, Mastropieri and McDuffie (2007) found that instructional methods with research to support their effectiveness (e.g., peer mediation, strategy instruction, self-advocacy, and study skills training) were rarely utilized in co-taught classrooms. This is discouraging as it suggests a potential disparity in student's access to specially designed instruction in co-taught classrooms.

Unfortunately, there are several potential barriers to co-teaching (Scruggs et al., 2007). First, many teachers are not explicitly trained to co-teach. Another challenge is that it can be difficult to find time to plan together, an integral component of a successful co-teaching model, as co-planning requires a common meeting time. Another barrier to successful co-teaching is finding strategies and models that support learners with diverse needs (Scruggs et al., 2007). These challenges may be of greater significance at the secondary level (i.e., middle and high school; 6-12) where collaboration, in general, can be rife with challenges. Barriers to co-teaching in secondary schools are tied directly to the complexity of the upper grade levels, such as highly specialized curricula, increased accountability measures, and increased teacher autonomy (Dieker & Murawski, 2003). In addition, by the time students reach secondary grades, many possess splinter skills, which can be attributed to removal from instruction or a failure to reach mastery, resulting in a failure to generalize content from one grade level to the next. Despite its widespread use, researchers have cautioned against assuming that co-teaching is an effective or evidence-based practice for addressing the needs of students with disabilities (e.g., Murawski & Swanson, 2001; Weiss & Brigham, 2000).

Previous Reviews

Six previous reviews exist on co-teaching, ranging from the purely narrative (Weiss, 2004), to systematic syntheses of qualitative (Scruggs et al., 2007) and quantitative (Murawski & Swanson, 2001) studies. However, none provide a clear picture of the evidence-base for co-teaching. To begin, the Weiss (2004) article lacks a systematic framework with which to draw conclusions. Although strictly narrative reviews are useful in describing a body of literature, and

Weiss's work certainly adds to the understanding of co-teaching, they are prone to bias as they lack a systematic methodology (Cook, Mulrow, & Haynes, 1997). Similarly, Welch, Brownell, and Sheridan (1999) conducted a literature review of co-teaching research. However, their review focused only on one co-teaching model, team teaching, and was not directly tied to students with disabilities. Further, most of the identified studies were based on anecdotal reports for implementing models, not causal research, and they did not include replicable search criteria. A meta-synthesis of the qualitative literature, conducted by Scruggs, Mastropieri, and McDuffie (2007), discussed mixed results for co-teaching, particularly with respect to some of the methods that under-utilize the special education teacher (e.g., one-teach, one observe). Additionally, their review was primarily directed towards qualitative research, thus there was no effort made to determine the effectiveness of co-teaching compared to other methods.

Murawski and Swanson (2001) conducted the only meta-analysis of co-teaching. This meta-analysis found a moderate effect for co-teaching compared to controls. However, their meta-analysis included only six articles, and those articles varied considerably on the outcome measures and subject areas included, limiting the generalizability of the findings. Additionally, the meta-analysis did not evaluate study quality, nor include all publicly available studies (e.g., grey literature – dissertations, other non-peer-reviewed manuscripts). Most recently, Cook, Landrum, Oshita, and Cook (2017) provided an update on the Murawski and Swanson meta-analysis. However, their review was not specifically a synthesis, as it did not provide search criteria and simply updated studies from the Murawski and Swanson meta-analysis. However, they did apply the Council for Exceptional Children's *Standards for Evidence-Based Practices in Special Education* (2014), an important step in determining the quality of a body of research.

In sum, there are no current high-quality meta-analyses of co-teaching as a means of including students with disabilities in the general education setting. Therefore, the purpose of the current meta-analysis is to add to the existing literature by: (a) conducting a systematic review with the goal of complete transparency and replicability of methods; (b) assessing all studies against the CEC (2014) *Standards for Evidence-Based Practices in Special Education*; and (c) including all publicly available studies (as recommended by the CEC, 2014 guidelines). The current meta-analysis is informed by the following research questions:

Research Question (1): What is the extent of evidence provided by the co-teaching literature-base as measured by the CEC (2014) standards for evidence-based practices?

Research Question (2): What is the relative effect of co-teaching versus control conditions on student academic outcomes?

Method

To answer the research questions, a database search of the extant literature, including all publicly available studies on co-teaching with students with disabilities, was conducted. The database search was conducted on July 18, 2017 and included all previous dates. Four databases, Academic Search Premiere, Education Full Text, ERIC, and PsychINFO were searched utilizing the boolean phrase (["coteaching" OR "co-teaching"] AND ["middle school" OR "high school"] OR "secondary school" OR "junior high"). Hand searches were also conducted in the following

journals for the years 2007 through 2017: (a) *Exceptional Children*, (b) *Remedial and Special Education*, (c) *Teacher Education and Special Education*, and (d) *The Journal of Special Education*. These journals were identified from the database search as those most often including studies on the inclusion of students in special education in general education classroom settings. Finally, an ancestral search of the previous reviews on co-teaching was conducted by screening the reference list of included articles for any additional studies that met the inclusion criteria of this analysis.

Inclusion Criteria

To be included in the current meta-analysis, studies had to: (a) present findings from a quantitative study; (b) have co-teaching as an independent variable in isolation (e.g., not co-teaching plus PALS), (c) include a dependent variable that measured academic achievement, (d) involve an intervention that happened in secondary (grades 6 – 12) school, and (e) include students with a disability.

Coding Procedures

Studies that met the inclusion criteria were coded individually by four researchers. Each of the coders then met to compare coding, and in the event disagreements occurred, the researchers discussed the issue and arrived at a consensus, resulting in 100% agreement. The following variables were coded. First, participant characteristics were coded including the number of participants, grade, gender, race, and disability. Next, the type of article was coded as peer-reviewed journal, book chapter, dissertation or ‘other.’ The type of co-teaching used was coded as one of the six co-teaching approaches (Friend & Cook, 2013): (a) one teach, one observe; (b) one teach, one assist; (c) parallel teaching; (d) station teaching; (e) alternative teaching; and (f) team teaching. In the event it was not explicit, the coders met to determine the type of co-teaching, or listed it as ‘did not specify’. Next, the type of design was coded as randomized control trial, quasi experiment, single-case design, or causal comparative. The means, standard deviations, and study *n* were coded for treatment and control groups to allow for statistical analyses. In the event this information was not provided, statistical analyses were not conducted for a given study.

Finally, each study was rated using the CEC-EBP (CEC, 2014), which includes eight domains most of which include sub-domains. The domains cover: (1) context and setting, (2) participants, (3) intervention agent, (4) description of practice, (5) implementation fidelity, (6) internal validity, (7) outcome measures, and (8) data analysis. For a study to be considered methodologically sound under the CEC-EBP all domains and sub-domains must be met. It is typical for research syntheses to exclude those studies that do not meet criteria from further analyses. However, we have included each to account for publication bias, and because previous research (Losinski, Sanders, Katsiyannis, & Wiseman, 2017; Losinski, Wiseman, White, & Balluch, 2016) has shown that meeting all of the CEC-EBP domains is challenging, especially in the literature that predates the standards. For a study to meet each standard, the information in question had to be explicitly stated. For example, to meet the first indicator in domain 6, the study had to clearly explain how the researcher was in control of the introduction of the independent variable. Causal comparative studies were not assessed for bias or quality as no such standard requirements exist with which to assess them.

Data Analysis

The current meta-analysis analyzed study outcomes utilizing the standard mean difference (d), computed as the mean of the control group subtracted from the mean of the treatment group and divided by the pooled standard deviation: $d = \frac{\bar{x}^t - \bar{x}^c}{\text{Pooled } SD}$. According to Cohen (1988), $d \leq 0.20$ indicates an insignificant effect and $d \geq 0.80$ a large effect. Study effect sizes were entered into Comprehensive Meta-Analysis (CMA; version 2.2.064) where omnibus effect sizes were calculated by weighting studies by the inverse of the variance and a using random-effects model. Random effects, “assumes that the true effect size itself is regarded as a random variable taking on different values in different studies,” (Cooper, Hedges, & Valentine, 2009, p. 296). This method is especially useful when calculating varied effects across studies.

Publication bias. The likelihood of a treatment effect conveyed through a meta-analysis approximating the truth depends entirely on the validity of the studies included in the analysis (Maag & Losinski, 2015). Consequently, it is imperative to determine if the included studies are representative of the entire scope of studies thought to exist regarding co-teaching and its effect on the academic achievement of students with disabilities. Unfortunately, the research in the social sciences has come under scrutiny for being particularly prone to publication bias, in the form of a general lack of published studies with null results (Cook & Odom, 2013; Maag & Losinski, 2015). Thus, to account for publication bias in the current meta-analysis, the authors have included all publicly available studies in this review, not just those published in peer-reviewed outlets. Next, we applied two statistical tests to determine the extent to which the current findings may be subject to bias. It should be noted, however, that there is no agreed-upon method for accounting for publication bias, therefore we have chosen to present two methods: Duval and Tweedie’s trim and fill method (T&F; Duval & Tweedie, 2000), and Egger’s regression of the intercept test (ERI; Egger, Davey Smith, Schneider, & Minder, 1997). T&F makes use of a funnel plot of results to identify a hypothetical effect size. The funnel plot should be symmetrical if no bias exists. In the event the funnel is not symmetrical; effects are added to obtain symmetry in the funnel plot and the effect size is recalculated. ERI is a procedure that attempts to predict the effect size divided by its standard error. If bias is not present, the outcome would be zero, if bias is present integers exceeding zero would be noted.

Results

The initial search yielded 578 results. After screening the titles for duplicates, 463 articles remained. Four researchers screened the titles and abstracts, reaching a consensus on 56 articles. Those articles were then coded by two dyads of researchers, working together. Once coding was finished, the dyads met to compare results and discuss discrepancies until they agreed on 100% of the articles, leaving a total of 7 articles (see Figure 1). The research team then conducted a hand search of targeted journals and coded the articles in the same manner as before. One additional article was identified through an ancestral search of the reference lists of included articles and one other was identified in the hand search, resulting in a total of 9 articles included in the meta-analysis. In the event the researchers identified a study using a causal-comparative design during screening, the article was flagged and set aside for separate analysis.

Of the nine included articles, ten studies (Goldie, 2015 conducted two studies) were reported with a total of 3,532 participants. Descriptions of the participants, type of co-teaching, and

disabilities are found in Table 1. Six of the studies provided information for gender, with males being only slightly more prevalent ($n = 1,314$) than females ($n = 1,231$). Four of the nine studies specified race with White being the most commonly identified ($n = 2,022$), followed by Hispanic ($n = 204$), Black ($n = 171$), Asian ($n = 68$), Multiple races ($n = 165$), and Indian ($n = 8$). Four of the studies specified the type of co-teaching used with the most common being One-Teach, One Assist ($n = 2$), followed by Team Teaching ($n = 1$), and Co-Teaching with Content Enhancement Routines ($n = 1$).

Quality of Included Studies

None of the included studies met all of CEC's (2014) evidence based standards. The average quality percentage for the 9 included studies was 66%, with a range of 29% (Walsh, 1993) to 83% (McDuffie, 2009; Whisted, 2011). The most common omission among the studies were a lack of reporting of implementation fidelity (indicator 5.1, 5.2, & 5.3). In fact, only one of the included studies reported the use of an implementation checklist throughout the study to insure fidelity (Whisted, 2011). Table 2 provides results of study quality as assessed by the CEC-EBP (2014) indicators.

Synthesis of Study Outcomes

Table 3 displays results of the included studies utilizing the standard mean difference d to determine effectiveness. Three studies within two manuscripts had a moderate positive effect (Maultsby, 2009; Zgonc, 2007). Two studies included in the analysis showed moderate negative effects (Whisted, 2011; Goldie, 2015). Ultimately, results indicate that the overall effects of co-teaching were quite small ($d = -0.012$; 95% CI = -0.205 to 0.182).

With respect to the causal comparative studies, we chose to analyze their effects here to be as transparent as possible when discussing the relative effects of co-teaching, as these may be cited by others to attest to its effectiveness; however, no further coding was conducted. Results of this analysis is displayed in Table 4. We identified 11 articles that reported 13 outcomes across mathematics, reading, language arts, science and social studies. The omnibus effect size was $d = 0.260$ (var. = 0.017 ; 95% CI = 0.01 to 0.51) and ranged from a low of $d = -0.70$ (var. = 0.12 ; Mason, 2013) to a high of 0.74 (var. = 0.08 ; Owoh, 2013).

Publication Bias. To address publication bias, the following two analyses were conducted, Duval and Tweedie's trim and fill method (T&F; Duval & Tweedie, 2000), and Egger's regression of the intercept test (ERI; Egger, Davey Smith, Schneider, & Minder, 1997). Results of the T&F method showed the adjusted value to be $d = -0.25$ (95% CI = -0.46 to -0.04). With respect to ERI, the indicator resulted in an intercept of 1.68 ($se = 1.18$), which suggests that bias may be present. In all, both measures of publication bias suggest that some bias may be present.

Discussion

The current meta-analysis investigated the effects and evidence base of co-teaching interventions used to increase the academic achievement of students with disabilities. Overall, insignificant effects were observed, suggesting that co-teaching may not be an effective intervention when compared to controls for increasing academic achievement. Furthermore, no content area seemed to benefit more or less from the co-teaching strategy. In addition to few studies being

identified in our search, none of the studies met the quality standards set forth by CEC (2014) to determine an evidence-based practice, thus co-teaching to improve academic engagement in students with disabilities is far from attaining the standards established by CEC (insufficient evidence). Discussion of these findings with respect to the proposed research questions and implications of the current meta-analysis, in light of the results and what they mean to the inclusive movement, are presented. Finally, limitations and implications for future research are provided.

Co-Teaching versus Control Conditions

Our findings suggest co-teaching had little to no effect on increasing academic achievement across numerous content areas. Unlike the previous review conducted by Murawski and Swanson (2001), our analysis does not indicate co-teaching is an effective academic intervention. The calculated overall effect size ($d = -0.01$) falls well below the threshold of a moderate effect ($d > 0.20$; Cohen, 1988). Co-teaching had no effect on individual subject areas (math, reading, science, and social studies) with each overall effect size indicating little to no effect. For example, the largest effect size when examining individual subject areas was $d = 0.179$ for science, which still falls well below the standard set by Cohen (1988). Therefore, despite qualitative reviews that indicate teachers view co-teaching in a favorable light (Welch et al., 1999; Scruggs et al., 2007), there is little evidence to support co-teaching as means to improve academic achievement. Further, a larger number of retrospective causal comparative studies ($n = 11$) exist than experimental designs.

The importance of causal-comparative studies. Retrospective causal comparative, or ex post facto designs, (Busk, 2005) are not without their uses as they allow for the analysis of existing data through cohort designs. However, the ex post facto designs found in our search did not suggest that co-teaching is significantly better than controls ($d = 0.2$), and was only slightly better than the $d = 0.01$ found for the experiments. Neither the experiments nor the causal comparative designs pass beyond Cohen's (1988) standard of $d > 0.20$ as an insignificant effect. Further, we were not able to judge the quality of the studies against any indicators because none exist, however issues of quality and convention were present in the majority of them, and it is unlikely that if guidelines did exist that these studies would meet them.

Co-Teaching and the CEC (2014) Standards for Evidence-Based Practices

The CEC-EBP (2014) were applied to all studies in the analysis (excluding the causal comparative studies) to establish the evidence of each intervention. None of the studies included met all the CEC-EBP's (2014) for quality reporting. Frequent issues that arose in study quality included failure to describe implementation fidelity (89%) and a lack of adequate information concerning the disability status of participants (67%). Failure to describe implementation quality is particularly concerning, as this makes studies vulnerable to threats to validity. Additionally, if a study is difficult to implement with 100% fidelity or measuring the implementation fidelity with accuracy is problematic, it is difficult to draw accurate conclusions to determine the effectiveness of the intervention (i.e., issues of fidelity may be influencing the outcomes). Paucity of information concerning co-teaching implementation also leads to questions concerning the ability to bridge the research-to-practice gap.

It is also important to note that only one study included in this paper was conducted after the CEC-EBP standards were released, allowing for the possibility that some of the studies did not detail specific components that were actually included in the procedures, preventing it from being considered as contributing to the evidence base. Previous reviews have reported similar findings when applying CEC-EBP's standards to studies (e.g., Cook, Cook, & Cook, 2016; Houchins, Oakes, & Johnson, 2016; Losinski, Cuenca-Carlino, Zablocki, & Teagarden 2014; Losinski et al., 2016), highlighting the importance for future studies to be guided by these standards to create a high-quality research base. Furthermore, it is critical that all studies examining the effectiveness of co-teaching be published, even if they show negative results, so we can accurately determine the appropriateness of co-teaching as an academic intervention.

It is important to emphasize that the lack of explicit information about the co-teaching strategies used within the treatment group limits the conclusions we can draw. Because co-teaching is a practice inclusive of multiple strategies (e.g., small group instruction, collaborative learning activities) it is difficult to fully understand what types of interventions were taking place in the classroom. Additionally, it is unclear the type of instruction or curriculum used in the control settings. Furthermore, the majority of studies did not specify the types of students with disabilities included. With the term students with disabilities covering a broad spectrum of student characteristics and abilities, it is possible co-teaching may be more effective for certain disability categories. However, due to the paucity of information provided about specific disability categories, this remains unknown. Without detailed information on the types of instruction and participant characteristics in both the control and treatment groups, the conclusions that can be drawn are limited.

Co-Teaching and the Inclusive Movement

Advocacy efforts by organizations and researchers to more meaningfully include students with disabilities in the general education classroom (e.g., Stainback & Stainback, 1985) along with seeming confusion of key aspects of the No Child Left Behind Act of 2001 (now the Every Student Succeeds Act of 2015) and the Individuals with Disabilities Education Improvement Act of 2004 have seen a dramatic increase in levels of inclusion of students with disabilities in the general education classroom (Mastropieri & Scruggs, 2014). However, as noted by subsequent court cases on the topic, courts commonly rule in favor of a continuum of placements over full inclusion (Yell, 1995; Yell & Katsiyannis, 2004; Zirkel, 1996). Further, the courts direct that these decisions should be prepared on an individual basis, and determined by the benefits of the respective setting. What's more, research has illustrated the complexities of inclusive practices in general, and a divide among the views of the classroom teacher and school administrator (Cook, Semmelb, & Gerber, 1999).

Co-teaching and differentiated instruction, swept in under the inclusive reform movement, are both viewed as a means for providing for the full inclusion of all students through a re-working of the general education pedagogical model (Mastropieri & Scruggs, 2014). Co-teaching has enjoyed extensive attention in the educational literature through anecdotal experiences and suggestions for implementation (Cook et al., 2017; Mastropieri, Scruggs, & McDuffie, 2007). However, empirical research on the efficacy of co-teaching on the achievement of students with disabilities is sparse at best (Murawski & Swanson, 2001). Our findings show a similar result,

with co-teaching showing no benefit compared to control conditions in the few studies that have researched it.

Our findings would seem to support inclusive practices in the general education classroom, which advocates for students to be placed in the general education classroom for a variety of reasons (e.g., socialization, content access; Fuchs & Fuchs, 1998; Fuchs et al., 2015). Specifically, there were no differences in the outcomes of students receiving their education in a co-teaching model versus the control. Thus, if academic outcomes are not affected, then co-teaching appears to be a useful way to provide for a holistic educational experience for students with disabilities, as it allows teachers to provide specially designed instruction for students alongside their peers who are typically developing. This is consistent with the least restrictive environment mandate of the IDEA (2004) which requires that students with disabilities be educated with non-disabled peers to the maximum extent possible (34 CFR § 300.114). Further, by receiving instruction in the general education setting, students are more likely to be exposed to unmodified grade level standards, which is essential for special education students seeking a traditional diploma.

What is not clear in the current meta-analysis is what methods were utilized in the control conditions, and whether resource rooms utilizing state-of-the-art special education instruction would outperform the co-teaching model. For example, Fuchs et al. (2015) found that state-of-the-art special education instruction in a small group setting outperformed the inclusive environment. Once again, however, it is not clear what the control condition was. Thus, the answer to the question of inclusion versus resource room cannot be definitively answered by current research. What is needed is a strong set of studies that clearly describe the control conditions and put well developed and state-of-the-art co-teaching versus state-of-the-art instruction in the resource classroom. Only through such an examination by an unbiased research team will this question be solved.

Limitations and Future Research

The current meta-analysis is not without its limitations. First, there are a variety of ways to discuss co-teaching (e.g., teaming); however, our analysis only searched for the words co-teaching. It is plausible that having entered in additional words may have provided a larger pool from which to choose from, though the ancestral and hand searches conducted would likely have caught any studies that may have been missed. Additionally, our search found studies not included in some of the other recent reviews (e.g., Cook et al., 2017). A second limitation was with the hand search, where we did not search other journals that may have had other studies published in them (e.g., the *Journal of Learning Disabilities*). However, our choosing of the top journals in the field and also those that had shown up in earlier works seems sufficient in finding studies through the hand search. Third, the addition of grey literature, all publicly available studies including dissertations, may have affected the results, although upon examination the dissertations were not meaningfully different from peer-reviewed studies in either quality or effects. Finally, this literature is fraught with an inability in the experiments to have a control condition that represents a true control for co-teaching. For example, what is being learned in the resource room maybe vastly different, and probably is, than what is being learned in the general education classroom. Therefore, it's hard to distinguish if co-teaching were being

investigated, or simply being in a room with different access to the general education curriculum were. In other words, are we comparing a Fuji apple to a pink lady apple, or are we comparing a Fuji apple to a watermelon?

Future researchers should engage in high-quality investigations of the co-teaching model so that we can have a better idea of the relative effects of co-teaching. Additionally, researchers should undertake investigations to determine which models of co-teaching perform better than others with regard to the achievement of students. Third, it would be important for future researchers to work with a control that was allowing the same access to the curriculum as the treatment group, perhaps investigating having students in the control group also be in the general education curriculum, but with different supports (e.g., paraprofessional support; differentiated instruction). Finally, future research should undertake a large-scale investigation of the inclusion of grey literature (non-peer-reviewed) and if it truly is inferior to its peer-reviewed counterpart.

Conclusion

Co-teaching makes intrinsic sense: two teachers in the classroom, one with content knowledge, one with pedagogy knowledge, should result in marked improvement of students. However, this has not been shown to be the case in the literature. The lack of quality of the studies, along with the null effects, would suggest that practitioners should not use co-teaching until other higher-quality investigations have been conducted. However, looking at the issue from another direction, a null effect in this case possibly suggests something different: students being served in a co-teaching environment are performing as well as those in resource rooms. This would imply that there is no legitimate reason to separate children from their peers and the general education curriculum if co-teaching can serve them with the same results.

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Note: References with a * are those included in the literature review.

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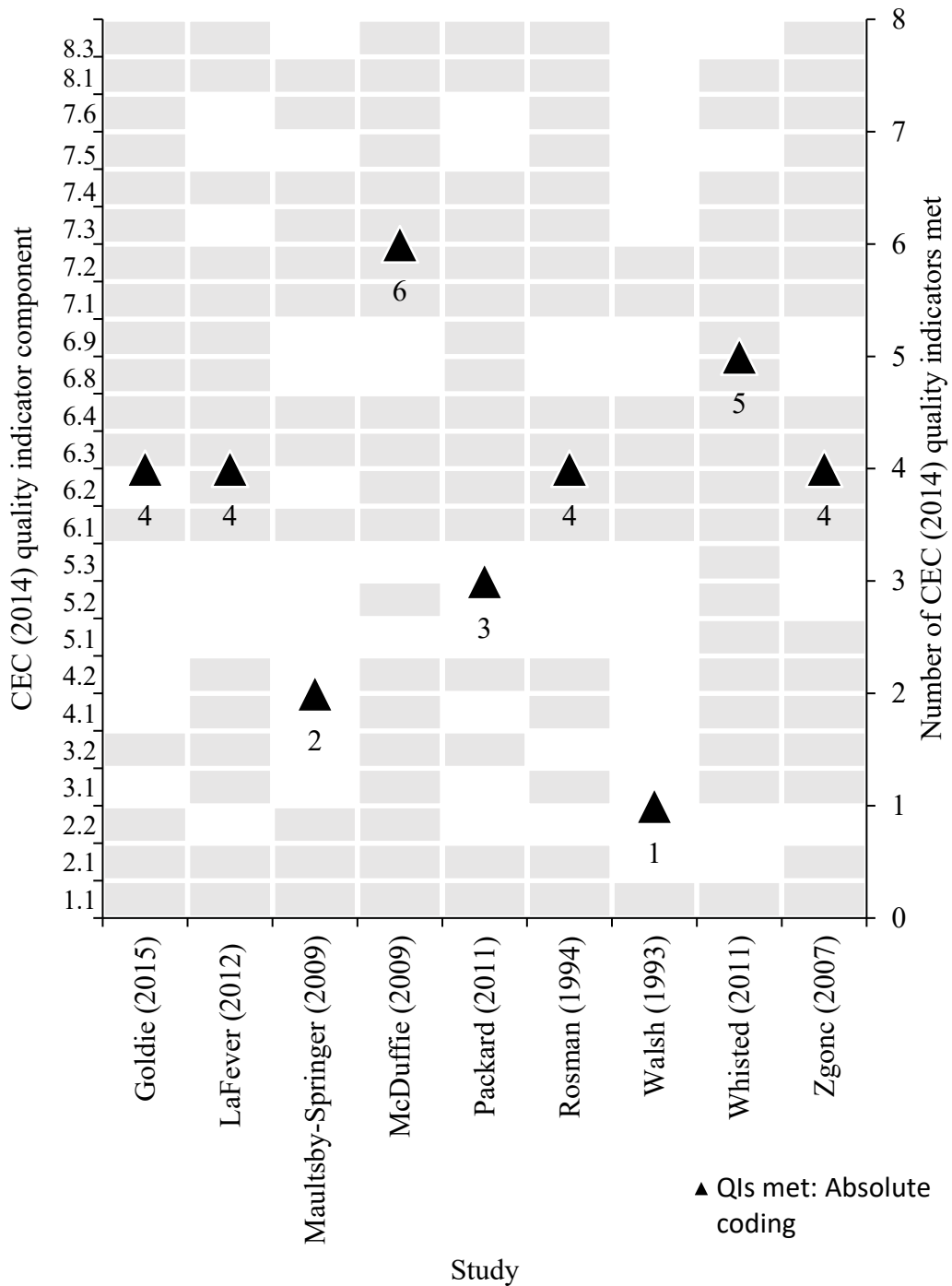
Study	N	Grade (<i>n</i>)	Gender (<i>n</i>)	Race (<i>n</i>)	Type of Co-Teaching	Disability	Results
Goldie (2015) (Math)	642	11	333(M), , 306 (F)	W(533), B(26), H(45), 6 (A), 27 (MR)	DNS	DNS	Students in non-co-taught classes performed better than students in co-taught classes.
Goldie (2015) (ELA)	1305	11	689(M), , 623 (F)	W(1150), B(29), H(53), 15 (A), 59 (MR), 6 (I)	DNS	DNS	Students in non-co-taught classes performed better than students in co-taught classes.
LaFever (2012)	174	9	DNS	DNS	One-Teach, One-Assist & Pull-Out	DNS	Effective if one special education teacher and one subject certified teacher are present
Maultsby (2009)	102	5-8	DNS	DNS	DNS	DNS	Increase of achievement in math with students with disabilities; decrease in reading in students without disabilities
McDuffie (2009)	194	7	106 (M), 97 (F)	137 (W), 19 (B), 22(H), 18 (A), MR (7)	Team Teach, One-Teach, One Assist, Alternative, & Station	LD, ED, OHI, Autism, SL	Students in co-teach classroom performed better than students in traditional setting
Packard (2011)	14	9	9 (M), 5 (F)	W(10), B(4)	DNS	LD	Students with LD achieved better in resource room than co-taught room
Rosman (1994)	59	9	25(M), 34(F)	DNS	Team Teaching	DNS	Students in co-teaching scored significantly higher; no significance in scores of students with IEPs
Walsh (1993)	706	9	DNS	DNS	DNS	DNS	All students benefited from the co-taught classroom
Whisted (2011)	18	9	DNS	DNS	DNS	DNS	No overall significant difference between co-taught and traditional classrooms

Zgonc (2007)	318	9-10	152(M) , 166(F)	W(192), B(93), H(84), A(8), I(2), MR(9)	Co-Teaching with Content Enhancement Routines	DNS	No significant difference between co-taught and non co-taught classes
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Table 1. Study Characteristics

Note. DNS = Did not specify; OHI = Other Health Impairment; SLD = Specific Learning Disability; ID – Intellectual Disability; ASD = Autism Spectrum Disorder; HI = Hearing Impaired; W = White; B = Black; A = Asian; H = Hispanic; I = Indian; MR = Multi-Racial

Table 2: Quality Indicators



Note: Left y axis displays the components of CEC (2014) quality indicators (QI). Shaded cells indicate the component was met; white cells denote the component was not met. The right x axis shows the number of absolute QI. Triangles represent the absolute coding of each study.
 Lane, K. L., Common, E. A., Royer, D. J., & Muller, K. (2014)

Table 3: Effect Sizes

Study	Std diff in means	SE	var	Lower Limit	Upper Limit	Z	p	Std. diff in means and 95% CI
Math								
Goldie (2015)	-0.194	0.090	0.008	-0.370	-0.018	-2.156	0.031	
Maultsby (2009)	0.275	0.145	0.21	-0.009	0.559	1.897	0.058	
Whisted (2011)	-0.471	0.248	0.062	-0.957	0.015	-1.899	0.058	
Total	-0.104	0.210	0.044	-0.515	0.308	-0.494	0.621	
Reading								
Goldie (2015)	-0.336	0.076	0.006	-0.486	-0.186	-4.398	0.000	
Maultsby (2009)	0.303	0.145	0.021	0.019	0.587	2.088	0.037	
Packard (2011)	0.167	0.472	0.223	-0.758	1.092	0.354	0.723	
Total	-0.006	0.224	0.050	-0.445	0.433	-0.027	0.979	
Science								
McDuffie (2009)	0.179	0.144	0.021	-0.103	0.461	1.243	0.214	
Total	0.179	0.355	0.126	-0.517	0.875	0.504	0.614	
Social Studies								
Zgonc (2007)								
Group A	-0.072	0.155	0.024	-0.376	0.232	-0.465	0.642	
Group B	0.277	0.327	0.107	-0.364	0.918	0.847	0.397	
Group C	-0.006	0.463	0.214	-0.913	0.901	-0.013	0.990	
Total	0.047	0.253	0.064	-0.450	0.544	0.185	0.853	
Overall	-0.012	0.099	0.010	-0.205	0.182	-0.117	0.907	

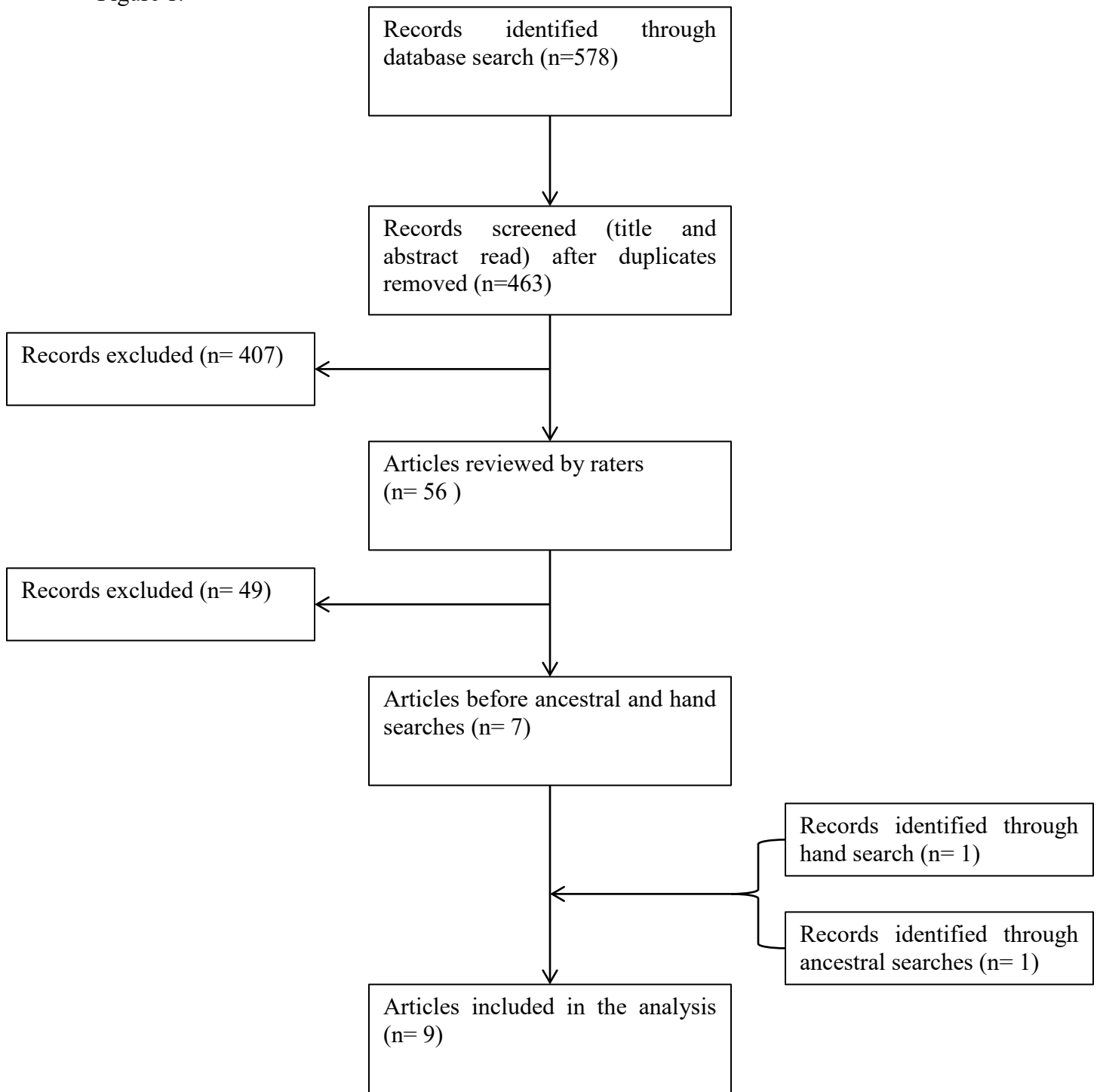
Note: SE=Standard Error; var = variance; Z = Z-score; p = p-score; CI = confidence interval

Table 4: Effect Sizes of Causal Comparative Studies

Study	Std diff in means	SE	var	Lower Limit	Upper Limit	Z	p	Std. diff in means and 95% CI	
Math									
Emery (2009)	0.607	0.168	0.028	0.278	0.936	3.616	0.000		
Fontana (2005) 7 th	-0.083	0.348	0.121	-0.766	0.600	-0.239	0.811		
Fontana (2005) 8 th	0.277	0.350	0.122	-0.409	0.963	0.793	0.428		
Mason (2013)	-0.695	0.178	0.032	-1.044	-0.346	-3.907	0.000		
Total	0.019	0.292	0.085	-0.554	0.592	0.066	0.948		
Reading									
Andrews-Tobo (2009)	0.546	0.335	0.112	-0.110	1.202	1.630	0.103		
Emery (2009)	0.397	0.160	0.026	0.082	0.711	2.475	0.013		
Ervin (2010)	-0.309	0.301	0.091	-0.900	0.281	-1.027	0.304		
Mote (2010)	1.466	0.331	0.110	0.817	2.116	4.425	0.000		
Owoh (2013)	0.742	0.287	0.082	0.180	1.304	2.587	0.010		
Total	0.553	0.266	0.071	0.032	1.074	2.082	0.037		
English									
Fontana (2005) 7 th	-0.130	0.349	0.122	-0.814	0.553	-0.374	0.708		
Fontana (2005) 8 th	0.636	0.357	0.127	-0.063	1.336	1.782	0.075		
Williams (2012)	0.706	0.432	0.187	-0.141	1.554	1.634	0.102		
Total	0.385	0.344	0.118	-0.289	1.060	1.119	0.263		
Science									
Garrett-Rainey (2014)	-0.098	0.061	0.004	-0.218	0.022	-1.599	0.110		
Total	-0.098	0.465	0.216	-1.009	0.813	-0.211	0.833		
Social Studies									
Chilcoat (2011)	0.177	0.269	0.072	-0.350	0.704	0.659	0.510		
Muscelli (2011)	0.167	0.181	0.033	-0.188	0.522	0.923	0.356		
Total	0.172	0.363	0.132	-0.539	0.883	0.473	0.636		
Overall	0.255	0.184	0.034	-0.107	0.616	1.379	0.168		

Note: SE=Standard Error; var = variance; Z = Z-score; p = p-score; CI = confidence interval

Figure 1.



Evaluation of the Rhythmic Arts Project, a Multi-Modal Rhythm-Based Perception and Action Intervention, in a School-Based Setting in Children with Autism Spectrum Disorders

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Abstract

The Rhythmic Arts Project (TRAP) curriculum integrates visual, tactile, auditory and speech experiences through rhythmic drumming actions to address life skills. We evaluated life skills before and after participation in TRAP in a school-based setting in children with Autism Spectrum Disorders (ASD). Participants were 23 children in grades 6-12 in a special education program for students with ASD. We administered the Pediatric Evaluation of Disability Index Computer Adaptive Test (PEDI-CAT) before and after they participated TRAP. Children showed significant increases in participation in daily activities, mobility status, cognitive and social skills, and responsibility after participation in TRAP. We did not have a comparison or control group, however we used a repeated baseline design to support that changes were generally not observed over the summer when children were not participating in TRAP. Our results represent a first step in evaluating the effectiveness of TRAP by systematically measuring changes in life skills.

Keywords: The Rhythmic Arts Project; education; curriculum; Autism Spectrum Disorders; perception-action; intervention

Evaluation of the Rhythmic Arts Project, A Multi-Modal Rhythm-Based Perception and Action Intervention, in a School-Based Setting in Children with Autism Spectrum Disorders

The Rhythmic Arts Project (TRAP) educates individuals with intellectual and developmental disabilities by embracing a curriculum that encompasses rhythm as a modality to address basic life and learning skills, reading, writing and arithmetic. TRAP is a non-profit company with a mission to empower people with various disabilities to succeed in the world by integrating drums and percussion instruments as creative learning tools that address life skills and enhance the

mind, body and spirit. The TRAP methodology is based in a multi-modal rhythm-based perception and action approach. The approach combines visual, tactile, auditory and speech experiences through rhythmic drumming actions. The idea is to see, feel and hear the lessons and simultaneously speak the answers (“The Rhythmic Arts Project Website,” n.d.). Although TRAP can be used for a broad population of individuals with intellectual and developmental disabilities, in this report we focused specifically on children with Autism Spectrum Disorders (ASD).

TRAP principles fit especially well with three evidence-based treatment principles for ASD: modeling, prompting, and visual supports (“California Autism Professional Training and Information Network Website,” n.d.; “National Professional Development Center on Autism Spectrum Disorder Website,” n.d.). For example, in TRAP these principles are addressed in the following way: Modeling: when the teacher provides demonstration of a desired behavior that results in skill acquisition through learner imitation (e.g., teacher will demonstrate spelling her name on the drum to the group of students). Prompting: verbal, gestural, or physical assistance that supports skill acquisition (e.g., teacher will use verbal encouragement to support the child using his or her hand to hit the drum). Visual Supports: visual display that supports independent skill use (e.g., teacher will hold up a picture of a drum with a hand on it to show the activity before the student is asked to hit the drum). Because TRAP methodology aligns with evidence-based treatment principles for ASD, we wanted to systematically evaluate its potential effectiveness as a school-based intervention to improve participation in children with ASD.

We used the Pediatric Evaluation of Disability Index Computer Adaptive Test (PEDI-CAT) for TRAP program evaluation. The PEDI-CAT is a standardized norm-referenced assessment applicable to children ages 3-20 years with physical and/or behavioral disability conditions (“PEDI-CAT website,” n.d.). The PEDI-CAT measured the child’s participation in 4 areas: daily activities, mobility status, cognitive and social skills, and responsibility. In this project we analyzed scaled scores. Scaled scores provide a way to measure a child’s current functional skills and progress in these skills over time. Scaled scores are especially helpful in documenting improvements in functional skills for children not expected to exhibit or regain normative levels of functioning (“PEDI-CAT scoring website,” n.d.).

The purpose of this investigation was to measure participation in four areas of function (daily activities, mobility status, cognitive and social skills, responsibility) before and after a year of TRAP intervention in middle and high school students with ASD. We used a repeated measures baseline approach to measure typical rate of change in the 4 areas of function before we introduced the TRAP intervention.

Methods

This research study was approved by the Ventura County Medical Center Institutional Review Board and conducted in accordance with the Declaration of Helsinki as revised in 2000. A parent or legal guardian signed a consent form prior to their child’s participation. All students participated in TRAP as per their standard curriculum, however students for whom we had consent were additionally evaluated with the PEDI-CAT before and after participation in TRAP. TRAP intervention and the PEDI-CAT were completed by one teacher with 13 years of experience teaching this population and with 6 years of experience teaching TRAP.

Participants were 23 children (21 male, 2 female) in grades 6-12 in a special education program for students with ASD at Triton Academy in Ventura County, CA. Their teacher completed the PEDI-CAT at the beginning of June, at the end of one school year (Pre-TRAP 1). The PED-CAT was completed again approximately 3 months later, at the start of the next school year (Pre-TRAP 2). This repeated baseline design provided a measure of typical rate of change in the 4 areas of function evaluated by the PEDI-CAT before we introduced the TRAP intervention. Following the baseline PEDI-CAT assessments, students participated in 2 sessions of TRAP per week across the school year, from September through June. TRAP curriculum was followed ("The Rhythmic Arts Project Website," n.d.). The class progressed through the curriculum, from beginning to end, across the course of the school year. A summary of the number of sessions they participated in is shown in Table 1. A post-TRAP PEDI-CAT was completed in June (Post-TRAP), approximately 9 months after the baseline assessments were completed.

Participation in TRAP was evaluated by documenting each students' level of engagement and amount of help needed each week. Level of engagement was rated as low/engaged less than 25% of lesson (1), moderate/engaged 26-75% of the lesson (2), or high/engaged more than 75% of lesson (3) Amount of help needed was rated as none (0), low/less than 25% of time (1), moderate/26-75% of the time (2), or high/more than 75% of time (3).

Descriptive statistics were used to summarize data. The Kolmogorov-Smirnov test was used to assess data for normality. As data were not normally distributed, non-parametric statistics were used (Related-Samples Friedman's Two-Way Analysis of Variance) to test for significant changes in PEDI-CAT scores before and after TRAP. Paired t-tests were used to test for post-hoc differences. We used SPSS software (version 22, IBM Corporation, Armonk, NY) and an alpha level of 0.05 for all analyses.

Results

Participation

In general, participation was high for most children. Out of 76 possible sessions, most children participated in 70 or more sessions (see Table 1). Level of engagement tended to be moderate to high, while amount of help needed was variable (see Table 1).

PEDI Scaled Scores

Related-Samples Friedman's Two-Way Analysis of Variance were used to test for significant changes in PEDI-CAT scores across the 3 TRAP assessments (Pre-TRAP 1, Pre-TRAP 2, Post-TRAP). There were significant differences found for all four areas: daily activities, mobility status, cognitive and social skills, and responsibility ($p < 0.01$ for all).

Paired t-tests were used to test for post-hoc differences between each possible pair of 3 TRAP assessments (Pre-TRAP 1, Pre-TRAP 2, Post-TRAP) in each area: daily activities, mobility status, cognitive and social skills, and responsibility. There were significant increases found for all four areas between Pre-TRAP 1 and Post-TRAP and Pre-TRAP 2 and Post-TRAP. In addition, daily activities significantly decreased between Pre-TRAP 1 and Pre-TRAP 2 and cognitive and social skills significantly increased between Pre-TRAP 1 and Pre-TRAP 2. Group

results are shown in Table 2, with significantly different p-values identified in bold font. Individual results are shown in Figures 1-4.

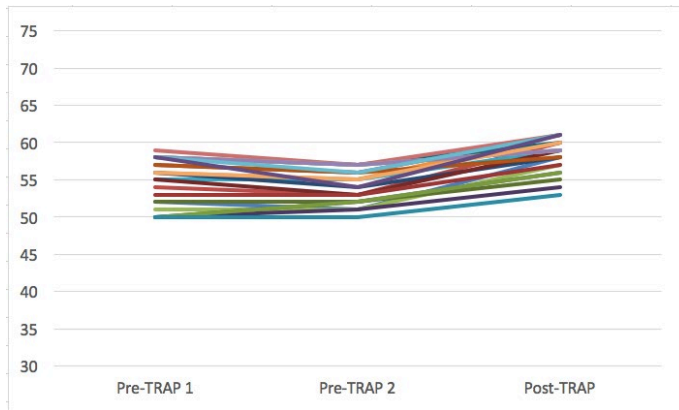


Figure 1. Pediatric Evaluation of Disability Index Computer Adaptive Test Scaled Daily Activity Scores. Each child is shown as a separate line across the 3 assessment time points: end of one school year (Pre-TRAP 1), approximately 3 months later, at the start of the next school year (Pre-TRAP 2), and approximately 9 months later after TRAP intervention (Post-TRAP). TRAP =The Rhythmic Arts Project.

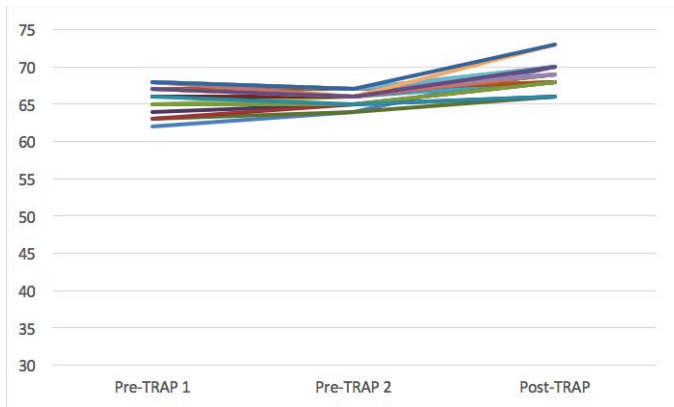


Figure 2. Pediatric Evaluation of Disability Index Computer Adaptive Test Scaled Mobility Status Scores. Each child is shown as a separate line across the 3 assessment time points: end of one school year (Pre-TRAP 1), approximately 3 months later, at the start of the next school year (Pre-TRAP 2), and approximately 9 months later after TRAP intervention (Post-TRAP). TRAP =The Rhythmic Arts Project.

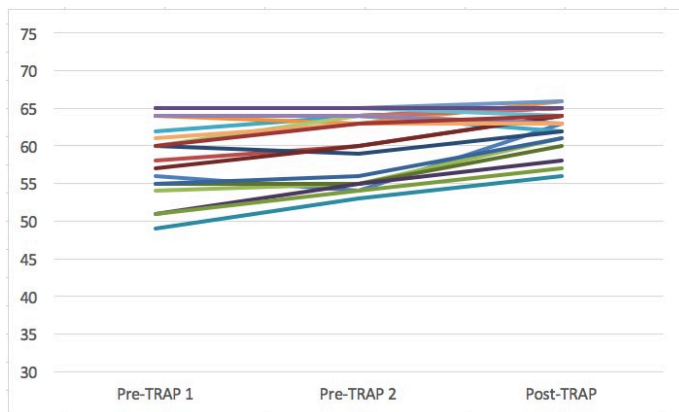


Figure 3. Pediatric Evaluation of Disability Index Computer Adaptive Test Scaled Cognitive and Social Skills Scores. Each child is shown as a separate line across the 3 assessment time points: end of one school year (Pre-TRAP 1), approximately 3 months later, at the start of the next school year (Pre-TRAP 2), and approximately 9 months later after TRAP intervention (Post-TRAP). TRAP =The Rhythmic Arts Project.

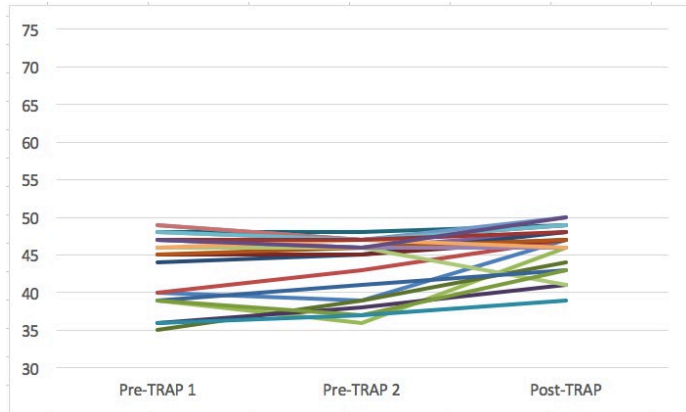


Figure 4. Pediatric Evaluation of Disability Index Computer Adaptive Test Scaled Responsibility Scores. Each child is shown as a separate line across the 3 assessment time points: end of one school year (Pre-TRAP 1), approximately 3 months later, at the start of the next school year (Pre-TRAP 2), and approximately 9 months later after TRAP intervention (Post-TRAP). TRAP =The Rhythmic Arts Project.

Discussion

Children participated in TRAP as a part of their standard curriculum for one school year in a special education program (grades 6-12) for students with ASD. They showed significant increases in their participation in daily activities, mobility status, cognitive and social skills, and responsibility after participation in TRAP. Our results support that TRAP may support gains in daily activities, mobility status, cognitive and social skills, and responsibility, however further, controlled research with a comparison group is needed. The results are reasonable, though, as TRAP goals include: self-awareness, attending skills, socialization, turn taking, verbalization, memory, differentiating between options (colors, sounds, etc.), sequencing, patterning, temporal organization, motor control, motor rhythm, and laterality. Further, TRAP principles fit especially well with three evidence-based treatment principles for ASD: modeling, prompting, and visual supports (“California Autism Professional Training and Information Network Website,” n.d.; “National Professional Development Center on Autism Spectrum Disorder Website,” n.d.).

Using modeling, prompting, and visual supports in TRAP could be achieved as described in the following two examples. For the first example, a child was asked to drum right (R), left (L), R, L and responded that she could not distinguish R from L. The teacher modeled the task and reinforced it with visual aids by displaying four quarter notes, labeled R L R L, one on each of four drums (see Figure 5). She prompted the child “Now it’s your turn!”. The child then successfully accomplished the task by simultaneously hitting the drum and saying, “right, left, right, left”. She then received applause from the rest of the class.



Figure 5. Example of visual aids used to display four quarter notes, each worth one beat, labeled right (R), left (L), R, L. One note would be placed on each of four drums.

For the second example, a child was asked to identify the numbers placed on the drum by drumming highest (3), lowest (1), then middle (2). He hesitated. The teacher then pointed at the number cards (visual cues) and tapped on the drum indicating 3 and saying “highest” (modeling). She encouraged him verbally saying “Now it’s your turn, drum highest, lowest, middle!” (prompting). He was then able to successfully complete the task, and his classmates cheered.

This is one of the first examples of a systematic evaluation of a school-based intervention. As a recent review article (Kasari & Smith, 2013) describes, “Although researchers have identified many promising teaching strategies and intervention programs for children with ASD spectrum disorder, research on implementation of these interventions in school settings has lagged. Barriers to implementation include incompletely developed interventions, limited evidence of their utility in promoting long-term and meaningful change, and poor fit with school environments. To overcome these barriers, interventions need to be detailed in manuals that identify key components yet allow for flexibility, and studies need to evaluate long-term, real-life outcomes. Innovative research strategies also may be important, particularly carrying out research on new interventions in school settings from the outset, conducting partial effectiveness trials in which study personnel administer interventions in school settings, using community-partnered participatory research approaches, and redesigning interventions in a modular format.” Our study addresses these recommendations: the TRAP intervention is detailed in a manual that identifies key components yet allows for flexibility, our study evaluates long-term, real-life outcomes, and study personnel administered the intervention in a school setting using community-partnered participatory research approaches.

The TRAP multi-modal rhythm-based perception and action approach combining visual, tactile, auditory and speech experiences also fits with recent advances in understanding about the links between motor and other areas of the brain. The basal ganglia, which are typically associated with motor control (reward-based learning, sequencing, etc.), are also associated with human reasoning, adaptive function/behavior, and sensorimotor integration abnormalities (for review see (Leisman, Braun-Benjamin, & Melillo, 2014; Patel, Jankovic, & Hallett, 2014)). Their involvement has been described in many conditions, including attention deficit/hyperactivity disorder (Leisman et al., 2014), Parkinson’s disease, dystonia, and Tourette’s syndrome (Patel et al., 2014). In fact, a recent perspective article (Gordon, Jacobs, Schuele, & McAuley, 2015) describes, “Evidence for a role of rhythm skills in language development and language ... (a) behavioral and brain data from adults and children, showing that prosody and other aspects of

timing of sentences influence online morpho-syntactic processing; (b) co-morbidity of impaired rhythm with grammatical deficits in children with language impairment; and (c) our recent work showing a strong positive association between rhythm perception skills and expressive grammatical skills in young school-age children with typical development.” In regard to ASD, recent work (Tryfon et al., 2017) demonstrates that non-verbal rhythm synchronization is intact over the course of childhood development in children with ASD. Taken together, these results support the approach of TRAP to use rhythmic motor tasks combined as the basis for providing intervention. In future research, we would like to systematically explore specific underlying mechanisms of potential benefits from the TRAP program. In addition, we would like to expand to other populations of interest, for example persons with Down syndrome.

This study has several limitations. 1) We did not have a comparison program or no-TRAP control group, however we did employ a repeated baseline design to support that changes were generally not observed over the summer when children were not participating in TRAP. In fact, their daily activity scores decreased over this time period. It should be noted, however, that they were not in school across this time period, so any effect of school itself cannot be isolated from any effects of TRAP. Another area of future research could be exploring ways of expanding the program to allow for additional opportunities for practicing at home. 2) The program was assessed in a single setting with a single teacher, limiting generalizability. 3) The assessor of the PEDI-CAT was not blinded and therefore bias is possible. Blinding of the assessor was not feasible in this setting, and using a single assessor allowed us to avoid inter-rater reliability problems.

Conclusions

Children participated in TRAP as a part of their standard curriculum for one school year in a special education program (grades 6-12) for students with ASD, demonstrating that TRAP was integrated into the overall curriculum and schedule. We systematically evaluated participation in daily activities, mobility status, cognitive and social skills, and responsibility using the PEDI-CAT, an appropriate and valid measure. Our results suggest that TRAP may support gains in daily activities, mobility status, cognitive and social skills, and responsibility when provided as part of a special education curriculum.

Acknowledgements

Thank you to the students, their families, and Ventura County Office of Education Special Education Department for their support of the project, specifically Dwire and Triton schools. Thank you to Joseph Papador and Garen Garza for assistance with data collection and management. Dr. Smith’s salary was supported in part by K12-HD055929 (PI: Ottenbacher). Study data were collected and managed using REDCap electronic data capture tools hosted at Ventura County Medical Center (<https://www.project-redcap.org/>). The funding source had no role in the study design; the collection, analysis or interpretation of data; the writing of the report; or the decision to submit the article for publication.

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About the Authors

Beth A. Smith, PT, PhD, received her physical therapy degree from Boston University and worked as a clinician at University of Michigan Hospital before returning to school to pursue a PhD in the Developmental Neuromotor Control Laboratory in the School of Kinesiology at the University of Michigan, followed by a postdoctoral fellowship in the Balance Disorders Laboratory in the Department of Neurology at Oregon Health & Science University. Beth is currently Assistant Professor of Research in the Division of Biokinesiology and Physical Therapy at the University of Southern California, where she is the director of the Infant Neuromotor Control Laboratory.

Eddie Tuduri is the founder and director of The Rhythmic Arts Project. In 1990, The U.S. Committee for Unicef named Eddie volunteer of the year. In 1998, Eddie was voted Local Hero by the Santa Barbara Independent and presented with The Volunteer of the Year award by The Rehabilitation Institute at Santa Barbara. In April 2002 Eddie received the Citation Award for Therapeutic Recreation. In 2005, The Michael Landon Award was presented to Eddie by the California Governor's Committee, for accurately portraying people with disabilities in the media.

In 2009, Eddie received the Citizens for Peaceful Resolutions Earth Charter Award for his commitment to youth education and outreach. In 2010, Eddie won the Muriel Anderson Music For Life Alliance Award for supporting music education and providing instruments for children who may not otherwise enjoy the experience of making music. He received the Richard Lee Adelman Service Award in 2013, for outstanding contributions to the lives of individuals with disabilities. In 2013, he also received the Global Citizen Award from The Academia Cotopaxi Global Citizen award. This honor is bestowed on an individual who has made a significant contribution to the betterment of humanity in Ecuador and the world.

Emily Mostovoy has over 15 years of experience in education. She has held positions as school counselor, principal and Special Education Director. She has over 10 years of experience as a school administrator, the last 6 years as Special Education Director. She is an active member of Special Education Administrators of County Office (Past Chair 2017-2018). Her current title is Executive Director of Special Education, and she has been with the Ventura County Office of Education for the last 5 years. She was instrumental in bringing The Rhythmic Arts Project to Ventura County Office of Education.

Denise Pannell, M.S. has worked for the Ventura County Office of Education (VCOE) for the past 12 years. In 2007, she was one of the first teachers to help open Triton Academy which is a highly specialized school to serve students with Autism Spectrum Disorder (ASD). Denise continues to work as an education specialist and lead teacher at Triton and she has participated in collaborations such as Triton Advisory and Triton Academy Parent Association. Denise has been integral to the growth and opportunities provided to students at Triton. Her dedication and commitment to the program has allowed students to successfully transition to post-secondary opportunities but more so has guided support staff to become specialists in the education field. Denise works closely on committees such as the Transition Network Team (TNT) and with the Workability Coordinator through the Ventura County SELPA. Denise is also an Autism specialist and helps provide trainings within VCOE and county wide to teachers and families wanting to know more about services for students with ASD. Denise works collaboratively with specialists such as behaviorists, speech and language pathologists, occupational therapists, and with clinicians from Ventura County behavioral health to provide meaningful educational benefit and help give students the skillset needed to be successful when leaving her program.

Chris Landon, MD, FAAP, FCCP, CMD, is Director of Pediatrics at Ventura County Medical Center, Clinical Associate Professor of Pediatrics at Keck USC School of Medicine, and Clinical Assistant Professor of Family Medicine at UCLA School of Medicine. Dr. Landon developed the multi-disciplinary Pediatric Diagnostic Center serving children with special health care needs and their families, Landon Pediatric Foundation to support this work locally and globally, and is President of The Rhythmic Arts Project non-profit.

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