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School Outcomes of Students with and At Risk for Disabilities in Poverty: An Evaluation of School-Based Interventions in the U.S.

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Abstract

Poverty as a cultural factor affects students' school success and outcomes. In the current literature review, we aimed at providing a comprehensive analysis of intervention research designed to support school outcomes of students aged 3 to 21 years with disabilities or at risk for developing disabilities in high-poverty contexts. Eighteen studies were included in this review (16 group designs, 1 single case design, and 1 group design with embedded single case), with a total of 1782 student participants. Results indicated that most of the research studies designed for students in poverty focused on their language skills (e.g., reading, vocabulary, literacy) with various interventions. Most of the group design studies met the quality indicators (Gersten et al., 2009) with a low standard, although all single case studies met the quality indicators by higher than 80% (Kratochwill et al., 2013). As for the analysis of cultural responsiveness, we found that most studies provided limited information reflecting culturally responsive research (Trainor & Bal, 2014). Discussion and implication for practice and research are provided.

Key Words: poverty, school-based interventions, school outcomes, disabilities, at risk

Approximately 0.75 million children with disabilities ages 3 through 5 (746,765) and 5.94 million students with disabilities ages 6 through 21 (5,936,518) were served under the Individuals with Disabilities Education Improvement Act (IDEA 2004) during the 2015-2016 school year in the U.S. and their prevalence is 6.2% and 8.9%, respectively (U.S. Department of Education, 2017). Students with disabilities usually have lower academic achievement and/or problematic classroom behaviors as part of the IDEA criteria that interfere with their school performance (Nelson et al., 2004; Walker et al., 1995; Walker & Severson, 2002). According to the National

Assessment of Educational Progress (NAEP, 2017), students with disabilities reached a lower reading proficiency compared to their peers without disabilities (4th graders: 12.0% vs. 40.0%; 8th graders: 10.0% vs. 40.0%; 12th graders: 10.0% vs. 33.0%, respectively). Similar to reading performance, students with disabilities also performed poorer in math than their peers without disabilities (4th graders: 16.0% vs. 44.0%; 8th graders: 9.0% vs. 38.0%; 12th graders: 5.0% vs. 23.0%, respectively). Both the NAEP reading and math scale scores ranged from 0 to 500. As such, the data suggested that students with disabilities continue to lag dramatically behind their non-disabled peers in academics.

Underachievement at schools place students with disabilities at higher risks for school failure (e.g., poor academic performance; Lane & Menzies, 2002). They may also experience social, behavioral, and emotional challenges. For instance, according to the National Center for Educational Statistics (NCES, 2017), in the 2015-2016 school year, high school students with disabilities had a lower 4-year adjusted cohort graduation rate compared to students without disabilities (66.0% vs. 84.0%). According to the U.S. Department of Education (2018), Civil Rights Data Collection (CRDC) shows that, in the 2015-2016 school year, students with disabilities, who comprised 12% of all students enrolled, are more than twice as likely to be physically restrained and nearly twice as likely to be secluded as students without disabilities.

Poor school outcomes of individuals with disabilities (e.g., lower education levels) were related to poor post-school and employment outcomes (Lim et al., 2013; Loprest & Maag, 2007; Sung et al., 2014). Sanford et al. (2011) identified significant findings from the National Longitudinal Transition Study-2 (NLTS-2) that young adults with disabilities are less likely to enroll in post-secondary school since leaving high school compared to their same age peers without disabilities (54.9% vs. 62.1%); and young adults with disabilities who do not complete high school were less likely to be employed than those with disabilities who complete high school (52% vs. 73%). These findings underscore the importance of addressing learning needs of students with disabilities.

Increased Needs of Students with and at Risk for Disabilities in High-Poverty Contexts

Poverty is a strong cultural factor that diversifies individual's performance at schools. Living in poverty is associated with poor academic performance and school behaviors (Baker et al., 2006; Becker & Luthar, 2002; McLoyd, 1998; Raver et al., 2007). The Every Student Succeeds Act (ESSA, 2015) requires schools to support all students to close the achievement gap between high- and low-achieving students by improving the school achievement (e.g., reading proficiency) of students in poverty and those with or at risk for disabilities. NAEP (2017) provided supportive reports that, for example, 4th and 8th graders eligible for free or reduced-price lunch (FRPL) under the National School Lunch Program (NSLP), including students at risk (e.g., English Language Learners [ELLs]) and those with disabilities, scored lower in reading and math than their peers ineligible for FRPL (see also Herbers et al., 2012; Okpala et al., 2000). The student population living in poverty also received low scores on standardized tests and report low overall GPA (Caldas & Bankston, 1997; Malecki & Demaray, 2006).

Moreover, persistent academic underachievement and behavior issues leave students living in low-income households at higher risks for dropout compared to students living in higher income households. NCES (2018) reported in 2014 that the dropout rate for 15- to 24-year-old students in 10th through 12th grade from low-income families is higher than the rates for their peers from middle-income and high-income families (9.4%, 5.4%, and 2.6%, respectively). Given that 21% of children with and without disabilities under age 18 were living in poverty in the U.S. in 2014 (NCES, 2017), there is an increased need to improve school performance of students in high-poverty contexts and to prevent them from experiencing school failure.

ESSA (2015) requires the use of evidence-based practices (EBPs) for students with disabilities who academically underperform in schools. In addition, IDEA (2004) specifically mandates schools to provide students with disabilities with EBPs. However, poverty makes students with and at risk for developing disabilities as double disadvantaged learners as well as leads to increased academic disparities. Compared to students with disabilities not living in high-poverty context, those living in high-poverty context are more vulnerable to experience school failure due to the impact of poverty on their educational outcomes (Engle & Black, 2008). Stanford et al. (2011) pinpointed findings from NLTS-2 that compared to young adults with disabilities from higher-income families (more than $50,000), those from lower-income families ($25,000 or less) were less likely to have enrolled in a post-secondary school, 2-year or community college, 4-year college, and have a paid job (68.0% vs. 43.0%, 49.0% vs. 24.0%, 22.0% vs. 8.0%, and 79.0% vs. 58.0%, respectively). These findings underline a relatively increased need for supporting students with disabilities living in poverty with more EBPs.

To further our understanding of school outcomes of students living in high-poverty contexts, including those with disabilities and at risk for developing disabilities, researchers have conducted some reviews of the literature. Khattri et al. (1997) reviewed research on the impact of poverty on academic achievement of at-risk students in poor rural and urban areas; their findings show that academic achievement of poor rural students is relatively

Table 1
Levels of Search Terms

Search Levels	Outcome Terms
Level 1	School based OR classroom based OR classroom
Level 2	Disability OR disabilities OR disabled OR special needs OR at risk
Level 3	Intervention OR treatment OR therapy OR program OR strategy OR instruction OR evidence based intervention OR evidence based instruction OR evidence based practice
Level 4	Poverty OR low income OR low socioeconomic*

low but higher than that of poor urban students and the magnitude of academic achievement deficits is smaller in poor rural areas than in poor urban areas. Qi and Kaiser (2003) summarized the body of research on problem behaviors of young children, including those with disabilities, in high-poverty contexts. They found that compared to the general population, students from low socioeconomic status (SES) backgrounds have higher prevalence rates of behavioral problems correlated with several risk factors that interfere with their performance at schools, including child and parent characteristics, parenting styles, and sociodemographic effects [low SES]). Murry et al. (2011) synthesized studies that investigated the linkage between neighborhood poverty and school related achievement of adolescents. They found direct effects of neighborhood poverty on adolescents' academic achievement, specifically the correlation between low reading and math testing scores and high dropout rates).

The above reviews have presented compelling evidence of the academic deficits and school failures experienced by students living in poverty, including those with disabilities and at risk for developing disabilities. However, there has not yet been a comprehensive review of studies examining the effects of interventions on positive school outcomes for all students with and at risk for developing disabilities, ages 3 through 21, in high-poverty contexts. The purpose of this review was to evaluate the effects, evidence base, and cultural responsiveness of interventions that were designed to support school outcomes of learners with disabilities and at risk of developing disabilities in high-need contexts. Given that socioeconomic status, including poverty, might be considered as a part of individual's cultural and social identity (Trainor & Bal, 2014), knowing how individuals in the high-need contexts due to low SES or poverty, has been supported through research should be examined. It is also important to examine the methodological rigor and quality of the research in this area to objectively determine the quality of information provided in research as well as to see where we are in this field. To reach this end, two evaluation rubrics were used, including a methodological rubric for intervention quality (Gersten et al., 2005; Kratochwill et al., 2013) and a rubric for culturally responsive research (CRR) to examine the cultural responsiveness within each research study (Trainor & Bal, 2014). The following research questions guided this review:

1. What interventions are used to improve school outcomes of low SES students with disabilities or at risk for developing disabilities?
2. What types of school behaviors or outcomes are targeted for each intervention?
3. To what extent do the research designs of studies reviewed meet quality indicators?
4. How are the included studies designed to meet the cultural and contextual needs of this specific student population?

METHODS

Inclusion Criteria

Inclusion criteria were established to determine eligible studies: (a) at least one student in the study had a diagnosed disability or was identified as 'at risk' of having a disability or learning difficulty, (b) participant(s) had low socioeconomic status (SES) or were in poverty contexts, (c) their ages were between 3-21 years old, (d) an experimental intervention(s) was conducted to improve school outcomes, (e) the intervention was implemented at school settings in the United States, (f) the study was published in a peer-reviewed journal, and (g) the study was published in English. If at least one student in the study had a diagnosis or was identified as "at risk", the outcomes of this one student were extracted for the analysis. School outcomes are related to comprehensive achievements and effects in schools including, but not limited to, academic, societal, behavioral, emotional, school performance and engagement, and life effects (Creemers & Kyriakides, 2010; Rosenfeld et al., 2000). School settings included any school contexts and conditions, such as general classrooms, special education settings, both instructional and non-instructional routines, daycares, and pre-K to high schools. We referred to the authors' report in each study about students' SES. Huston et al. (1994) defined that poverty and low SES are "not isomorphic" and one can be a broader term, more complicated phenomenon, or "more

Table 2
Characteristics of Reviewed Articles

	Participant Characteristics			
Reference	Number & Age	Disability	Ethnicity	Primary Language
Bernhard et al. (2008)	367*, 37.3-48.4 months	At risk for RD*	Hispanic, AA*, White, & Others	Spanish
Dilworth et al. (2002)	208, 7-10 years	At risk for learning difficulty	AA, White, & Others	English
Dyson et al. (2011)	121, kindergarten	At risk for MD*	AA, Hispanic, White, Asian, & Biracial	English
Gopalan et al. (2013)	91, 14-18 years	At risk for BD*	Hispanic, AA, & Others	English
Hagans & Good III (2013)	75, first-grade	At risk for RD*	White, Hispanic, Native American, AA, & Asian American	English
Hilbert & Eis (2013)	154, average 4.7 years	At risk for RD	White, AA, Native American, & Others	English
Justice et al. (2003)	18, 48-60 months	At risk for RD	AA	English
Justice et al. (2010)	137, 39-66 months	At risk for RD	AA & White	English
Kelley et al. (2015)	18, average 4.5 years	At risk for RD	AA	English
Lonigan et al. (1999)	95, 2-5 years	At risk for RD	AA	English

Table 2, *extended*

School Outcome	Intervention Component	Results
Reading and literacy skills (phonological awareness, phonemic awareness, fluency, vocabulary, and text comprehension)	EAP*: incorporating students' home language into classroom discussion; bring in technology and book-making equipment (e.g., computers, digital cameras, etc.); create self-authored story book texts; share stories among families; share, display, and disseminate self-authored books.	P*
Social and emotional competence	*Talking with TJ program*: video series including components of "Team work Building" & "Conflict Resolution", targeting to improve team-work skills.	P
Number sense (counting, comparing, and manipulating sets)	Number sense instruction: including number recognition game, number sequencing, verbal subtilizing, finger use, etc.	P
Behavioral difficulties and dropping out of high school, participation	*Project Set-up*: including youth-centered group discussion, activities, practice, and application life skills (e.g., communication with others, initiating and maintaining relationships, stress management).	P
Phonological awareness skills (identifying initial and final phonemes; segmenting and blending phonemes; counting and adding phonemes; subtracting initial and final phonemes; and letter-sound correspondence)	*PAEYC** program: instructional design including signaling, precorrection, using manipulatives to represent concepts, reviewing previously taught skills.	P
Emergent literacy skills (vocabulary, phonological awareness, and print knowledge)	*RIA**: Utilizing the repeated use of children's storybooks to facilitate the development of language and literacy skills in young children	P
Literacy skills (written language and phonological awareness)	Emergent literacy intervention- small group sessions engaged children in activities to promote their attention to written language and oral language; and individual sessions focused on name writing, alphabet recitation, and phonological awareness games.	P
Language and emergent literacy skills (repetition of material and integration across skills)	*RIA*	P
Oral language skills (vocabulary and comprehension)	SF*s- addressing vocabularies and answering questions about the story while listening to the story, interacting with a prerecorded storybook and encouraged to respond to the narrator. The SFs materials included storybooks, prerecorded audio, mp3 players, and headphones.	P
Emergent literacy skills (oral language, phonological sensitivity, and listening comprehension)	Center-based dialogic reading (one-on-one role-plays, provide feedback on the use of dialogic reading guidelines) and typical shared-reading (read text of book, commented on the pictures, and answered children's questions).	P

Table 2, *continued*

	Participant Characteristics			
Reference	Number & Age	Disability	Ethnicity	Primary Language
Nielsen & Friesen (2012)	28, kindergarten	At risk for RD	AA, White, Hispanic, & Asian	English
Schacter & Jo (2015)	227, 56.1-55.7 months	At risk for MD	Hispanic, AA, & White	English
Taylor-Ritzler et al. (2001)	41, 14-19 years	ID*, LD*, & PD*	Hispanic, White, & AA	English
Ukrainetz et al. (2009)	41, 5.0- 6.3 years	At risk for RD	Hispanic & White	English
Vadasy et al. (2006)	75, kindergarten	At risk for RD & With SpEd services	Minority= non-Caucasian heritage	English
VanDerHeyden et al. (2007)	35, pre-K	At risk for LD	AA, Hispanic & White	English
Yurick et al. (2012)	38, kindergarten	At risk for RD	AA, White, Hispanic, & Multiracial	English
Ziolkowski & Goldstein (2008)	13, 4.2-5.4 years	At risk for RD	AA, European American, & Hispanic	English

Note. The number of participants include all subject (e.g., intervention and control groups) who participated in each research study. AA=African American, BD= behavioral disorder, EAP= early literacy intervention program, ID= intellectual disability, LACES & T= Literacy Across Columbus Elementary Schools & Trophies, LD= learning disability, MD= math difficulty, M= math, RD=reading difficulty, PD= physical disability, PAEYC= Phonemic Awareness in Young Children Curriculum, P=Positive, RIA= Read It Again! SFs= Story Friends

volatile" over the other (p. 277). In the current literature review, however, we highlighted common characteristics of the two terms, an economic hardship and the effect of hardship on their status, which might make children's learning environments 'high-need contexts'. The years of publication were not limited, but the included publications were within the years of 1975-2018 (February). The year of 1975 was the earliest year that the search engines at a university allowed for an electronic search.

Search Procedures

Two steps of searching were conducted to identify the eligible studies that meet the purpose of this review. First, an electronic search was conducted using two databases simultaneously: ERIC and PsycINFO. The search was conducted using the following four levels of search terms. Table 1 depicts the four levels of search terms. The electronic search yielded 849 results. After reviewing those articles based on the inclusion criteria, 10 articles

Table 2, *extended, continued*

School Outcome	Intervention Component	Results
Reading skills (vocabulary and narrative development)	Storybook-based intervention- use a small-group model instruction to improve story retelling abilities focusing on word learning and narrative directly related to the books.	P
Mathematics skills (e.g., subitizing, counting, matching different quantity representations, numeral identification)	*Math Shelf* intervention, an iPad preschool mathematics curriculum, transform physical manipulatives (colored beads, dot cards. . .) to different activities.	P
Transition related skills (person-centered planning, student development, interagency collaboration, family involvement, and program evaluation)	*Choices-in-Transition* intervention- included three components: person-centered goal setting, help-recruitment training, and intensive individualized case management support.	P
Phonemic awareness skills (first- and last-phoneme isolating, phoneme blending, and segmenting)	Explicit skill instruction with an array of teaching strategies (individual child responses or learning episodes; modeling, choral answering, and other responses; and scaffolds).	P
Reading skills (translating print to sound and blending phonemes)	Following the self-teaching model, provide explicit supplemental one- to- one instruction in alphabetic and phonemic decoding skills from paraeducators.	P
Phonic awareness skills (beginning word sounds, letter naming, phoneme segmentation, and nonsense-word decoding)	Early literacy instruction with stimulus cards, intervention steps included naming the stimulus items, asking the child to identify the correct response, and immediately presenting the next stimulus card).	P
Phonemic awareness skills (phonics, phonemic awareness, writing, vocabulary, fluency, and comprehension)	*LACES & T** reading programs- all activities were direct in nature and of short duration, including whole-group choral responding to sight words, independent writing, teacher-led discussion.	P
Phonological Awareness skills (alphabet knowledge, print awareness, name writing, phonological segmentation, and rhyme production)	Explicit emergent literacy intervention embedded within the contexts of shared book reading.	P

were identified. To ensure reliability of research outcomes, the third author reviewed all of the 849 articles, the first author reviewed 429, and the second author reviewed the remaining 420 articles. We reached 100% agreement on the research outcomes. The reliability was computed by having the total number of agreements divided by total number of agreements plus disagreements (Kennedy, 2005). The first and third authors then independently reviewed the references of the 10 identified articles manually and found an additional eight articles. We reached 100% agreement on this search process. A total of 18 articles, therefore, were included in this review.

Data Analysis

First, the 18 studies identified were analyzed across types of interventions (independent variables) and types of school outcomes (dependent variables). Demographic information, including the number of participants, age, type of disability, ethnicity, and participants' primary language were also reported (see Table 2).

Second, the research design of each of the 18 studies was identified (e.g., group experimental, single case design) and coded using relevant research indicators. For example, group and/or quasi experimental studies were evaluated by the quality indicators developed by Gersten et al. (2005).

Each study included in this review was coded based on the themes of (a) research concept, (b) participants, (c) intervention, (d) outcome measures, and (e) data analysis (Gersten et al., 2005). These five themes were specified into 24 rubric items. We also coded single case studies using the quality indicators for single cases by Kratoch will et al (2013). We coded each study that utilized single case design based on the seven themes of (a) participants and setting, (b) dependent variable, (c) independent variable, (d) baseline, (e) experimental control/internal validity, (f) external validity, and (g) social validity. These seven themes were specified into 21 rubric items. Each rubric item was scored by Yes (described) or No (not described or uncertain).

Of the 18 studies identified, 16 utilized a group and/or quasi experimental designs. One study utilized a single case research design (Ziolkowski & Goldstein, 2008). The remaining one study (Kelley et al., 2015) used a group design with an embedded single case design. Thus, Kelley et al.'s (2015) study was evaluated by using the two research design quality indicators.

Third, in order to evaluate the extent to which the 18 studies identified addressed cultural and contextual needs, a rubric for culturally responsive research (CRR; Trainor & Bal, 2014) was adopted. In this rubric, Trainor and Bal (2014) provided a set of widely accepted criteria to evaluate experimental research that focused on an enhancement of the overall research quality. According to their CRR rubric, each of the 18 studies was examined across 15 items including: foundational construct, research relevancy, narratives of literature, theoretical framework, participants demographics, researchers and interventionists' characteristics, sampling procedures, research setting, data collection description, intervention ecology, intervention design, intervention assessment, report of findings, analysis and interpretation, and results dissemination. Each of these 15 rubric items was scored by a 3-point Likert Scale, where a score of 0 was equivalent to lack of consideration of cultural factors, or a "culture-blind approach", a score of 1 was equivalent to independent categorization of cultural variables such as social class and race as factors that create variations in the perspectives and behaviors of the participants, and finally a score of 2 was equivalent to intersectional conceptualization of contextual and cultural factors based on and designed for real-life practice (Trainor & Bal, 2014, p. 206). The use of the CRR rubric was selected to determine if the component of culturally responsive teaching practices was addressed in each study for student participants living in poverty, including those with disabilities and at risk for developing disabilities. The authors followed the detailed decision rules to code each study.

The Roles of Coders and Inter-Coder Reliability

To ensure the quality of coding, several steps were taken in this review. First, the third author coded the studies across types of interventions, types of school outcomes, and participants' demographic information. The first author separately coded seven studies (38.88%) to ensure the reliability of coding and this coding was compared with the third author's coding. The reliability was calculated using an item-by-item method (Cooper et al., 2007) by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. Agreement for data analysis was 90.47%.

Second, the third author served as the primary coder and coded the design qualities of 17 group or quasi-experimental studies. The first and second authors reviewed two and four random studies respectively for reliability coding (six studies; 33.33 %). Agreement for data analysis was 87.5 % (range = 83.33-91.67%). For the two studies that utilized single case research design (Kelley et al., 2015; Ziolkowski & Goldstein, 2008), the second author served as the primary coder and the first author reviewed one study (50%) separately for reliability coding. Agreement for data analysis was 100%.

To ensure the accuracy of coding on the CRR rubric, the third author served as the primary coder and the second author separately used the rubric to review eight randomly selected articles (44.44%). Agreement was reached at 83.33% (Range = 73.33- 93.33%). Following each type of reliability checking, the authors discussed each disagreement and negotiated judgement until 100% agreement was reached.

RESULTS

Summary of Studies Reviewed

The 18 studies that met the inclusion criteria for this literature review included 1,782 participants in total. Each study included 13 to 367 participants. The participants' ages ranged from 2 to 19 years old. Most studies ($n = 14$) included young children who were 6 years or younger. Only four studies included participants whose ages ranged between 7 and 19 years old (Dilworth et al., 2002; Gopalan et al., 2013; Hagans & Good III, 2013; Taylor-Ritzler et al., 2001). In most studies ($n = 17$), a majority of participants had developmental delays or were at risk for developing disabilities or learning difficulties (e.g., reading, literacy, behavioral issues, math). The participants in the remaining one study were diagnosed with intellectual, learning, and physical disabilities (Taylor-Ritzler et al., 2001). In most studies ($n = 16$), the participants' primary languages were English only, but diverse racial/ethnic backgrounds were identified. Most studies ($n = 15$) focused on delivering interventions for two or more racial groups of students (e.g., Hispanic, African American, White, and Others; Bernhard et al., 2008). Table 2 summarizes the detailed study information.

Table 3
Percentages for Rubric Item Description from the Quality Indicators for Group and Quasi-Experimental Research Across Studies

	Total (%)	
Citations	Yes*	No*
Bernhard et al. (2008)	66.7%	33.3%
Dilworth et al. (2002)	58.3%	41.7%
Dyson et al. (2011)	62.5%	37.5%
Gopalan et al. (2013)	50.0%	50.0%
Hagans & Good III (2013)	75.0%	25.0%
Hilbert & Eis (2013)	70.8%	29.2%
Justice et al. (2003)	54.2%	45.8%
Justice et al. (2010)	75.0%	25.0%
Kelley et al. (2014)	66.7%	33.3%
Lonigan et al. (1999)	62.5%	37.5%
Nielsen & Friesen (2012)	70.8%	29.2%
Schacter & Jo (2015)	58.3%	41.7%
Taylor-Ritzler et al. (2001)	70.8%	29.2%
Ukrainetz et al. (2009)	91.7%	8.3%
Vadasy et al. (2006)	79.2%	20.8%
VanDerHeyden et al. (2007)	66.7%	33.3%
Yurick et al. (2012)	62.5%	37.5%
Average	67.2%	32.8%

Note. Yes (described respective items), No (not described or uncertain)

School Outcomes and Intervention Components

The majority of studies ($n = 13$) focused on improving participants' reading, language, or literacy related skills. In particular, as many of the studies included young students with disabilities or difficulties due to high poverty, diverse emergent literacy skills were identified and taught (e.g., print knowledge, vocabulary, phonological awareness). These literacy skills were taught through various types of interventions, but the major format used in most studies ($n = 7$) was related to reading stories or story books. Other procedures are related to, for example, game, small group instructions, prompting and stimulus cards.

In two studies (Dyson et al., 2011; Schacter & Jo, 2015), mathematic skills were the focus (e.g., number concepts, subitizing, matching, counting). Dyson et al. (2011) provided number sense instruction, including components of number recognition game, verbal subtilizing, and finger use. Schacter and Jo (2015) utilized *Math Shelf* intervention with iPads. Other student outcomes identified in this review include transition-related skills (Taylor-Ritzler et al., 2001) with a *Choices–in-Transition* intervention and social/emotional competence (Dilworth et al., 2002). Dilworth et al. (2002) incorporated "*the Talking with TJ teamwork-building series"* which was prepared as a form of video-based instruction for students' social and emotional development. The authors of all 18 studies reported positive results.

Quality of the Studies Reviewed

First, of the 17 group design studies reviewed, only one study (Ukrainetz et al., 2009) met higher than 90% of rubric items on the quality indicator by Gersten et al. (2005). Six studies satisfied the criteria between 70% and 89%. The remaining 10 studies satisfied the rubric items between 50% and 69.9%. See Table 3 for the analysis of quality indicators for group and quasi-experimental research. Next, for the two single-case designed research studies, Ziolkowski and Goldstein (2008) met all 21 rubric items in the quality indicators defined by Kratochwill et al. (2013). The study by Kelley et al. (2015) satisfied all rubric items except four items related to social validity measures (80.95% of rubric items).

Second, we investigated how each rubric item was described across studies, by analyzing the percentages of Yes (described) and No (not described or uncertain) for each rubric item across the 17 group design studies. See Table 4 for the summary. We found that all of the 17 studies clearly described 10 of the 24 rubric items. (i.e., research concept—literature, research concept—sound, research concept—importance, participants—description, intervention—description, outcome measures—multiple measure, outcome measures—measurement, data analysis—appropriate, data analysis—unit, and data analysis—effect size). Of the 24 rubric items, two items were described across 80% of the identified studies (i.e., research concept—research questions, and outcome measure—reliability and validity). Over 50% of the identified studies presented four other rubric items (i.e., participants—group equivalency, participants—interventionists, intervention—condition difference, and outcome measures—IOA). The remaining eight rubric items were described by under 50% of the identified studies (i.e., participants—attrition, participants—interventionist equivalency, intervention—fidelity, intervention—compare conditions, outcome measure—blind, data analysis-variability, data analysis—power analysis, and data analysis—power analysis levels).

Cultural Responsiveness of the Studies Reviewed

We applied the CRR rubric (Trainor & Bal, 2014) to each identified study and Table 5 provides the total percentage of 0s, 1s and 2s coding for each study. We did not find any evidence that would warrant a score of 2 on any rubric items across the 18 identified studies. All of the 18 studies were scored 0 and 1 across the rubric items. Bernhard et al.(2008) received 100% with a score of 1 on

Table 4
Analysis per Quality Indicators for Group and Quasi-Experimental Research in Special Education

Rubric Item	Bernhard et al. (2008)	Dilworth et al. (2002)	Dyson et al. (2011)	Gopalan et al. (2013)	Hagans & Good III (2013)	Hilbert & Eis (2013)	Justice et al. (2003)	Justice et al. (2010)	Kelley et al. (2014)	Lonigan et al. (1999)
CON_Literature	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CON_Sound	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CON_Importantce	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CON_ResQuestion	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
PART_Description	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PART_GroupEquiv	Y	Y	Y	N	Y	Y	N	Y	Y	N
PART_Attrition	N	Y	N	Y	N	Y	N	N	N	N
PART_Interventionists	Y	N	N	N	Y	Y	N	N	N	Y
PART_IntEquivalency	Y	N	N	N	Y	N	N	N	N	N
INT_Description	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
INT_Fidelity	N	N	Y	N	N	Y	N	N	Y	N
INT_CompareCond	N	N	N	N	Y	N	N	Y	N	N
INT_CondDifference	Y	Y	Y	N	Y	Y	N	N	Y	Y
DV_MultipleMeasure	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DV_ReliValid	Y	Y	N	N	Y	Y	N	Y	Y	Y
DV_Measurement	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DV_Blind	N	N	N	N	N	N	Y	Y	N	N
DV_IOA	N	N	N	N	Y	N	N	Y	Y	Y
DA_Appropriate	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DA_Unit	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DA_EffectSize	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DA_Variability	N	N	N	N	N	N	Y	Y	N	N
DA_PowerAnalysis	N	N	Y	N	N	N	N	Y	N	N
DA_Palevels	N	N	N	N	N	N	N	N	N	N

each rubric item. Six studies scored 1 on 80 % to 99% of the rubric items. Ten studies scored 1 in 50 % to 79 % of the rubric items. The remaining one study (Gopalan et al., 2013) scored 1 on fewer than 50% of the rubric items (46.7% of rubric items).

Table 6 provides a detailed analysis of cultural responsiveness for each study across rubric items. Noting that there was no score of 2 for any rubric items, we found that 100% of the studies earned a score of 1 on five rubric items (33.33% of rubric items; i.e., construct, relevancy, literature, participants, and data collect). On six rubric items (40%), more than 50% of studies scored 1s (range = 66.7%-88.9%). The remaining four rubric items (26.67%) mostly received scores of 0 (range of score of 0 = 61.6%-77.8%; i.e., dissemination, analysis and interpretation, intervention design, and researchers).

DISCUSSION

The purpose of the current, comprehensive literature review was to examine how students in high-poverty contexts have been supported in research for their school outcomes. In addition, we examined to what extent the research met the quality indicators. Results of this review indicated that most of the research studies reviewed focused on students' language, reading, and literacy skills, with various interventions. Methodologically, most group design studies met lower than 70% of quality indicators, although the single case studies met the rubric items by higher than 80%. As for the analysis of cultural responsiveness using the CRR rubric, we found that most studies included limited information reflecting culturally responsive research and teaching practices.

It is notable that from the demographic information analysis, we found that most studies included students

Table 4, *extended*

Nielsen & Friesen (2012)	Schacter & Jo (2015)	Taylor-Ritzler et al. (2001)	Ukrainetz et al. (2009)	Vadasy et al. (2006)	VanDerHeyden et al. (2007)	Yurick et al. (2012)	Total (%)	
							Yes	No
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
Y	N	Y	Y	Y	Y	Y	88.2%	11.8%
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
Y	Y	N	Y	Y	N	N	64.7%	35.3%
Y	N	N	Y	Y	Y	N	41.2%	58.8%
N	N	Y	Y	Y	Y	Y	52.9%	47.1%
N	N	N	Y	N	N	N	17.6%	82.4%
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
N	N	N	Y	Y	N	N	29.4%	70.6%
Y	Y	N	N	Y	N	N	29.4%	70.6%
Y	Y	N	N	Y	N	N	58.8%	41.2%
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
Y	Y	Y	Y	Y	Y	Y	82.4%	17.6%
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
N	N	N	Y	N	N	N	17.6%	82.4%
Y	N	Y	Y	N	Y	Y	52.9%	47.1%
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
Y	Y	Y	Y	Y	Y	Y	100.0%	0.0%
N	N	Y	Y	Y	Y	Y	41.2%	58.8%
N	N	Y	Y	N	N	N	23.5%	76.5%
N	N	Y	Y	N	N	N	11.8%	88.2%

living in poverty who were at risk for developing disabilities but not students who had disabilities. This finding may reaffirm that poverty is a strong risk factor that affects students' failures or developmental difficulties in school and later learning disabilities (Justice & Chow, 2013), and researchers stated the importance of support for such children from their young age to prevent school failures (e.g., Justice & Chow, 2013). With the support of research conducted, diverse and effective intervention strategies have been identified and applied to support high risk children for various positive school outcomes.

Compared to Trainor and Bal's (2014) preliminary analysis on six experimental studies in the area of transition with CRR rubrics (2014), findings of the current literature review show improvements in terms of the scores across the 18 studies reviewed. In the preliminary analysis by Trainor and Bal (2014), the six studies reviewed were scored mostly 0s. We found that the 18 studies reviewed were scored mostly 1s across rubric items. For example, in our 18 studies reviewed, the authors described participants' different characteristics and the construct under examination was clearly provided (i.e., construct, participants). The relevancy of the research problem was provided by linking to extant literature (i.e., relevancy, literature). Several possible reasons for this difference can be identified. First, it is possible that the 18 studies reviewed were more recently published (more studies in the last decade, n of studies = 13), and therefore put in the effort to address the recent, compelling needs (Trainor & Bal, 2014) to support diverse needs of marginalized student populations. Second, the 18 studies reviewed were specifically designed to address the issue of poverty. Given that poverty is understood as a contributor to children's divergent development (Qi & Kaiser, 2003) and a risk factor that critically affects an individual's cultural experience and identities, the recent trend to embed culturally responsive pedagogy in experimental research is meaningful.

Table 5
Coding Results for Each Study per CRR Rubric

	Total (%)		
Citations	Zero	One	Two
Bernhard et al. (2008)	0.0%	100.0%	0.0%
Dilworth et al. (2002)	46.7%	53.3%	0.0%
Dyson et al. (2011)	13.3%	86.7%	0.0%
Gopalan et al. (2013)	53.3%	46.7%	0.0%
Hagans & Good III (2013)	33.3%	66.7%	0.0%
Hilbert & Eis (2013)	33.3%	66.7%	0.0%
Justice et al. (2003)	26.7%	73.3%	0.0%
Justice et al. (2010)	26.7%	73.3%	0.0%
Kelley et al. (2014)	20.0%	80.0%	0.0%
Lonigan et al. (1999)	40.0%	60.0%	0.0%
Nielsen & Friesen (2012)	33.3%	66.7%	0.0%
Schacter & Jo (2015)	20.0%	80.0%	0.0%
Taylor-Ritzler et al. (2001)	20.0%	80.0%	0.0%
Ukrainetz et al. (2009)	33.3%	66.7%	0.0%
Vadasy et al. (2006)	6.7%	93.3%	0.0%
VanDerHeyden et al. (2007)	26.7%	73.3%	0.0%
Yurick et al. (2012)	20.0%	80.0%	0.0%
Ziolkowski & Goldstein (2008)	40.0%	60.0%	0.0%

However, the results from this current literature review still support the preliminary finding by Trainor and Bal (2014), stating that in our field of special education, some realms of the CRR rubric have not been explicitly considered or discussed yet as the deciding factors of cultural responsiveness in research. We found that only a few indicators were the common foci in the description of research, while several CRR quality indicators were not presented in most studies. Moreover, no studies were given a score of 2 in any of the CRR rubric items. Given that "a score of 2 considers and represents the intersectionality of dynamic cultural variables" (Trainor & Bal, 2014, p. 210), cultural responsiveness in intervention research can be improved through the understanding of complexity of culture which the research participants embody as well as theoretical frameworks of cultural responsiveness that should be embedded through the whole process of research (Vincent et al., 2011).

In an effort to ensure that positive student outcomes are achieved, the field of special education made a recent shift in emphasizing the use of EBPs when teaching students with disabilities (Every Student Succeeds Act, 2015). Concurrently, there was increased scrutiny over the quality of research produced by the field. In response, *Exceptional Children* provided an overview of the quality indicators for various types of research designs utilized in special education research, including group and quasi-experimental (see Gersten et al., 2005) and qualitative research design (see Brantlinger et al., 2005). The quality indicators for

Table 6
Analysis of Cultural Responsiveness for Each Study across Rubric Items

Rubric Item	Bernhard et al. (2008)	Dilworth et al. (2002)	Dyson et al. (2011)	Gopalan et al. (2013)	Hagans & Good III (2013)	Hilbert & Eis (2013)	Justice et al. (2003)	Justice et al. (2010)	Kelley et al. (2014)	Lonigan et al. (1999)
Construct	1	1	1	1	1	1	1	1	1	1
Relevancy	1	1	1	1	1	1	1	1	1	1
Literature	1	1	1	1	1	1	1	1	1	1
Theoretical	1	0	1	0	0	1	1	0	1	0
Participants	1	1	1	1	1	1	1	1	1	1
Researchers	1	0	0	0	0	0	1	1	0	0
Sampling	1	1	1	0	1	1	1	1	1	0
Setting	1	1	1	0	1	1	1	1	1	1
Data collect	1	1	1	1	1	1	1	1	1	1
Intervention	1	1	1	1	0	1	1	0	1	1
Intervention design	1	0	1	0	0	0	0	0	1	0
Assess intervention	1	0	1	0	1	1	1	1	0	1
Finding present	1	0	1	1	1	0	0	1	1	1
Analysis and Interpretation	1	0	1	0	0	0	0	1	0	0
Dissemination	1	0	0	0	1	0	0	0	1	0

single case experimental was also provided by Kratochwill et al. (2013). On average, studies utilizing group and quasi-experimental research design addressed 67.8% (range = 50 to 91.7 %) of the quality indicators. With only five of the 18 studies reviewed that were published before the dissemination of the special issue outlining the research design quality indicators, we anticipated the number of studies meeting the quality indicators would be substantially higher. With the population of students with disabilities becoming increasingly diverse (Harry & Klingner, 2014), it is essential that researchers acknowledge and adhere to the established research design quality standards in any scientific pursuits evaluating the impact of cultural responsiveness of interventions to ensure the advancement of the field's knowledge and improvement in practice by professionals in the field.

Limitations

The findings of this current literature review, however, should be interpreted with consideration of a few limitations. First, although we thoroughly examined the accuracy and calculated the reliabilities of our search process, it may have inadvertently excluded some eligible studies that met the inclusion criteria. For example, we only relied on two search engines (ERIC and PsycINFO) as being the most reliable and resourceful in the field of education, and we did not conduct a manual search of journals that focus on poverty issues in special education, ancestry or descendant search. These manual processes may yield additional articles that should have been included in this review. Second, although we reported the results from each study, we did not examine the effect size of intervention results that may be helpful to compare with the effects of intervention strategies. As such, no inferences should be drawn regarding intervention components with the most effective strategies. Third, we reviewed the intervention research conducted within the United States and published in English. Taken together, the generalizability of the findings might be limited.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The major body of studies included in this review focused on the development of students at risk and the impact of poverty on the students' school failure and learning difficulties. This finding may indicate a significance of systematic preventive efforts, such as prevention programs at high-poverty schools (e.g., school-wide positive behavioral supports), so all students in high-poverty can benefit from the effective interventions that preclude the school failure or development of challenging behaviors (e.g., drop-out, learning delay). In addition, we found that there is limited research and evidence regarding the investigation of interaction effects between poverty and disability on the development of students who were diagnosed with disabilities. Future research might investigate effective and intensive intervention strategies that could support students with diagnosed disabilities at schools.

Table 6, *extended*

Nielsen & Friesen (2012)	Schacter & Jo (2015)	Taylor-Ritzler et al. (2001)	Ukrainetz et al. (2009)	Vadasy et al. (2006)	VanDerHeyden et al. (2007)	Yurick et al. (2012)	Ziolkowski & Goldstein (2008)	Total %		
								Zero	One	Two
1	1	1	1	1	1	1	1	0.0%	100.0%	0.0%
1	1	1	1	1	1	1	1	0.0%	100.0%	0.0%
1	1	1	1	1	1	1	1	0.0%	100.0%	0.0%
1	1	1	1	1	1	1	1	27.8%	72.2%	0.0%
1	1	1	1	1	1	1	1	0.0%	100.0%	0.0%
0	0	0	0	1	0	0	0	77.8%	22.2%	0.0%
1	1	1	1	1	0	1	1	16.7%	83.3%	0.0%
0	1	1	0	1	1	1	0	22.2%	77.8%	0.0%
1	1	1	1	1	1	1	1	0.0%	100.0%	0.0%
1	1	1	1	1	1	1	1	11.1%	88.9%	0.0%
0	0	0	0	1	0	0	0	77.8%	22.2%	0.0%
0	1	1	0	1	1	1	0	33.3%	66.7%	0.0%
1	1	1	1	1	1	1	1	16.7%	83.3%	0.0%
0	0	0	0	1	1	1	0	66.7%	33.3%	0.0%
1	1	1	1	0	0	0	0	61.1%	38.9%	0.0%

Moreover, the majority of intervention studies entailed in this review targeted children at the age of six years or younger. Only four studies were implemented on individuals between the ages of 7-19 years, with only one study focused on social skill development and one on transition-related skills readiness. Future researchers and practitioners might investigate the effects of interventions on older age groups for various school outcomes. This may also yield convincing details in revealing if the factor of poverty portends a continuous detrimental influence on these students' participation in academics.

Most studies reviewed and evaluated in this review provided limited information on quality indicators (i.e., fidelity of intervention implementation, comparison of interventionists across conditions, attrition, and effect size). This finding may indicate the need for future researchers to explore their research areas with the consideration of quality indicators for their respective methodology not only to provide more detailed information about the research but also to demonstrate strong methodological rigor.

Lastly, while some CRR rubric items were commonly described across studies reviewed, many items were not described in the major body of studies reviewed. Findings of this review affirmed that it is imperative to provide culturally responsive teaching practices to students with diverse backgrounds and living in poverty. The use of culturally responsive practices could promote accessibility in learning for the vulnerable student population involved in research studies. Future experimental researchers for individuals with diverse backgrounds, including those in high-poverty contexts, might consider the different tenets of CRR throughout their process of research. Particularly, more research is required to understand the relationship between different cultural factors and students' learning outcomes as well as the types of intervention techniques that most effectively support diverse learners' schooling experiences in high-poverty contexts. Despite the fact that most studies included in this review identified students' diversity factors such as racial or ethnic identities in addition to the socioeconomic levels, not enough evidence of effective, culturally responsive intervention delivery was manifested among these studies. In order to address the critical themes in CRR, future researchers may include, for example, diversity factors of participants, contextualized institutional dimensions and relational positions among the participants and interventionists, cultural factors and dimensions in relation to participants' learning and development and finally, the responsiveness of intervention research to the effects of these factors (or intersectional factors).

REFERENCES

*Denotes studies reviewed in current study.

Baker, J. A., Kamphaus, R. W., Horne, A. M., & Winsor, A. P. (2006). Evidence for population-based perspectives on children's behavioral adjustment and needs for service delivery in schools. *School Psychology Review, 35*(1), 31-46.

Becker, B. B., & Luthar, S. S. (2002). Social-emotional factors affecting achievement outcomes among disadvantaged students: Closing the achievement gap. *Educational Psychologist, 37*(4), 197-214, doi:10.1207/S15326985EP3704_1.

Brantlinger, E., Jiminez, R., Klingner, J., Pugach, M., & Richardson, V. (2005). Qualitative studies in special education. *Exceptional Children*, *71*, 195-207.

Caldas, S. J., & Bankston, C. L., III (1997). Effect of school population socioeconomic status on individual academic achievement. *The Journal of Educational Research, 90,* 269-277.

Creemers, B., & Kyriakides, L. (2010). School factors explaining achievement on cognitive and affective outcomes: Establishing a dynamic model of educational effectiveness. *Scandinavian Journal of Educational Research, 54*, 263-294.

*Bernhard, J. K., Winsler, A., Bleiker, C., Ginieniewicz, J., & Madigan, A. L. (2008). "Read my story!" Using the Early Authors Program to promote early literacy among diverse, urban preschool children in poverty. *Journal of Education for Students Placed at Risk, 13,* 76-105.

*Dilworth, E. J., Mokrue, K., & Elias, M. J. (2002). The efficacy of a video-based teamwork-building series with urban elementary school students: A pilot investigation. *Journal of School Psychology, 40*(4), 329-346.

*Dyson, N. I., Jordan, N. C., & Glutting, J. (2011). A number sense intervention for low-income kindergartners at risk for mathematics difficulties. *Journal of Learning Disabilities, 46*(2), 168-181.

Engle, P. L., & Black, M. M. (2008). The effect of poverty on child development and educational outcomes. *Annals of the New York Academy of Sciences, 1136,* 243-256. doi: 10.1196/annals.1425.023

Every Student Succeeds Act of 2015, Pub. L. No. 114-95 § 114 Stat. 1177 (2015).

Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C., & Innocenti, M. S. (2005). Quality indicators for group experimental and quasi-experimental research in special education. *Exceptional Children*, *71*(2), 149-164.

*Gopalan, G., Alicea, S., Conover, K., Fuss, A., Gardner, L., Pardo, G., & McKay, M. (2013). Project Step-Up: Feasibility of a comprehensive school based prevention program. *Journal of Early Adolescence, 33*(1) 131-154.

*Hagans, K. S., & Good Iii, R. H. (2013). Decreasing reading differences in children from disadvantaged

backgrounds: The effects of an early literacy intervention. *Contemporary School Psychology, 17*(1) 103-115.

Harry, B., & Klingner, J. (2014). *Why are so many minority students in special education? Understanding race and disability in schools*. Teachers College Press.

Herbers, J. E., Cutuli, J. J., Supkoff, L. M., Heistad, D., Chan, C.-K., Hinz, E., & Masten, A. S. (2012). Early reading skills and academic achievement trajectories of students facing poverty, homelessness, and high residential mobility. *Educational Researcher, 41,* 366-374. doi:10.3102/0013189X12445320

*Hilbert, D. D., & Eis, S. D. (2013). Early Intervention for Emergent Literacy Development in a Collaborative Community Pre-Kindergarten. *Early Childhood Education Journal, 42,* 105-113.

Huston, A. C., McLoyd, V. C., & Coll, C. G. (1994). Children and poverty: Issues in contemporary research. *Child Development, 65,* 275-282.

Individuals with Disabilities Education Improvement Act of 2004, U.S.C. § 612 et seq. (2004).

*Justice, L. M., Chow, S., Capellini, C., Flanigan, K., & Colton, S. (2003). Emergent literacy intervention for vulnerable preschools. *American Journal of Speech-Language Pathology, 12,* 320-332.

*Justice, L. M., McGinty, A. S., Cabell, S. Q., Kilday, C. R., Knighton, K., & Huffman, G. (2010). Language and literacy curriculum supplement for preschoolers who are academically at risk: A feasibility study. *Language Speech and Hearing Services in Schools, 41,* 161-178.

*Kelley, E. S., Goldstein, H., Spencer, T. D., & Sherman, A. (2015). Effects of automated Tier 2 storybook intervention on vocabulary and comprehension learning in preschool children with limited oral language skills. *Early Childhood Research Quarterly, 31,* 47-61.

Kennedy, C. H. (2005). *Single-case designs for educational research*. Pearson.

Khattri, N., Riley, K. W., & Kane, M. B. (1997). Students at risk in poor, rural areas: A review of the research. *Journal of Research in Rural Education, 13*(2), 79-100.

Kratochwill, T. R., Hitchcock, J. H., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2013). Single-case intervention research design standards. *Remedial and Special Education*, *34*(1), 26-38.

Lane, K. L., & Menzies, H. M. (2002). Promoting achievement and minimizing risks - phase I: The impact of a school-based primary intervention program. *Preventing School Failure, 47,* 26-32.

Lim, K. S., Wo, S. W., Wong. M. H. & Tan, C. T. (2013). Impact of epilepsy on employment in Malaysia. *Epilepsy & Behavior, 27,* 130-134.

*Lonigan, C. J., Anthony, J. L., Bloomfield, B. G., Dyer, S. M., & Samwel, C. S. (1999). Effects of two shared-reading interventions on emergent literacy skills of at-risk preschoolers. *Journal of Early Intervention, 22*(4), 306-322.

Loprest, P. & Maag, E. (2007). The relationship between early disability onset and education and employment. *Journal of Vocational Rehabilitation, 26,* 49-62.

Malecki, C. K., & Demaray, M. K. (2006). Social support as a buffer in the relationship between socioeconomic status and academic performance. *School Psychology Quarterly, 21*(4), 375-395, doi:10.1037/h0084129

McLoyd, V. C. (1998). Socioeconomic disadvantage and child development. *American Psychologist, 53*(2), 185-204.

Murry, V. M., Berkel, C., Gaylord-Harden, N. K., Copeland-Linder, N., & Nation, M. (2011). Neighborhood poverty and adolescent development, *Journal of Research on Adolescence, 21*(1), 114-128.

National Assessment of Educational Progress. (2017). *The nation's report card*. U.S. Department of Education. https://www.nationsreportcard.gov/reading_math_2017_highlights/

National Center for Educational Statistics. (2017). *Public high school 4-year adjusted cohort graduation rate (ACGR), by selected student characteristics and state: 2010-11 through 2015-16*. https://nces.ed.gov/programs/digest/d17/tables/dt17_219.46.asp

National Center for Educational Statistics. (2018). *Concentration of public school students eligible for free or reduced-price lunch*. https://nces.ed.gov/programs/coe/indicator_clb.asp

National Center for Educational Statistics. (2018). *Trends in high school dropout and completion rates in the United States*. https://nces.ed.gov/programs/dropout/ind_01.asp

Nelson, J. R., Benner, G. J., Lane, K., & Smith, B. W. (2004). Academic achievement of K-12 students with emotional and behavioral disorders. *Exceptional Children, 71*(1), 59-73. doi:10.1177/001440290407100104

*Nielsen, D. C., & Friesen, L. D. (2012). A study of the effectiveness of a small-group intervention on the vocabulary and narrative development of at-risk kindergarten children. *Reading Psychology, 33,* 269-299.

No Child Left Behind Act of 2001, Pub. L. No. 107–110, 115 Stat. 1425 (2002).

Okpala, C. O., Smith, F., Jones, E., & Ellis, R. (2000). A clear link between school and teacher characteristics, student demographics, and student achievement. *Education, 120,* 487-494.

Qi, C. H. & Kaiser, A, P. (2003). Behavior problems of preschool children from low-income families: Review of the literature. *Topics in Early Childhood Special Education, 23*(4), 188-216.

Raver, C. C., Gershoff, E. T., & Aber, J. L. (2007). Testing equivalence of mediating models on income, parenting, and school readiness for white, black, and Hispanic children in a national sample. *Child Development, 78*(1), 96-115. doi:10.1111/j.1467- 8624.2007.00987.x.

Rosenfeld, L. B., Richman, J. M., & Bowen, G. L. (2000). Social support networks and school outcomes: The centrality of the teacher. *Child and Adolescent Social Work Journal, 17*, 205-226.

Sanford, C., Newman, L., Wagner, M., Cameto, R., Knokey, A.-M., & Shaver, D. (2011). *The post-high school outcomes of young adults with disabilities up to 6 years after high school: Key findings from the National Longitudinal Transition Study-2 (NLTS-2)* (NCSER 2011-3004). Menlo Park, CA: SRI International.

*Schacter, J., & Jo, B. (2016). Improving low-income preschooler's mathematics achievement with Math Shelf, a preschool tablet computer curriculum. *Computers in Human Behavior, 55,* 223-229.

Sung, C., Muller, V., Jones, J. E., & Chan, F. (2014). Vocational rehabilitation service patterns and employment outcomes of people with epilepsy. *Epilepsy Research, 108,* 1469-1479.

*Taylor-Ritzler, T., Balcazar, F. E., Keys, C. B., Hayes, E., Garate-Serafini, T., & Ryerson Espino, S. (2001). Promoting attainment of transition-related goals among low-income ethnic minority students with disabilities. *Career Development for Exceptional Individuals, 24*(2), 147-167.

Trainor, A. A., & Bal, A. (2014). Development and preliminary analysis of a rubric for culturally responsive research. *The Journal of Special Education*, *47*(4), 203-216.

*Ukrainetz, T. A., Ross, C. L., & Harm, H. M. (2009). An Investigation of Treatment Scheduling for Phonemic Awareness with Kindergartners Who Are at Risk for Reading Difficulties. *Language Speech and Hearing Services in Schools, 40,* 86-100.

U.S. Department of Education (2017). *Thirty-ninth annual report to Congress on the implementation of the Individuals with Disabilities Education Act.* Author. https://www2.ed.gov/about/reports/annual/osep/2017/parts-b-c/39th-arc-for-idea.pdf

U.S. Department of Education (2018). *2015-16 civil rights data collection: School climate and safety*. Office for Civil Rights. https://www2.ed.gov/about/offices/list/ocr/docs/school-climate-and-safety.pdf

*Vadasy, P. F., Sanders, E. A., & Peyton, J. A. (2006). Code-oriented instruction for Kindergarten students at risk for reading difficulties: A randomized field trial with paraeducator implementers. *Journal of Educational Psychology, 98*(3), 508-528.

*Vanderheyden, A. M., Snyder, P. A., Broussard, C., & Ramsdell, K. (2008). Measuring response to early literacy intervention with preschoolers at risk. *Topics in Early Childhood Special Education, 27*(4), 232-249.

Vincent, C. G., Randall, C., Cartledge, G., Tobin, T. J., & Swain-Bradway, J. (2011). Toward a conceptual integration of cultural responsiveness and schoolwide positive behavior support. *Journal of Positive Behavior Interventions, 13*(4), 219-229.

Walker, H. M., & Colvin, G., & Ramsey, E. (1995). Antisocial behavior in school: Strategies and best practices. Brookes & Cole.

Walker, H. M., & Severson, H. (2002). Developmental prevention of at risk outcomes for vulnerable antisocial children and youth. In K. L. Lane, F. M. Gresham, & T. E. O'Shaughnessy (Eds.), *Interventions for children with or at risk for emotional and behavioral disorders* (pp. 177-194). Allyn & Bacon.

*Yurick, A., Cartledge, G., Kourea, L., & Keyes, S. (2012). Reducing reading failure for kindergarten urban students: A study of early literacy instruction, treatment quality, and treatment duration. *Remedial and Special Education, 33*(2), 89-102.

*Ziolkowski, R. A., & Goldstein, H. (2008). Effects of an embedded phonological awareness intervention during repeated book reading on preschool children with language delays. *Journal of Early Intervention, 31*(1), 79-90.

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