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A meta-analysis of the academic achievement of students with emotional/behavioral disorders in traditional public schools in the United States.

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A META-ANALYSIS OF THE ACADEMIC ACHIEVEMENT OF STUDENTS WITH EMOTIONAL/BEHAVIORAL DISORDERS IN TRADITIONAL PUBLIC SCHOOLS IN THE UNITED STATES

By

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ABSTRACT

A META-ANALYSIS OF THE ACADEMIC ACHIEVEMENT OF STUDENTS WITH EMOTIONAL/BEHAVIORAL DISORDERS IN TRADITIONAL PUBLIC SCHOOLS IN THE UNITED STATES

Dana Greene-Page

April 5, 2023

Extensive research has been conducted on students with emotional and behavioral disorders (EBD) and their rates of challenging behavior. Less attention has been given to their academic achievement and outcomes. Recent research examining outcomes for students with EBD has indicated that these students receive lower grades, are less likely to pass classes, and experience higher rates of school dropout than students without disabilities and students with other high incidence disabilities. Given that between 2% and 20% of the school-age population is likely to have EBD (though many may not be identified as such), this is no small problem. Despite the need for increased examination of this population's academic achievement, research on the actual performance of students with EBD has been minimal. This study reports the results of a meta-analysis of the academic achievement of students with EBD, including effect sizes of assessment scores and discussion of moderators potentially impacting academic outcomes. Researchers conducted a thorough literature search to identify potentially relevant documents before screening studies for inclusion in the systematic review. Screening identified 16 studies that reported results of academic assessment scores for students with EBD and another 12 studies that have partial results and may be usable in the future. These studies were coded to extract data across multiple descriptive domains, including school context, placement of students, student demographics, and academic assessment scores. Results indicated a relationship between

EBD disability status and academic assessment scores, with EBD students scoring, on average, approximately .86 standard deviations below their non-EBD peers: despite a lack of association between EBD eligibility and lower intellectual ability. Quantitative analysis of assessment results yielded effect sizes for academic achievement of student participants, indicating lower performance levels and potential moderators (e.g., race, socioeconomic status, and gender) impacting student academic performance. In addition to discussing results of the meta-analysis, implications and areas for future research, policy, and practice are discussed.

Keywords—students with emotional and behavioral disorders, academic achievement, meta-analysis, effect size

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CHAPTER 1

INTRODUCTION

Prior to 1975, the American classroom looked quite different than it does today. Students with disabilities were not educated in the same schools as their peers. Students who were diagnosed as having severe emotional/behavioral problems were excluded completely from education. Students with disabilities have been characterized as inefficient learners who cannot easily access and coordinate the multiple mental processes needed for academic learning (Swanson, 1989). Students with severe disabilities (including those with emotional/behavioral difficulties) were viewed as uneducable, often resulting in denied access to education and learning opportunities (Martin, Martin, & Terman, 1996).

Throughout educational history, there have been several key laws that altered the landscape of education in America. The first occurring on November 29, 1975, when President Gerald Ford signed into law the Education for All Handicapped Children Act Public Law 94-142, or the EHA. The EHA guaranteed a free, appropriate public education, or FAPE, to each child with a disability in every state and locality across the country. The four purposes of the EHA were: 1) to assure that all children with disabilities have available to them…a free appropriate public education which emphasizes special education and related services designed to meet their unique needs, 2) to assure that the rights of children with disabilities and their parents…are protected, 3) to assist States and localities to provide for the education of all children with disabilities, and 4) to assess and assure the effectiveness of efforts to educate all children with disabilities. The law authorized financial incentives to enable states and localities to comply with the EHA. The EHA was a response to Congressional concern for two groups of children: the more than 1 million children with dis-

abilities excluded entirely from the education system and the children with disabilities who had only limited access to the education system and were therefore denied an appropriate education. This latter group comprised more than half of all children with disabilities who were living in the U.S. at that time (United States Department of Education, 2007).

To achieve the national goals for access to education for all children with disabilities, several special issues and special populations required federal attention. Key amendments to the law in the 1990s reflected national concerns. The 1990 reauthorization changed the law's name from EHA to the Individuals with Disabilities Education Act, or IDEA. Additionally, Congress mandated that as a part of a student's individualized education program (IEP), an individual transition plan (ITP) must be developed to help the student transition to post-secondary life.

The 1990s saw a push to expand the opportunities for educating children with disabilities in the least restrictive environment. Public Law 105-17 reauthorization articulated a new challenge to improve results for children with disabilities and their families. This included an emphasis on access to the general curriculum (United States Department of Education, 2007). The provisions of the new IDEA Act underscore that special education is comprised of modifications and services which must be provided to the child, if necessary, throughout the child's school day in the regular education classroom, rather than a discreet place the child goes to for special education (special day class or resource room) separate from the child's general education program. (Individuals with Disabilities Education Act Amendments of 1997: Summary of changes. (1997). Washington, D.C.: Disabilities Rights Education and Defense Fund, Inc.).

In 2004, the IDEA reauthorization aligned the IDEA with the No Child Left Behind Act requirements. The 2004 reauthorization called for: 1) Early intervening services for children not currently identified as needing special education but who need additional academic and behavioral support to succeed in a general education environment 2) Greater accountability and improved educational outcomes, and 3) Raised standards for instructors

who teach special education classes (United States Department of Education, 2007).

Academic Performance and Outcomes of Students with EBD

Although many students with disabilities are identified due to intellectual or cognitive factors; that is not a criterion for the category of emotional disturbance. The U.S. Department of Education defines Emotional Disturbance (ED):

(i) Emotional disturbance means a condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree that adversely affects a child's educational performance:

(A) An inability to learn that cannot be explained by intellectual, sensory, or health factors.

(B) An inability to build or maintain satisfactory interpersonal relationships with peers and teachers.

(C) Inappropriate types of behavior or feelings under normal circumstances.

(D) A general pervasive mood of unhappiness or depression.

(E) A tendency to develop physical symptoms or fears associated with personal or school problems.

Students who meet the federal definition of emotional disturbance under the Individuals with Disabilities Education Act (IDEA) experience worse academic outcomes and often lag their peers without disabilities and other groups of students with disabilities despite intellectual ability not being a criterion for the identification.

It is important to note that many professionals and researchers in the field of education refer to students with emotional disturbance as Emotional and Behavioral Disorder (EBD). Emotional and Behavioral Disorders is widely accepted as the professionally preferred term for the emotional disturbance disability category under IDEA within the context of education. Importantly, EBD is not a clinical diagnosis, nor does it represent a clinical condition, EBD is strictly an educational term used to identify students as eligible

for special education and needing specialized support in school to be successful (Jones et al., 2016).

Emotional and behavioral disorders strongly affect students' academic performance. Gunter et al., (2002) suggested that children with EBD are often regarded as more difficult to teach than students with other kinds of problems and are more likely to be (a) mis- or over-identified, (b) recommended for exclusion from general education settings and (c) found to attain marginal or unsatisfactory educational outcomes. Students with EBD have the lowest grade-point averages of students in all disability categories. Almost one-half of students characterized as EBD have GPAs below 1.75 and have failed at least one course in the most recent school year. Most EBD students fail their yearly grade-level competency examinations.

These students are often characterized as having externalizing or internalizing behavior patterns that impede social, behavioral, and/or academic progress (Lane, 2007). Some students with EBD experience pronounced difficulties with problem behaviors, resulting in low academic performance, often after progress has been previously established and documented (Mason & Shriner, 2008). Students with EBD are most likely to have significant academic deficits, often performing 1 to 2 years below grade level (Kauffman, 2001; Nelson, Benner, Lane, & Smith, 2004). Compared to students from other disability groups, students with EBD achieve lower math and reading scores and have higher rates of school failure and grade retention (Reid, Gonzalez, Nordness, Trout, & Epstein, 2004).

Also contributing to the low achievement level is the rate of absenteeism, which is higher than students of any other disability category, at an average of 18 days annually. A complicating factor of this is that because students are kicked out due to their perceived behaviors and don't get access to their general curriculum and even when they aren't kicked out are more likely to be placed in more restrictive settings even within the school setting i.e., self-contained classrooms. Research examining outcomes for students with EBD has indicated that these students receive lower grades, are less likely to pass classes, and expe-

rience higher rates of school dropout than students without disabilities and students with other high incidence disabilities. Students with EBD also have lower rates of graduation than students in any other disability category. The dropout rate is almost double that of general education students (Quinn & McDougal, 1998; Sutherland, 2001).

CHAPTER 2

REVIEW OF LITERATURE

Among students with disabilities, those identified as having an emotional disturbance experience the least favorable outcomes related to academic success. Students with EBD earn lower grades, are less likely to pass classes, and experience higher rates of school dropout than students without disabilities and students with other high incidence disabilities (Wagner & Cameto, 2004). Despite increased attention to the academic needs of students with EBD, their academic achievement, like their behavioral and social skills, does not appear to be improving (Lane et al., 2002). Unfortunately, these poor outcomes do not improve when they leave the school setting. Students with EBD go on to have negative employment outcomes, difficulties with substance abuse, and a high need for mental health services (Bullis & Yovanoff 2006; Walker et al., 2004). Given that between 2% and 20% of the school-age population is likely to have EBD (though many may not be identified as such), this is no small problem. Unlike other disability categories where poor academic achievement can be associated with cognitive disabilities or other sensory or learning differences, students with EBD, by definition, have the cognitive ability to perform the same academically as their peers of the same age but their academic outcomes do not reflect that.

Reid et al 2004.

In 2004 Reid et al. conducted a meta-analysis to address the question: "What is the academic status of students with EBD?" Prior to this synthesis, researchers relied on narrative reviews which presented compelling evidence of the academic deficits experienced by children with EBD but did not provide precise quantitative estimates. The purpose of the Reid et al. study was to use a meta-analytic approach to quantitatively estimate the

difference in academic performance between students with EBD and their same age peers or norm groups. They used a five-step literature search strategy to identify relevant studies published between 1961 and 2000. First, electronic searches of PyschInfo and ERIC were conducted. Second, manual searches of all issues of the Journal of Emotional and Behavioral Disorders and Behavioral Disorders were conducted. Third, ancestral searches of all identified articles were conducted. Fourth, articles previously reported in reviews of the literature were examined. Finally, researchers who had written on the academic status of children with EBD were contacted via email and asked for assistance in locating further articles. This search strategy resulted in a total of 205 articles potentially relevant to the meta-analysis. After applying inclusion criteria and ensuring the independence of the samples this number dropped to 25 studies.

Reid et al. (2004) concluded that EBD students' academic performance lagged that of their peers. Their 25-study database yielded 101 effect sizes. The weighted mean effect size for the sample was -0.6905 (SD =.40), with a range of -3.371 to +0.503. According to Cohen (1988) an effect size of this magnitude denotes a moderate to large difference in the academic performance of students with EBD, compared to that of same age peers without disabilities. The overall achievement level of the EBD group was at the 25th percentile. Students with EBD performed significantly below their peers in all academic subject areas. There was no significant difference in academic performance across placement setting. Although it might be expected that students placed in general education would have higher academic performance, Reid et al. speculated that the lack of difference observed may be due to the variability demonstrated within each setting. Inadequate demographic reporting also limited the researchers' understanding of the academic characteristics of students with EBD. Although more than 2,000 students were represented in the study, it was difficult to assess how representative these students were of the total EBD population. For example, race and gender can be potentially important moderators but the extent to which these data were reported was less than optimal; nearly 30% of studies did not provide information on

the gender of participants and less than half reported on race and ethnicity. The Reid et al. study highlighted several areas in need of future research:

1. The fact that only 25 studies were located that provided academic data indicates that more research aimed at academic achievement among students with EBD is necessary.
2. Given the concerns with overidentification of minorities and increasing identification of girls with EBD, researchers need to provide detailed demographic information and disaggregated data that will allow analysis of subgroups.
3. Researchers have practiced an overreliance on measuring academic performance by age and grade equivalent scores which do not allow for normative comparisons or comparisons across studies.
4. Examining the academic performance within specific skill domains such as reading comprehension and mathematical reasoning would be important to developing a fuller understanding of the academic achievement of students with EBD.

The Current Study

The purpose of this study was:

1. To update and extend the work done by Reid et al., 2004 in using a meta-analytic approach to quantitatively estimate the magnitude of difference in academic achievement between students with EBD and students without EBD.
2. To provide descriptive information that will inform both practice and future research in terms of what is known, and not known, about the academic strengths and needs of students with EBD.

<u>Research Question</u>

1. What is the difference in academic achievement for EBD students and non-EBD students (defined as students without disabilities)?

Differences from Reid et al. (2004)

In completing this systematic review and meta-analysis, several changes were made to both update and extend the meta-analysis by Reid et al. (2004). First, their study looked at only peer reviewed studies between 1961-2001. At the time, peer review (a process by which something proposed is evaluated by a group of experts in the appropriate field) was seen as the gold standard for judging the quality of a study. Since then, research standards and the systematic review process have evolved to include the necessity for searching grey literature (any document not issued by an entity with publishing as its primary source). Examples of grey literature include government documents, industry/NGO reports, think-tank papers, working papers, author manuscripts, dissertations/theses, and conference abstracts/proceedings. Gray literature contains relevant evidence, counteracts publication bias, may be more up to date, and draw more on different information sources. The current study looked at all studies and reports from 2001 (picking up where Reid et al. left off) to 2022. While studies could have been written in a different language and translated into English they had to be originally conducted in the U.S. because different countries have different definitions and procedures for identifying students with EBD. Reid et al. 2004 study included participants who were identified as EBD in one of four ways; (a) identified through the school/IDEA (b) identified through DSM-IV (or prior versions) with conduct disorder or co-occurrence of EBD and another disability (c) psychiatric hospital or university clinic identification or (d) behavior rating scales. The current study focused on students in traditional K-12 public schools receiving special education services under IDEA for emotional/behavior disturbance only. Further, to be included students had no co-occurring disability (i.e., EBD was their sole category of disability eligibility), and were attending a traditional public school where they had access to the general student population and educational curriculum. This is important because according to the most recent data (IDEA Part B Child Count and Educational Environments Collection) (2021) on the educational environments of students with EBD, 85.3% are taught in a traditional public school while

14.7% are taught in non-traditional settings that include correctional, hospital, residential, or separate school settings. It was decided to include students with EBD only and no co-occurring disability because each disability has its own unique characteristics and challenges that come along with it. Also, most students with EBD are of average intelligence and should be able to perform the same academically as their non-EBD peers (behaviors aside). Like Reid et al., the current study had inclusion criteria that studies reported a mean score and standard deviation from a standardized test. A standardized test is a test administered and scored in a standard manner. Standardized tests are designed in such a way that the questions and interpretations are consistent and are administered and scored in a predetermined standard manner. A general distinction is made between tests of ability (intelligence tests) versus tests of achievement (academic proficiency). The following are examples of achievement tests commonly administered across the United States: Kaufman Test of Educational Achievement (KTEA), Peabody Individual Achievement Test (PIAT-R), Wechsler Individual Achievement Test (WIAT), Wide Range Achievement Test, 5th Ed. (WRAT-5), and the Woodcock-Johnson Tests of Achievement (WJ). State achievement tests are also standardized tests and may be required in U.S. public schools for the schools to receive federal funding, according to the US Public Law 107-110 currently authorized as Every Student Succeeds Act in 2015. Most standardized tests have published norm referenced scores which are used to compare individual performance to the performance of a normative sample; for national tests the normative sample would be representative of the nation (to the extent possible), for state tests the normative sample would be representative of that state. It was important to update this work done by Reid et al. because the landscape of education has drastically changed from then to now. Reid et al. looked at studies from 1961 to 2000 which is to say that a large chunk of the studies came at a time when most children with disabilities were denied access to education and opportunities to learn. Public Law 94-142, also known as the Education for All Handicapped Children Act (EHA) which was later reauthorized in 1990 and changed to the Individuals with Disabilities Act (IDEA), was

passed in 1975 to support states and localities in protecting rights of, meeting the individual needs of, and improving the results for infants, toddlers, children, and youth with disabilities and their families. Before the passage of EHA U.S. schools were educating about one in five children with disabilities and many states had laws outright excluding children who were blind, deaf, emotionally disturbed, or who had an intellectual disability. This would also explain why Reid et al. only found 25 eligible studies; 1961-1975 most children with disabilities weren't even allowed in schools, 1975-2000 progress and changes were being made but this wasn't an overnight process. Since 2000 additional acts have been passed to improve education not only for students with disabilities but for all students. (No Child Left Behind Act and Every Student Succeeds Act) There has also been a push for more inclusive education (LRE) and within the EBD context a pendulum has been swinging from being exclusionary and punitive to trying to be inclusive and proactive (i.e., PBIS, SEL, Trauma Informed Care). In the last 20 years there has been a lot of focus on the behaviors with the same old argument: what comes first…behavior or academics? It's important to see if the focus on behaviors has been beneficial (students with EBD have similar academic achievement as students without) again pointing out that these students are of average intelligence and should be performing the same as their peers.

The aim of this research was to apply a meta-analytic method to accurately measure the extent of the academic achievement gap between students with emotional and behavioral disorders and their non-EBD peers or normative groups. By utilizing meta-analysis, it becomes possible to conduct both normative and cross-study comparisons. Additionally, the implementation of meta-analysis aligns with the American Psychological Association's standards that advocate for the use of effect sizes to evaluate the practical significance of differences rather than solely relying on statistical significance.

CHAPTER 3

METHOD

Literature Search

The relevant published and unpublished literature was searched in Education Full Text, ERIC, and PsycInfo from January 2001 to September 2022 to gather all studies that included a standardized test of achievement and a sample of students with EBD. The literature search strategy was developed with a professional research librarian and pilot tested. Concept blocks were used to find terms designed to pick up on a sample of EBD students, content area, and academic achievement. This process resulted in the following search strategy:

1. TI(ebd) OR AB(ebd) OR KW(ebd)
2. TI((emotion*) N5 (conduct OR behavior* OR behaviour* OR disturb* OR disorder* OR handicap* OR disabilit* OR impair* OR serious OR severe OR problem*)) OR AB((emotion*) N5 (conduct OR behavior* OR behaviour* OR disturb* OR disorder* OR handicap* OR disabilit* OR impair* OR serious OR severe OR problem*)) OR KW((emotion*) N5 KW(conduct OR behavior* OR behaviour* OR disturb* OR disorder* OR handicap* OR disabilit* OR impair* OR serious OR severe OR problem*)) OR DE("Emotional and Behavioral Disorders")
3. 1 OR 2

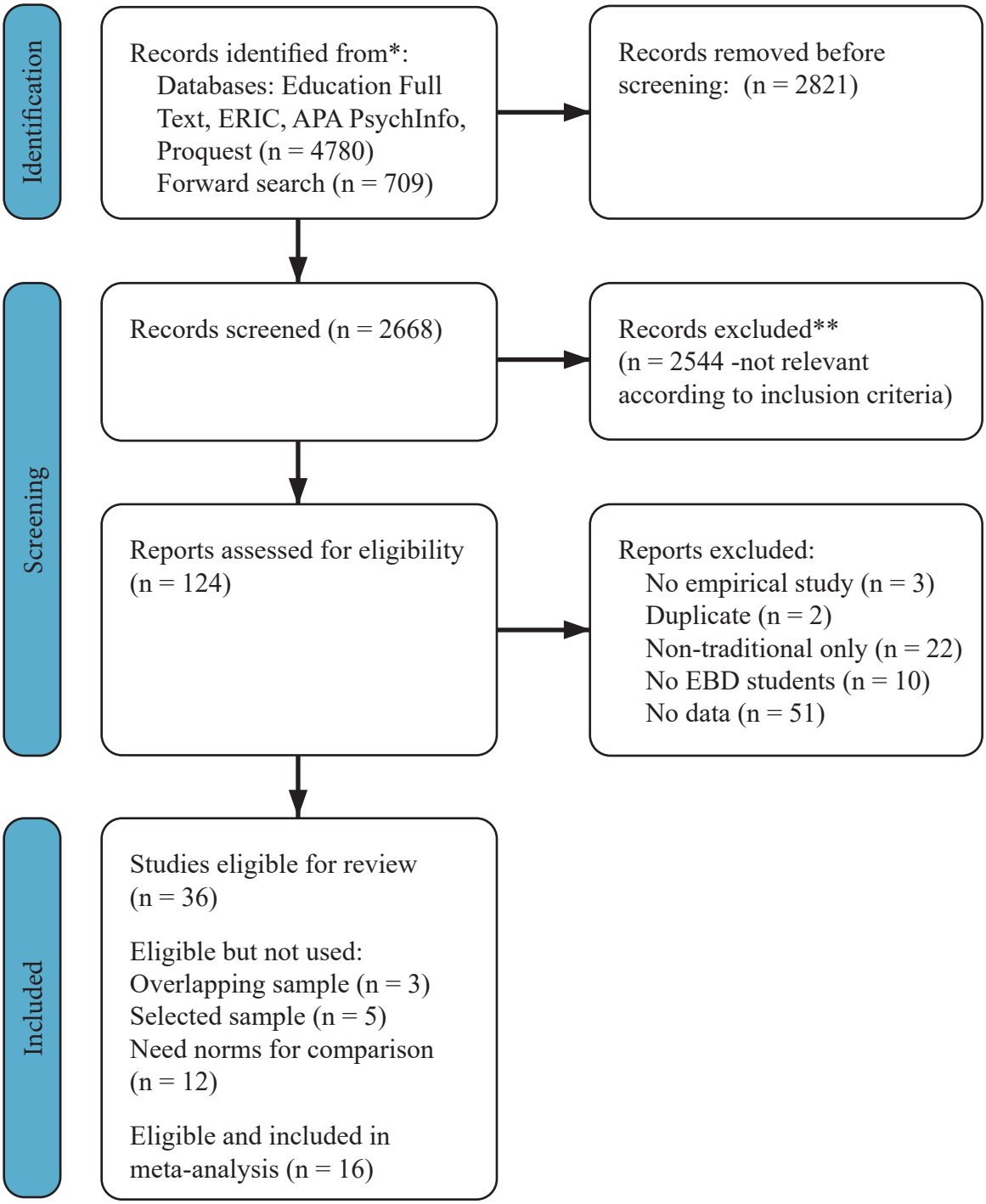
4. TI((academic* OR reading OR math* OR arithmetic OR "written expression" OR literacy OR "language arts" OR writing OR science OR "social studies") N8 (achievement* OR perform* OR status OR outcome* OR functioning)) OR AB((academic* OR reading OR math* OR arithmetic OR "written expression" OR literacy OR "language arts" OR writing OR science OR "social studies") N8 (achievement* OR perform* OR status OR outcome* OR functioning)) OR KW((academic* OR reading OR math* OR arithmetic OR "written expression" OR literacy OR "language arts" OR writing OR science OR "social studies") N8 (achievement* OR perform* OR status OR outcome* OR functioning)) OR DE("Academic Achievement" OR "Academic Overachievement" OR "Academic Underachievement" OR "Achievement Gap" OR "Mathematics Achievement" OR "Reading Achievement" OR "Science Achievement")
5. TI("standardized test*" OR "test scor*") OR AB("standardized test*" OR "test scor*") OR KW("standardized test*" OR "test scor*")
6. 4 OR 5
7. 3 AND 6
8. Limit: years 01/01/2001-12/31/2022

A forward citation search using Google Scholar was performed on the Reid et al. (2004) meta-analysis. Emails were sent to subject experts (Campbell, Cook, Common, Ennis, Gage, Haydon, Hunter, Landrum, Lane, Sallese, and Taylor) to access relevant data not accessible by other means. Federal and state reports, national surveys and longitudinal studies were also examined for relevancy to this synthesis. Results of the search were stored and organized in citation management software (Endnote) and in a Google spreadsheet. The initial search for eligible studies was done by the researcher. After removal of duplicates, non-U.S. based papers, and studies from irrelevant subject areas (such as alternative education or at-risk students, based on descriptors or journal titles), titles and

abstracts were double screened by (a) meta-analysis professor (b) three trained doctoral students (c) the researcher. The interrater reliability (IRR) for the selection phase was 83.8%. Disagreements were reconciled via discussion.

Figure 1

Flowchart of the studies included in the meta-analysis.



Inclusion and Exclusion Criteria

To be eligible for review, documents had to (a) report on an empirical study, (b) be conducted in the United States, (c) in a traditional Kindergarten through 12th grade public school (defined as schools that are free to attend, open to all students, operated by school districts, and funded by taxpayers), with (d) students as the data source. In addition, to be eligible studies must have assessed students using a widely recognized measure of academic achievement (standardized tests such as the Woodcock Johnson and state exams were eligible).

Assessing Potentially Relevant Documents for Eligibility

The titles and abstracts of studies identified as potentially relevant from the literature searches were read for eligibility. Documents were screened out if they were not empirical studies, if they were not conducted in the United States, if they were not conducted in a traditional K-12 public school setting, or if there did not appear to be EBD students in the sample. For studies that appeared to be eligible after examining their titles and abstracts, the full text of the articles was retrieved and further evaluated to ensure the inclusion criteria were met. Researchers ensured that the sample included at least one EBD student (studies that combined EBD and "at risk" students were excluded), the study addressed at least one eligible content area, and that the study provided results from a state or well-known standardized test (student grades, teacher tests, and tests that were not well-known were excluded).

Critical Appraisal of Studies

For this research question the primary study differences affecting study credibility were related to measurement and sampling. Possible issues related to measurement were addressed on the front end by including studies that used socially valid measures (standardized tests and state-mandated exams). While not perfect, these measures are well recognized and have a long history of use in the field. To address issues related to sampling,

researchers described EBD and non-EBD students (defined as students without disabilities) very carefully along several different dimensions (race/ethnicity, gender, age, FRL status, ELL status, etc.) using the coding manual and paid close attention to the possibility of having a selected sample coming from a convenience sample (that is, a convenience sample within a convenience sample).

Data Extraction & Coding

During the pilot testing phase, a coding form was created to extract information that would support contextual description of the studies included in the review and allow for the identification of characteristics that could potentially moderate study outcomes. Trained coders independently coded information about the global context of the school/district/state in which the study was conducted, the local context of the school(s) or classes that participated in the study, the characteristics of the sample, the characteristics of the academic achievement measure(s), and information needed to compute an effect size describing the academic achievement of the students in the sample. Disagreements between coders were resolved via discussion and resulted in updating the coding form with greater detail. The coding form is provided in appendix A. All remaining studies were coded by two researchers working independently and all discrepancies were resolved via discussion. Researchers did not attempt to obtain missing descriptive information; however, one author was contacted to clarify the sample size used in the study.

Meta-Analysis

Overall effect sizes for academic achievement across various content areas for EBD and non-EBD students were computed using inverse-variance weighted meta-analysis. Due to the likelihood that study characteristics across these studies varied in known and unknown ways, a random effects model was used.

Three types of studies emerged in this review. All studies provided the mean and standard deviation for EBD students on an acceptable measure of academic achievement.

Some studies reported the mean and standard deviation on an acceptable measure of academic performance for non-EBD students. When data on both EBD and non-EBD students was available, Cohen's d was used as the effect size (the difference in means between the two groups divided by their common standard deviation), and the standard error for this effect size was defined conventionally (Borenstein et al., 2009).

More common were studies that did not report the academic achievement of non-EBD students. For state tests, researchers looked for the population mean and standard deviation for the year that the test was given. For standardized tests, researchers looked for the mean and standard deviation of the norming sample. Both cases were treated as population data. Then, the numerator of the effect size was formed by using the difference between the EBD group mean and either the norming sample's mean or the state mean for that year depending on the test. The denominator was formed by using the norming sample's standard deviation or the state test's standard deviation. As suggested by Betsy Becker (cited in Koenig, Eagly, Mitchell, & Ristikari, 2011, p.630), the standard error for this effect size was defined as:

$$se_i = \sqrt{\frac{1}{n_i} + \frac{d_i^2}{2 \times n_i \times (n_i - 1)}}$$

where n_i is the sample size for the EBD group and di is the single group effect size defined above.

The final type of study provided information about the academic achievement of EBD students using a sample that was selected out of a convenience sample. For example, some studies selected EBD students for intervention from a larger sample of EBD students in a classroom and reported on the academic performance of these students. Due to the likelihood that these students were performing worse academically that their other EBD peers, researchers chose to exclude these studies in the meta-analysis.

Statistical Independence

Most studies provided more than one eligible estimate of the academic achievement of EBD students relative to non-EBD students. For the overall meta-analysis, researchers used the "aggregate" function in the R Statistical Software (v4.1.2; R Core Team 2021) via the metafor R package (Viechtbauer, 2010) to arrive at a single effect size per study. When the sample sizes are equal across the multiple measures in a study, the resulting aggregated effect size is an average of the multiple effect sizes (otherwise, it is a weighted average). The standard error of the aggregated effect size is smaller than any of the underlying standard errors, reflecting the fact that multiple imperfectly correlated measures of the same construct have been used to measure the same construct.

In addition, because samples are often reported across more than one study, each study was reviewed to ensure no overlap in samples across different studies and given a unique identifier. Reports based on the full sample were preferred over reports based on a portion of the full sample; functionally the latter were treated as duplicates. For one study, (Curran et al., 2021), a reasonable non-EBD sample size for the state during the study year was researched and used for the meta-analysis.

Test of Homogeneity

To determine whether the whole sample of effect sizes were homogenous, meaning a sample whose units (e.g., people, cases, etc.) share the same or very similar characteristics or traits, the homogeneity statistic QT was calculated. A significant QT would indicate that the effect sizes are not homogenous across all the studies. This finding would suggest that the overall sample of effect sizes could be partitioned into smaller groups according to a priori categorical dimensions. Afterwards, an omnibus between-class fit statistic (QB) and an omnibus within-class statistic (QW) was applied to the groupings.

Moderator Analysis

Hedges and Olkin's (1985) categorical fixed-effects model was used to evaluate

which study characteristics, if any, were moderators of effect sizes. Using this approach, a priori variables were selected that could be significant moderators of effect sizes and these studies were grouped together (Durlak & Wells, 1998). A regression model was used to determine if the moderator variables (percentage of minority participants and percentage of participants assigned female at birth) explain a significant amount of variance in each analysis. Categorical moderator variables (placement setting and content area) were examined using an analysis of group comparisons.

Publication Bias

Publication bias refers to the tendency for statistically significant findings or large effect sizes to be published leading to selection bias that can inflate results. Despite attempts in the current analysis to obtain unpublished literature, it is important to assess if bias might exist and if so to what extent. A funnel plot was used to detect the presence of publication bias in each analysis by graphically displaying the symmetry of included studies (illustrating the relationship between effect size and sample size). Larger studies, depicted on top, are expected to have less sampling error, greater accuracy, and more symmetry. The resulting image is an inverted funnel, with smaller studies that have a wider array of effect sizes on the bottom. A trim and fill procedure (Taylor & Tweedie, 2000) was used to remove the most extreme studies until symmetry was attained, and then replace these studies along with their mirror images. A corrected effect size was then calculated based on the symmetrical funnel that includes estimated results of missing studies. Since this procedure could be thrown off by a few atypical studies, it is important to have enough studies to compensate for this effect. To address publication bias within this meta-analysis all studies were combined and used to calculate publication bias regardless of content area.

CHAPTER 4

RESULTS

Of the 28 eligible studies, 12 were not included because no information on a norming sample was available. Another five studies met the inclusion criteria for the meta-analysis but were not included due to the selected nature of the sample. Three studies contained samples that overlapped with other studies but were dropped because another study used a more complete sample. This meta-analysis was therefore based on 86 effect sizes from 16 studies describing the difference in academic achievement of EBD and non-EBD students. A study-level forest plot with these 16 studies is available in figure 2. The meta-analysis revealed the expected significant difference between the academic achievement of EBD and non-EBD groups. This difference was large, $d = -.86$, $p < .0001$. The homogeneity test was statistically significant, ($QT = 887.3$, $p < .0001$).

The prediction interval was extremely wide (ranging from -1.60 to -0.14) indicating substantial true heterogeneity in the effect size estimates. A trim and fill analysis suggested that publication bias did not play a role in estimated mean effect size (see the funnel plot in figure 3).

Figure 2

Forest Plot of the studies included in the meta-analysis.

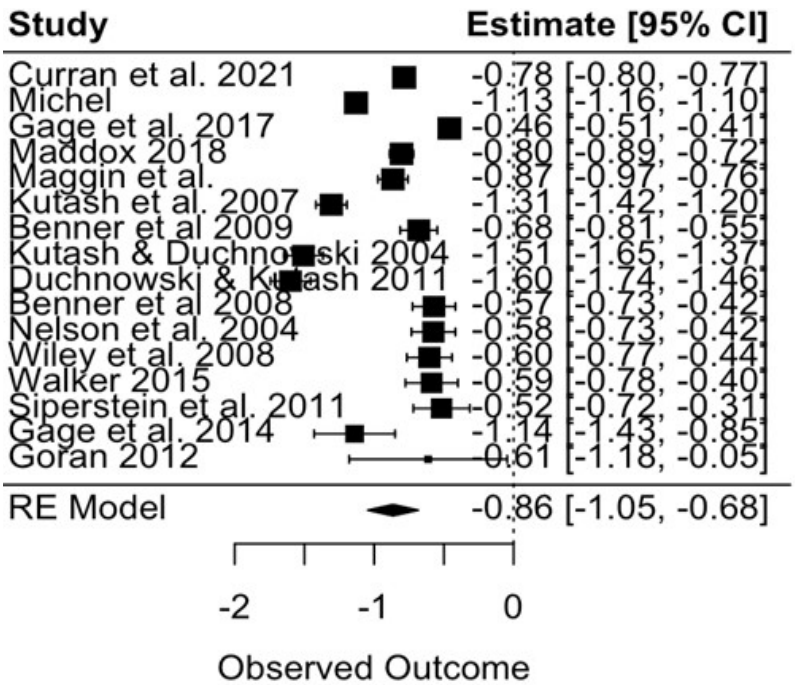
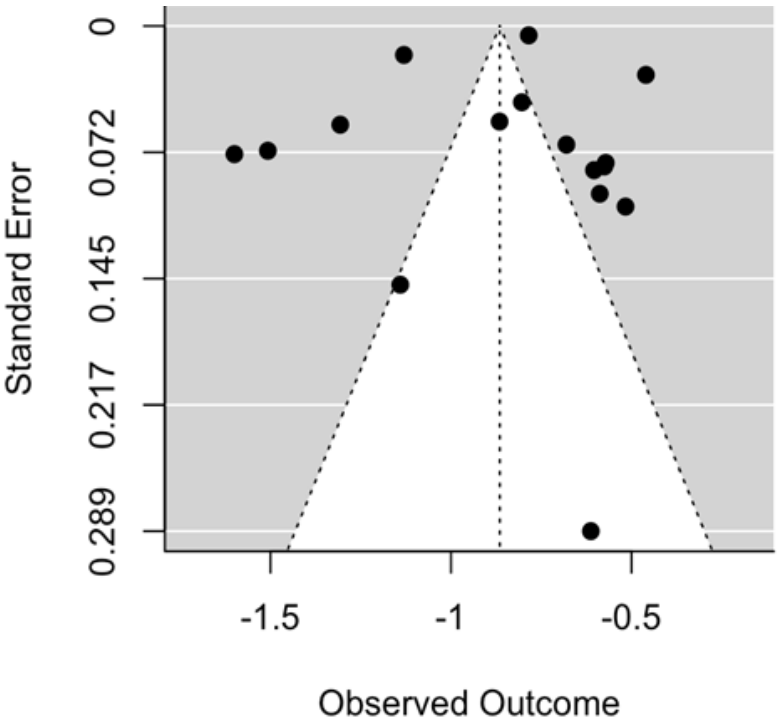


Figure 3

Funnel Plot of the studies included in the meta-analysis.



A “leave one out” analysis was conducted in which 16 meta-analyses were ran, dropping one each time and then looking at the range (-.89 to -.82) of the smallest and largest effect to see if any studies were overly influential. The analysis suggested that there were no overly influential studies.

To examine whether the academic performance of EBD relative to non-EBD students varies as a function of academic content area, researchers conducted a moderator analysis using the two most plentiful content areas in the dataset: math and reading/literacy. Twelve studies, with 32 effect sizes, assessed the academic performance of EBD students in math. As before, the researcher aggregated these effect sizes within independent samples to arrive at a single effect size per study and then conducted random effects meta-analysis. The effect size in studies assessing student performance in math was d = -0.93, with a 95% confidence interval ranging from -1.20 to -0.65. Twelve studies, with 38 effect sizes, assessed the academic performance of EBD students in reading/literacy. The effect size in studies assessing student performance in reading/literacy was d = -0.86, with a 95% confidence interval ranging from -1.03 to -0.68. The difference between the effect size for math and the effect size for reading/literacy was not statistically significant, z = .68.

CHAPTER 5

DISCUSSION

The purpose of this examination was to update and extend the work done by Reid et al. (2004) to quantitatively synthesize the research on the academic achievement of students with EBD and to determine the magnitude of difference in achievement when compared to non-EBD students; defined as students without disabilities.

Participant Characteristics

Thorough reporting of characteristics of samples has been noted as a problem in previous reviews (e.g., Mooney et al., 2003; Trout et al., 2003) including Reid et al. (2004). Although thousands of students were represented in this study, it is difficult to assess how representative these students were of the total EBD population. While states must meet federal guidelines for identifying and referring students under IDEA, they in fact use different language in both their definitions of EBD, and in describing their identification processes (e.g., Sallese et al., 2023). While states must meet federal guidelines to meet this definition each state has their own definition of emotional disturbance which leads to different interpretations of identification and referral of students with EBD. Race/ethnicity, gender, socioeconomic status, and more recently English Language Learners, could be potentially important moderators; however, the extent to which these data were reported was less than optimal. As a result, researchers could not assess whether these were significant moderators of achievement. Another problem lies in the nature of the EBD groups sampled. Several studies reported convenience samples thus researchers couldn't be certain to what extent the students included in the analysis were representative of the current EBD population.

Overall Achievement

The findings demonstrate that there is a large (d = -.87) difference in the academic achievement of students with EBD compared to non-EBD students. This is consistent with what Reid et al found in 2004 along with other previous research (Landrum et al., 2003; Lane et al., 2006; Lewis et al., 2017; Mihalas et al., 2009; Moore et al., 2017; Olivier et al., 2018; Ysseldyke et al., 2017) which has noted persistent problems with low academic achievement.

Limitations

Despite an exhaustive literature search only 16 studies met inclusion criteria for the meta-analysis. Given the small number of studies, several caveats common to meta-analytic studies should be considered when interpreting the results. First, the effect sizes were very heterogeneous as suggested by the wide prediction interval, and additional follow up moderator tests did not explain this heterogeneity. Next, the participants included were highly heterogeneous due to such factors as variation in definitions of EBD across states, age, academic assessment used, and the content area that was assessed. This likely served to increase variance across studies. Lastly, the studies reported were cross-sectional snapshots of academic achievement. This study didn't address within-student changes over time.

Implications

The findings from this study suggest that students with EBD need additional effective academic instruction. From a policy perspective, the findings from this study emphasize the need for policies to be enforced rather than just encouraged. While IDEA has been reauthorized and amended to address issues around academic achievement there is too much room for interpretations by states which could be cause for the academic outcomes observed in this study. From a practitioner's perspective, the findings from this study emphasize the need for teachers to continue to monitor and measure the academic achieve-

ment of students with EBD. This also highlights the need for teachers to use evidenced based academic interventions that address deficits across all academic content areas. From a research perspective, these findings emphasize the need for additional research to examine causal factors related to academic underachievement, academic achievement within specific subject areas, and the long-term effects of underachievement. Reporting standards for participants should be improved, to allow for analysis of important moderator variables.

Future Research

The findings from this meta-analysis highlight several areas in need of future research. First, despite an exhaustive literature search researchers were only able to locate 16 studies that provided academic data. In the past, researchers have practiced an overreliance on measuring academic achievement and performance by using age and grade equivalent scores. Although, they may be easier to interpret, they do not allow for normative comparisons or comparisons across studies. While standardized tests are not perfect, they may reduce the likelihood of subjectiveness and bias that can be present in grades given by teachers and teacher-made tests. Second, there needs to be research on students with EBD alone without combining "at-risk" students and EBD students together. The definition of EBD varies widely from state to state as it is and when combined with "at-risk" it is hard to speak to the sample and how representative it is or how it generalizes to a larger sample. Being labeled "at-risk" leaves a lot of room for interpretation not just for researchers but for practitioners and other stakeholders. Third, more research is needed to compare the academic achievement of EBD students on national standardized tests to state tests. Most states have high stakes exams that are tied to funding and practitioner's feel pressure to ensure their students are performing successfully on these exams. It would be interesting to compare results and see if practitioners are preparing their students better for state exams vs national exams. Fourth, research is needed to examine the relationship between having highly qualified and trained educators and whether that has a positive effect on the academ-

ic achievement of students with EBD. Fifth, exploration and comparison of the academic achievement between EBD students educated in traditional schools versus nontraditional schools would tell us more about the least restrictive environment and whether that matter. Sixth, research is needed to examine the use of PBIS, and other behavior supports that are in place to help students with EBD be successful. The point of having those supports in place is to effectively manage behaviors so that students can receive academic instruction. There has been a lot of focus on how to address this population's challenging behaviors- if these strategies were effective then why are EBD students still lagging their peers without disabilities and their peers who have other disabilities, despite intellectual ability not being a factor. Finally, inadequate demographic reporting limited researchers understanding of the academic characteristics of students with EBD. Given the overidentification and over-representation of minority groups, particularly Black students, the increasing identification of girls with EBD, and the emerging research on ELL students with EBD, researchers need to provide detailed demographic information and disaggregated data that will allow analysis of subgroups. The findings from this study suggest that students with EBD need additional effective academic instruction across all subject areas.

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LIST OF APPENDICES

DANA'S DISSERTATION EBD MA

Introduction

Coder: Coder Name (Please use initials only e.g. DP)

Study ID: Use the number in the "study_id" column from the retrieval spreadsheet

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Study Year: What year was the study published?

Study Author: Enter the name(s) of the author(s). (One author Page, D) (Two authors Page, D. and Valentine, J.C.) (Three or more authors Page et al.)

Eligibility and Inclusion Screening

USA: Was the study conducted in the United States?

- ☐ Yes (1)
- ☐ No (2)

Traditional: Does this study contain any data from a traditional public school? If the study contains data from a non traditional setting only then choose no. If the study contains data from both a traditional public school setting and non-traditional public school setting then choose yes. Non-traditional public school settings are defined as charter, private, alternative, special, clinic, residential, day treatment, self contained special education schools etc. *Note self contained classrooms within traditional public schools are acceptable.

- ☐ Yes (1)
- ☐ No (2)

EBD Students: Is there a sample of students identified with emotional/behavioral disorders included in the study? (The label may be different such as severe emotional disturbance, emotional disturbance/disorder, behavior disability/disorder; as long as they are formally IDEA identified and not "at risk")

- ☐ Yes (1)
- ☐ No (2)

Contains Data: Does the study contain data from a national / state standardized assessment with a mean and standard deviation? For example, some studies only contain data such as 30% students scored in the "passing" category or 30% scored proficient in math and I can't do anything with that.

- ☐ Yes (1)
- ☐ No (2)

State / District / School Level Information

Larger Study: Was the data included and reported in this study part of a larger study i.e. a national longitudinal study? If yes, enter the name of the study in the text box.

- ☐ Yes (1)
- ☐ No (2)

State / District / School: How many states/districts/schools were represented in this study? Enter the name of the state / district / school if reported.

- ☐ State level (1)
- ☐ District level (2)
- ☐ School level (3)
- ☐ Other (5) _____

Area Designation: What is the area designation of the state/district/school in this study?

- ☐ Urban (1)
- ☐ Suburban (2)
- ☐ Rural (3)
- ☐ Other (4) _____
- ☐ Not reported (5)

Geographic Location: What is the state / district / schools' geographic location?

- ☐ North (1)
- ☐ South (2)
- ☐ East (3)

- [ ] West (4)
- [ ] Northeast (5)
- [ ] Northwest (6)
- [ ] Southeast (7)
- [ ] Southwest (8)
- [ ] Midwest (9)
- [ ] Other (10) _____
- [ ] Not reported (11)

School Classification: If applicable, what is the schools' classification based on grade levels taught?

- [ ] Elementary/Primary (Grades K-5) (1)
- [ ] Middle/Secondary (Grades 6-8) (2)
- [ ] High School/Secondary (Grades 9-12) (3)
- [ ] Other (4) _____
- [ ] Not Reported (5)

Student Enrollment: What is the state / district / schools' student enrollment (i.e., average size of state / district / school) included in the study?

- [ ] less than 100 (1)
- [ ] 100-200 (2)
- [ ] 200-300 (3)
- [ ] 300-400 (4)
- [ ] 400-500 (5)
- [ ] 500-600 (6)
- [ ] 600-700 (7)
- [ ] 700-800 (8)
- [ ] 800-900 (9)
- [ ] 900-1,000 (10)
- [ ] 1,000-5,000 (11)
- [ ] 5,000-10,000 (12)
- [ ] 10,000+ (13)
- [ ] Other (14) _____
- [ ] Not Reported (15)

State / Ethnic What is the state/district/schools' ethnic demographic (%)?

- [ ] Hispanic (1)
- [ ] Non Hispanic (2)
- [ ] Not reported (3)

State / Race: What is the state/district/schools' racial demographic (%)? Specify the language used to describe students (i.e., Black, 45%, Caucasian, 30%). When you quote the article, please be sure to enclose the relevant text in quotation marks and include the page number.

- ☐ White or Caucasian (1)
- ☐ Black or African American (2)
- ☐ American Indian or Alaska Native (3)
- ☐ Latinx or Hispanic (4)
- ☐ Pacific Islander or Native Hawaiian (5)
- ☐ Bi-racial/Multiracial (6)
- ☐ Other (7) _____
- ☐ Not reported (8)

Gender: What percentage of the students in the state / district / school were identified as boys or girls?

- ☐ Boys (1)
- ☐ Girls (2)
- ☐ Other (3) _____
- ☐ Not reported (4)

FRL: What percentage of students in the state / district / school qualified for free / reduced lunch?

- ☐ Free/reduced lunch (1)
- ☐ Other (2) _____
- ☐ Not reported (3)

Title 1: Was the state / district / school identified as being Title 1? If the study doesn't explicitly say it then choose no.

- ☐ Yes (1)
- ☐ No (2)

SpEd: What percentage of students in the state / district / school were identified as receiving special education services?

- ☐ Receiving special education (1)
- ☐ Other (2) _____
- ☐ Not reported (3)

ELL: What percentage of students in the state / district / school were identified as English Language Learners?

- [ ] ELL (3)
- [ ] Other (4) _____
- [ ] Not reported (5)

Notes: Add any special notes about the state/district/school here. Use NA if there are no additional notes.

Sample Level Information

Sample ID: Sample ID

Use the sample ID to distinguish between independent samples within the same study. For example, if the study authors provide separate effect sizes for girls and boys, or for EBD and non-EBD participants, they constitute unique samples. Use this format: study id underscore sample id, e.g., if the study id = 42, use 42_1 for the first independent sample, 42_2 for the second, and so on. Also, it will be helpful if you code the independent samples in the order of presentation of the separate effect sizes, so if the authors present EBD and non-EBD separately, and in that order, use 1 for the EBD sample and 2 for the non-EBD sample.

Selected Sample: Was the EBD sample a selected sample of the convenience sample? (For example: some studies selected "the 3 EBD students with the most severe behaviors of all the EBD students" making this a selected sample within a larger convenience sample) If it is not explicitly stated choose no.

- [ ] Yes (1)
- [ ] No (2)

EBD Retained: Have any EBD students been retained? If yes, include the total number of students. (Use the authors language from the study i.e.held back, repeated a grade, etc) If you quote the article, please be sure to enclose the relevant text in quotation marks and include the page number. If it is not explicitly stated choose no.

- [ ] Yes (1)
- [ ] No (2)

Placement Sample: Educational Placement Setting

Enter the total number of EBD students in each setting where the study was conducted.

- [ ] self contained classroom (most restrictive) (1)

- [ ] resource room (medium restrictive) (2)
- [ ] general education classroom (least restrictive) (3)
- [ ] Other (4) _____
- [ ] Not reported (5)

EBD Demographics: If any demographics (ethnicity/race, gender, age, FRL) are reported for the EBD participants in this sample, please record that here. When you quote the article, please be sure to enclose the relevant text in quotation marks and include the page number. Enter NR if not reported.

Sample Ethnicity: Sample Ethnicity

What is the sample ethnic demographic (%)?

- [ ] Hispanic (1)
- [ ] Non Hispanic (2)
- [ ] Not reported (3)

Sample Race: Sample Race

What is the sample racial demographic (%)? If you choose "Other" please quote from the paper. If you quote the article, please be sure to enclose the relevant text in quotation marks and include the page number.

- [ ] White or Caucasian (1)
- [ ] Black or African American (2)
- [ ] American Indian or Alaska Native (3)
- [ ] Latinx or Hispanic (4)
- [ ] Pacific Islander or Native Hawaiian (5)
- [ ] Bi-racial / Multiracial (6)
- [ ] Other (7) _____
- [ ] Not reported (8)

Sample Gender: Sample Gender

Enter the percentage (%) of students identified as boys or girls. Use the language the author uses. When you quote the article, please be sure to enclose the relevant text in quotation marks and include the page number.

- [ ] Boys (1)
- [ ] Girls (2)
- [ ] Other (3) _____

☐ Not reported (4)

Sample Age Sample Age (Mean or Median)

Enter the sample mean age (median is fine too). Enter NR if not reported.

Sample Age: SD Sample Age (Standard Deviation)

Enter the sample age standard deviation. Enter NR if not reported.

Sample SpEd: What percentage of sample participants were identified as receiving special education services? Enter NR if not reported.

Sample FRL: What percentage of sample participants qualified for free / reduced lunch? Enter NR if not reported.

Sample ELL: What percentage of sample participants were identified as being English Language Learners? Enter NR if not reported.

Notes: Add any additional notes here. Enter NA if not applicable.

Measure 1.1

Content Area What was the academic content area assessed?

☐ reading/literacy (1)
☐ written expression (2)
☐ math (3)
☐ science (4)
☐ social studies (5)
☐ Other (6) _____

Test: Measure of Academic Achievement

Indicate the standardized assessment used to measure academic achievement.

- [ ] Kaufman Test of Educational Achievement (KTEA) (1)
- [ ] Peabody Individual Achievement Test (PIAT) (2)
- [ ] Woodcock Johnson (WJ) (3)
- [ ] Wide Range Achievement Test (WRAT) (4)
- [ ] Weschler Adult Intelligence Scale (WAIS) (5)
- [ ] National Assessment of Educational Progress (NAEP) (6)
- [ ] Measure of Academic Progress (MAP) (7)
- [ ] Other (8) _____

Modifications: Modifications

Describe any modifications made by the study authors to this measure (e.g., if they dropped items, if this is a translated version, etc.). Enter NA if not applicable.

EBD Sample Size: Enter the number of EBD participants.

EBD Mean: What mean was reported for the EBD sample for the academic measure?

EBD SD: What standard deviation was reported for the EBD sample for the academic measure?

Non-EBD? Does this study include a sample of non-EBD students that you want to record data for?

- [ ] Yes (1)
- [ ] No (2)

Non-EBD Sample Size: Enter the number of non-EBD participants.

Non-EBD Mean: What mean was reported for the non-EBD sample for the academic measure?

Non-EBD SD: What standard deviation was reported for the non-EBD sample for the academic measure?

Notes: Enter any additional notes. Enter NA if not applicable.

More Data? Is this the last academic measure you need to enter?

No, I have more measures to enter. (1)

Yes, I have finished coding this study. (2)

Measure 1.2

Content Area: What was the academic content area assessed?

- ☐ reading / literacy (1)
- ☐ written expression (2)
- ☐ math (3)
- ☐ science (4)
- ☐ social studies (5)
- ☐ Other (6) _____

Test Measure of Academic Achievement

Indicate the standardized assessment used to measure academic achievement.

- ☐ Kaufman Test of Educational Achievement (KTEA) (1)
- ☐ Peabody Individual Achievement Test (PIAT) (2)
- ☐ Woodcock Johnson (WJ) (3)
- ☐ Wide Range Achievement Test (WRAT) (4)
- ☐ Weschler Adult Intelligence Scale (WAIS) (5)
- ☐ National Assessment of Educational Progress (NAEP) (6)
- ☐ Measure of Academic Progress (MAP) (7)
- ☐ Other (8) _____

Modifications: Modifications

Describe any modifications made by the study authors to this measure (e.g., if they dropped items, if this is a translated version, etc.). Enter NA if not applicable.

EBD Sample Size: Enter the number of EBD participants.

EBD Mean: What mean was reported for the EBD sample for the academic measure?

EBD SD: What standard deviation was reported for the EBD sample for the academic measure?

Non-EBD? Does this study include a sample of non-EBD students that you want to record data for?

- [ ] Yes (1)
- [ ] No (2)

Non-EBD Sample Size: Enter the number of non-EBD participants.

Non-EBD Mean: What mean was reported for the non-EBD sample for the academic measure?

Non-EBD SD: What standard deviation was reported for the non-EBD sample for the academic measure?

Notes: Enter any additional notes. Enter NA if not applicable.

More? Is this the last academic measure you need to enter?

- [ ] No, I have more measures to enter. (1)
- [ ] Yes, I have finished coding this study (2)

Measure 1.3

Content Area: What was the academic content area assessed?

- ☐ reading/literacy (1)
- ☐ written expression (2)
- ☐ math (3)
- ☐ science (4)
- ☐ social studies (5)
- ☐ Other (6) _____

Test Measure of Academic Achievement

Indicate the standardized assessment used to measure academic achievement.

- ☐ Kaufman Test of Educational Achievement (KTEA) (1)
- ☐ Peabody Individual Achievement Test (PIAT) (2)
- ☐ Woodcock Johnson (WJ) (3)
- ☐ Wide Range Achievement Test (WRAT) (4)
- ☐ Weschler Adult Intelligence Scale (WAIS) (5)
- ☐ National Assessment of Educational Progress (NAEP) (6)
- ☐ Measure of Academic Progress (MAP) (7)
- ☐ Other (8) _____

Modifications

Describe any modifications made by the study authors to this measure (e.g., if they dropped items, if this is a translated version, etc.). Enter NA if not applicable.

EBD Sample Size: Enter the number of EBD participants.

EBD Mean: What mean was reported for the EBD sample for the academic measure?

EBD SD: What standard deviation was reported for the EBD sample for the academic measure?

Non-EBD? Does this study include a sample of non-EBD students that you want to record data for?

- [ ] Yes (1)
- [ ] No (2)

Non-EBD Sample Size: Enter the number of non-EBD participants.

Non-EBD Mean: What mean was reported for the non-EBD sample for the academic measure?

Non-EBD SD: What standard deviation was reported for the non-EBD sample for the academic measure?

Notes: Enter any additional notes. Enter NA if not applicable.

More? Is this the last academic measure you need to enter?

- [ ] No, I have more measures to enter. (1)
- [ ] Yes, I have finished coding this study (2)

Appendix B: Studies Included in Analysis Table

Studies Included in Analysis

Study	N	Age+	IQ+	Gender*	Race*	Location	Academic areas assessed	Dependent measures
Allman & Slate (2013)^	3,541	NR	NR	NR	NR	NR	R, Ma	TAKS-A
Benner et al. (2008)	163	11.64 (3.65)	96.71 (15.71)	M=82, F=18	B=12, L=2, NA=2, W=84	Urban	Ma, R, Wr	WJ-III
Benner et al. (2009)	152	11.8 (3.5)	96.7 (15.7)	M=80.9	W=85.5	Urban	Ma, R, Wr	WJ-III
Berry (2012)^	81	NR	NR	M=72, F=28	A=4, B=9, H=5, MR=2, W=65	Rural	Ma, R	CRCT
Chisolm (2015)^	140	NR	NR	NR	NR	Urban	Ma, R, Lang	MAP
Curran et al. (2021)	43,892	NR	NR	NR	NR	Multiple	ELA, Ma	WKCE
Derico (2017)^	19	NR	NR	NR	NR	Urban	ELA, Ma, R	CRCT
Duchnowski & Kutash (2011)	199	12.5 (3.2)	NR	NR	NR	Urban	Ma, R	WRAT-3
Filipowski (2020)^	203	13.67	86.15	M=71, F=29	B=75, H=.5, MR=10, W=15	Urban	R	DIB, PSSA
Flynn (2012)^	8	NR	NR	NR	NR	Urban	Ma, R	NYSELA/M
Fore et al. (2007)^	50	NR	NR	NR	W=92, B=6, O=2	Suburban	Wr, O	CRCT
Gage et al. (2014)	114	NR	NR	M=81, F=19	B=6, H=73, O=6, W=15	NR	R, Wr	CMT

Appendix B: Studies Included in Analysis Table (cont.)

Studies Included in Analysis

Study	N	Age+	IQ+	Gender*	Race*	Location	Academic areas assessed	Dependent measures
Gage et al. (2017)	39,561	10.5, 11.9, 13.8	NR	M=68, F=32	B=12, H=4, W=83	Multiple	Ma, R	WJ-III
Goran (2012)	9	12.2	101.67	M=56, F=44	B=33, W=67	Multiple	Lang,R , Voc	WRMT, CELF, PPV, EVT
Goran & Gage (2011)^	25	8.84	NR	M-60, F=40	B=60, MR=8, W=32	NR	Ma, R, Wr	MiAP
Hood (2015)^	1,435	NR	NR	M=78, F=22	W=78	Multiple	Ma, R	OAKS
Jones (2018)^	83	NR	NR	NR	NR	Urban	Ma, R	PSSA
Kutash & Duchnowski (2014)	158	11.8 (3.2)	79.2 (11.4)	M=85, F=15	B=83, H=6, MR=.6, W=10	Urban	Ma, R	WRAT-III
Kutash et al. (2007)	314	12.5 (3.3)	83.55 (14.22)	M=84, F=16	B=58, H=4, O=4, W=35	Multiple	Ma, R	WRAT-III
Maddox (2018)	420	NR	NR	M=74, F=26	A=1; B=16, H=11, NA=1, MR=1, W=69	Multiple	Ma	WJ-III
Maggin et al. (2011)	268	7.10 (1.49) 8.03 (1.48)	NR	M=75, F=25	B=77, H=4, NR=6, W=13	NR	Ma, R, Wr	WJ-III
Michel (2021)	4,427	NR	NR	M=65, F=35	A=3, B=42, L=42, MR=1, NA=.3, W=12	Urban	ELA, Ma	MCAS
Myers (2009)^	59	NR	NR	NR	NR	Suburban	Hi, Ma, Re, S, Wr	SOL, STAN10
Nelson et al. (2004)	155	NR	NR	M=79, F=21	B=11, H=2, NA=2, W=85	Urban	Ma, R, Wr	WJ-III

Appendix B: Studies Included in Analysis Table (cont.)

Studies Included in Analysis

Study	N	Age+	IQ+	Gender*	Race*	Location	Academic areas assessed	Dependent measures
Siperstein et al. (2011)	61	NR	NR	M=81, F=19	B=15, H=16, O=7, W=62	Multiple	Ma, R	WJ-III
Walker (2015)^	113	NR	NR	NR	NR	Multiple	ELA, Ma	WJ-III, WI-AT-III, MEAP
Wanzek et al. (2014)^	2,146	NR	NR	NR	NR	Multiple	Lang	DIB
Wiley et al. (2008)	140	NR	NR	M=84, F=16	W=59, B=19, H=17, A=2, O=3	Suburban	Ma, R	WJ-III

N - number of participants; + - reported as mean (standard deviation); * - reported as percentages; ^ - study not included in meta-analysis; NR – not reported; M – male; A – Asian/Pacific Islander; B – African American/Black; H – Hispanic; L – Latino; MR – multiracial; NA – Native American/American Indian/ Alaskan Native; O – Other; W – White/Caucasian; ELA – English/Language Arts; Hi – History; Lang – Language; Ma – Math; R – Reading; S – Science; Voc – Vocabulary Wr – Writing; CELF - Clinical Evaluation of Language Fundamentals; CRCT - Georgia Criterion Referenced Competency Test; CMT - Connecticut Mastery Test; DIB - Dynamic Indicators of Basic Early Literacy Oral Reading Fluency; EVT - Expressive Vocabulary Test; MAP - Measure of Academic Progress; MCAS - Massachusetts Comprehensive Assessment System; MiAP - Missouri Assessment Program; NYSELA/M - New York State English Language Arts/Mathematics tests; OAKS - Oregon Assessments of Knowledge and Skills; PSSA - Pennsylvania System of School Assessment; PPV - Peabody Picture Vocabulary Test; SOL – Virginia Standards of Learning tests; STAN10 – Stanford 10 exam; TAKS-A - Texas Assessment of Knowledge and Skills Accommodated; WJ-III – Woodcock Johnson-III; WKCE - Wisconsin Knowledge and Concepts Examination; WRAT3 - Wide Range Achievement Test-3; WRMT - Woodcock Reading Mastery Tests-Revised

CURRICULUM VITAE

Dana Page

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Department of Special Education, Early Childhood & Prevention Science
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SUMMARY

Main research interests and scholarly activities are rooted in using anti racist, culturally relevant, and culturally sustaining practices to address the academic, behavior, and disciplinary disparities of Black students receiving special education services.

EDUCATION

PhD in Curriculum & Instruction in Special Education **May 2023**
University of Louisville, Louisville, KY

MA in Special Education **December 2017**
Georgetown College, Georgetown, KY

BA in Education **May 2010**
Eastern Kentucky University, Richmond, KY

PROFESSIONAL CREDENTIALS

Kentucky Professional Teaching License **June 2017 to Present**
Learning and Behavior Disabilities (P-12)
Safe Crisis Management Certified
Trauma Informed Practices for Educators & School Personnel (TIPE) Certified Trainer

PROFESSIONAL CREDENTIALS

University of Louisville, Louisville, KY **August 2020 to May 2023**
OSEP Doctoral Scholar

- Provided training, technical assistance, and professional development to educators on issues such as writing an IEP, progress monitoring, data collection and analysis, design, and implementation of MTSS, and due process procedures.
- Delivered presentations at regional and national conferences on issues related to special education such as disparities in discipline and how to combat inequities in special education.

- Supervised, trained, and provided technical assistance to educators, related service providers, parents/caregivers on how to implement strategies to address students social, emotional, and behavioral needs.
- Oversaw monitoring visits to check for compliance on corrective action plans; collaborated with administrators and educators on identifying goals and objectives to rectify corrective action plan.
- Organized and reviewed team packets/assignments for the day with the team, assured each member understood tasks, made needed adjustments, and answered any questions.
- Guided the team in debriefing sessions before, during, and after the assessment. Prioritized and came to consensus on report topics based on team findings aligned with areas critical to instructional equity.
- Collected data that informed the process of removing programmatic barriers that impede full participation, access, and opportunity for students to receive an equitable education.
- Assessed the extent to which equity is present in such areas as identification, referral, discipline, student achievement and attainment.

U.S. Department of Education, Washington D.C. **June 2022 to December 2022**
OSEP Research to Practice Intern

- Served as a content area specialist in special education in personnel/professional development; technical assistance, behavior/mental health to support the delivery of special education services and instruction for children with disabilities.
- Working knowledge of the administrative principles, practices, procedures, and techniques used to prepare, solicit, execute, and administer comprehensive grant programs.
- Developed and reviewed plans for education research that use quantitative methods to address significant questions of education science, policy, or practice.
- Provided input into the development of discretionary grant priorities, policies, procedures, and guidance and manages the peer review process of research grant competitions.
- Participated in equity workgroup discussions to address diversity, equity, inclusion, and accessibility.
- Actively engaged in intra/interagency work to ensure children and youth with disabilities are appropriately included within initiatives, priorities, policies, budgets, and guidance.
- Wrote content arising from rigorous research activity to convey study findings to a variety of audiences; engaged in dissemination and outreach activities.

Kentucky Department of Education, Frankfort, KY **June 2022-July 2022**
COVID Research Fellow

- Collected and analyzed data trends on the effects of COVID on learning loss and teacher attrition.
- Conducted literature reviews to assess current and future research needs, used literature to support and analyze conclusions drawn from data.
- Provided technical assistance on how to collect and analyze data for the use of Elementary and Secondary School Emergency Relief (ESSER) spending and reviewed district and state ESSER spending by category.
- Created user friendly platform to disseminate information to community stakeholders.
- Provided feedback to data governance team on the need to disaggregate data to make informed, data driven decisions.

Community Action Council, Lexington, KY **July 2019 to March 2020**

School Readiness Coach

- Coached early childhood and head start classroom teachers on effective strategies to use for instruction and behavior management.
- Assisted in program implementation and curriculum development of Conscious Discipline to address behavior needs of students.
- Delivered educators with data analysis from assessments and diagnostic instruments to develop instructional strategies for supporting students emotional and behavioral needs.
- Supported educators by creating individualized coaching plans based on assessments, observations, and interviews.
- Provided constructive feedback and support to teaching staff for learning and growth; used reflective practice and additional strategies to promote positive outcomes for the teaching staff.
- Planned and presented small group workshops on relevant child development topics based on program monitoring outcomes.

Fayette County Public Schools, Lexington, KY **February 2006 to June 2019**

Special Education Teacher July 2016 to June 2019

- Employed techniques such as behavior modification and positive reinforcement to target specific behaviors and analyzed data to inform next steps in instructional strategies.
- Wrote and developed Individual Education Plans, Functional Behavior Assessments, and Behavior Intervention Plans based on the diverse needs of students.
- Conducted training for general education teachers, related service providers, parents/caregivers on working effectively with students with emotional and behavioral needs.
- Served as a member of the SAFE Crisis Management Team; responded and managed students experiencing severe behavioral challenges.
- Guided the learning process toward the achievement of curriculum goals and established clear objectives for all lessons, units, and projects.

- Supported student achievement; administered, scored, and interpreted assessments; maintained special education compliance.
- Provided technical assistance, professional development training and support for the implementation of the Kentucky Administration Regulations and the Individuals with Disabilities Education Act (IDEA).

Special Education Paraeducator Feb. 2006 to June 2016

- Assisted teacher in planning daily activities for core subjects in reading, math, science, and social studies in accordance with the curriculum.
- Guided the learning process toward the achievement of curriculum goals and established clear objectives for all lessons, units, projects.
- Designed and implemented a point system to encourage positive student behavior; this decreased challenging behaviors by 10% in the classroom during the school year.
- Tutored individuals or small groups; monitored and reported student progress.

Professional Development Workshops

Greater Louisville Education Cooperative, Diverse Learners Institute **July 2021**

- Delivered full week professional development for teachers and other support personnel on progress monitoring and IEP writing

Fayette County Public Schools, Summer Ignite **July 2021 & 2022**

- Provided training and technical assistance on social/emotional learning, behavioral strategies, and conflict management

Policy/Advocacy

HECSE Short Course: Education Policy and Politics, Washington D.C. January 2023

University of Louisville Doctoral Student Representative

- Identify the organizational structures and key players in special education related policy making in the nation's capital, including governmental agencies, non-profit organizations, and coalitions
- Demonstrate the skills and knowledge needed to become effective advocates on behalf of students with disabilities, including specific considerations that address special education and equity
- Articulate the history, purpose, and impact of HECSE as well as develop an understanding of how to establish and maintain relationships within the policymaking process

Special Education Legislative Summit, Washington D.C. **July 2022**

Kentucky State Team Leader

- In depth learning about key issues including legislation, appropriations, mental health, educator shortages, and more

- Improved advocacy skills with experts and learned how to sharpen the message brought to Capitol Hill
- Joined special educators across the United States in meeting with Members of Congress to make a difference for infants, toddlers, children, and youth with exceptionalities

PUBLICATIONS

Peer-reviewed Journals

Page, D., Landrum, T. (accepted with minor revisions) De-escalation with low-Intensity antecedent strategies: Implications for disproportionate disciplinary outcomes. Beyond Behavior.

McClure, E. B., Landrum, T. J., & **Page, D.** (accepted with minor revisions) Disparities in Discipline: Regression Analysis of the Influence of Sociodemographics and School Level on Students' Risk of Suspension. School Psychology Review.

Chapter

Landrum, T. J., **Page, D.**, & McClure, E. (invited). Disproportional discipline. In B. G. Cook, L. W. Collins, & T. J. Landrum (Eds.), Advances in Learning and Behavioral Disabilities, Vol 34. Bingeley, UK: Emerald.

EDITORIAL WORK

Reviewer, *Education and Urban Society* **June 2022 to Present**

Reviewer, *International Journal for Educational Reform* **June 2022 to Present**

CONFERENCE PRESENTATIONS

2023. McClure, E., **Page, D.** "From Micro to Macro: Embedding Equity and Cultural Responsiveness into a PBIS model." MSLBD Annual Conference, Kansas City, MO.

2022. Landrum, T., **Page, D.**, Collins, Lauren. "Antecedent Interventions, Behavior Modification, & Student Relationships: Bringing It All Together." TECBD Annual Conference, Tempe, AZ.

2022. Landrum, T., **Page, D.** "Antecedent Interventions: Enhancing Relationships, Reducing Disproportionality, and Consistency with Trauma Informed Care." TED Annual Conference, Richmond, Virginia.

2022. McClure, E., **Page, D.**, Landrum, T. "Disparities in Discipline and How to Combat Inequity." [poster] OSEP Leadership Conference.

2022. McClure, E., **Page, D.**, Landrum, T. "From Micro to Macro: Embedding Equity and Cultural Responsiveness into a PBIS model by Changing Practices at the Classroom and School-wide Levels." [poster] Kentucky CCBD Behavior Institute, Louisville, KY.

2022. McClure, E., **Page, D.**, Landrum, T. "Including and Supporting Diversity in a PBIS Classroom." Kentucky Excellence in Educator Preparation Annual Conference, Lexington, KY.

2022. Landrum, T., Collins, L., **Page, D.** "Improving behavior and Building student teacher relationships: connecting with students with EBD" MSLBD Annual Conference, Kansas City, MO.

2022. McClure, E., Landrum, T., **Page, D.** "Disparities in Discipline: The Influences of sociodemographics on students' risk of suspension and how to combat inequity." CEC Annual Conference, Orlando, FL.

2021. Landrum, T., **Page, D.** "Enhancing Relationships with Evidence-based classroom management: the best of both worlds." KY CEC Annual Conference, Louisville, KY.

2021. McClure, E., Landrum, T., **Page, D.** "Disparities in Discipline: The Influences of sociodemographics and specific disability on students' risk of suspension." TECBD Annual Conference, Tempe, AZ.

2021. Landrum, T., **Page, D.**, Fitchett, C. "Building Relationships with Evidence-based Behavioral Interventions: Guidelines for Teacher Educators." TED Annual Conference, Fort Worth, TX.

GUEST LECTURES

EDSP 450 MSD Practicum II Taught by Mary Elliott, University of Louisville
Being Culturally Responsive to Black Students

RESEARCH / FIELD WORK EXPERIENCE

- Exploring the Lived Experiences of Black Families Raising a Child with EBD
- A Meta Analysis of the Academic Achievement of Students with EBD
- A Meta Analysis of Numbered Heads Together and its Effects on Students with EBD
- Trends Over Time: Academic Achievement for Kentucky Middle School Students with Disabilities
- Disparities in Discipline: Influences of Sociodemographics on Students' Risk of Suspension

PROFESSIONAL AFFILIATIONS

American Educational Research Association (AERA) **May 2022 to Present**

Council for Exceptional Children (CEC) **July 2016 to Present**

CEC Division for Culturally and Linguistically Diverse Exceptional Learners (DDEL)

- Student Representative to Executive Committee **August 2020 to Present**

CEC Division for Emotional and Behavioral Health (DEBH)

- Professional Development Committee Member **August 2020 to Present**

CEC Teacher Educator Division (TED)

- Diversity Caucus Member **August 2020 to Present**

HONORS / AWARDS

Evidence-Based Practices Leadership Grant **August 2020 to Present**
Office of Special Education Programs

OSEP Scholar of the Month **June 2022**
Office of Special Education Programs

OSEP Scholar of the Month **March 2023**
Office of Special Education Programs

SERVICE

Graduate Student Council, University of Louisville, member **August 2020 to Present**

Conference proposal reviewer TED Annual Conference 2022 **June 2022**

COURSES TAUGHT

University of Louisville, Louisville KY

EDSP 260: *Classroom and Behavior Management* **Fall 2020**

Description: The study and application of behavioral principles for effectively managing classroom environments

EDSP 518: *Structured Literacy for Diverse Learners* **Spring 2021**

Description: This course addresses evidence-based methods and strategies used to teach literacy skills to diverse learners. Prepares candidates to teach the five components of reading through explicit systematic and sequential instruction.

EDSP 675: *Characteristics, Needs, and Assessments for EBD Students* **Summer 2022**

Description: Study and application of principles appropriate for the education and management of behavior disorder children in the regular classroom