

**Inclusion of Students with Intellectual and Developmental Disabilities and  
Postsecondary Outcomes: A Systematic Literature Review**

Joshua P. Taylor<sup>1</sup>, Magen Rooney-Kron<sup>2</sup>, Holly N. Whittenburg<sup>1</sup>, Colleen A. Thoma<sup>1</sup>, Lauren

Avellone<sup>1</sup>, and Hannah Seward<sup>1</sup>

Virginia Commonwealth University<sup>1</sup>

University of Illinois at Urbana-Champaign<sup>2</sup>

# INCLUSION OF STUDENTS WITH IDD AND POSTSCHOOL OUTCOMES

## **Abstract**

The purpose of this systematic literature review was to examine the association between inclusive education and postsecondary outcomes for individuals with intellectual and developmental disabilities (IDD). Despite decades-long advocacy efforts, most individuals with IDD never achieve meaningful paid employment or enroll in postsecondary education after graduation from high school. Although educational and workforce legislation has emphasized both inclusive education and competitive integrated employment for youth with IDD, no previous reviews have examined the strength of evidence for the former as a pathway to positive postsecondary outcomes. This systematic literature review searched peer-reviewed articles published between 1997 and 2018. A total of nine studies met inclusion criteria. The majority of studies found positive effects for inclusive education on either postsecondary employment or education using correlational designs. Limitations to the included studies, implications and recommendations for practice, policy, and future research are discussed.

*Keywords:* Inclusive education; Employment; Postsecondary education; Transition; Intellectual disability; Autism Spectrum Disorder

**Inclusion of Students with Intellectual and Developmental Disabilities and Postsecondary Outcomes: A Systematic Literature Review**

Postsecondary outcomes for youth with intellectual and developmental disabilities (IDD) remain poor, with a majority lacking opportunities to secure and maintain competitive integrated employment or engage in postsecondary education (Wehman et al., 2018). In order to address these issues, the focus of much of the research into transition-age students has examined the pathways individuals could follow to achieve sustained competitive integrated employment following graduation and enrollment and persistence in postsecondary education (Siperstein et al., 2014). Previous research on the post-school outcomes of youth with disabilities has revealed several predictors of success in employment and education (Mazzotti et al., 2016; Test et al., 2009). While many of these factors predict only employment or education, and vary in their strength of evidence, two main effects have a strong correlation with positive outcomes for both employment and education—inclusion in general education with typically developing peers (e.g., Chiang et al., 2012) and access to robust work-based learning opportunities including paid work prior to graduation (Carter et al., 2012).

Individuals with IDD benefit from instruction and practice in natural environments—in both schools and communities—where skills can be generalized more effectively (e.g., Brown et al., 1983; Kellems & Morningstar, 2012; Neely et al., 2016; Stokes & Baer, 1977) and greater opportunities for self-determination exist (e.g., Hughes et al., 2013). For school-aged students, one of the most important natural environments to learn and apply functional skills meaningfully is the general education classroom. Historically, students with IDD have been removed from inclusive settings to receive specially designed instruction in more segregated settings (Kurth, et al., 2014). This segregation is often justified by the difference in curricular goals related to

transition planning and a focus on life and work skills for students with IDD. Thus, it is of high value to increase understanding of how inclusive educational experiences influence individuals' long-term outcomes.

### **Context**

Internationally, inclusive education has focused broadly on the equitable access to education for students who have been historically excluded, whereas in the United States, it has been focused more narrowly on access to general education curriculum and settings for students with disabilities (Waitoller & Artiles, 2013). Research consistently recommends inclusive education as a best practice for all students (e.g., Kurth et al., 2018; Thompson et al., 2018). However, it is unclear whether decisions about inclusive education are determined by individual student requirements for specially-designed instruction in more restrictive settings, or whether other factors such as limited resources, staff training, and teacher competencies to tailor appropriate supports influence these decisions. Special educators, especially in secondary grades, may struggle to support students' transition-related goals in academically-focused classrooms, further decreasing the likelihood that students with disabilities are included in general education classrooms. While many researchers recommend educational programming that provides both rigorous academics and robust transition-focused programming (Courtade et al., 2012; Test et al., 2014), teachers often struggle to accomplish both.

Inclusive education policy is shaped by three main pieces of legislation: (a) the Individuals with Disabilities Education Improvement Act of 2004 (IDEA), (b) the Every Student Succeeds Act of 2015 (ESSA), and (c) the Americans with Disabilities Act of 1990 (ADA). ESSA, like its predecessor—the No Child Left Behind Act of 2001—strengthened federal education requirements to ensure that all students are included in accountability measures,

including those with disabilities who have been historically excluded. Under IDEA, students are required to receive instruction in the Least Restrictive Environment (LRE) to the maximum extent possible alongside nondisabled peers in general education classrooms. Although the LRE mandates inclusive education with supplemental aids and services when possible, the recent court ruling *Andrew F. v. Douglas County* (2015) reinterprets the requirements of a free and appropriate public education under IDEA. This court ruling rejects the previous interpretation that a student can receive “merely more than *de minimis*” benefits. Thus, school districts are required to provide specially designed instruction that should be reasonably sufficient to ensure a student’s educational progress.

While IDEA and ESSA are regarded as the primary legislative policies governing special education and public education respectively, the ADA has increasingly been cited by the Department of Justice in cases to ensure the inclusion of individuals with disabilities as a right to equal access. Recently, the Department of Justice’s Office of Civil Rights sued the state of Georgia for its use of a regional special education program in which students with significant disabilities were segregated and provided little to no interaction with nondisabled peers in school or community settings (U.S. Department of Justice, 2016).

Thus, federal policy and legislation generally confers widespread support for the inclusion of people with disabilities in schools and classrooms. However, many students with disabilities—especially those with IDD—continue to receive services in segregated educational settings. Given the increased accountability requirements placed on school districts to ensure student progress as a result of the *Andrew F. v. Douglas County* (2015), it is critical that research provide a clearer method of evaluating the potential benefit of inclusive education not only on the progress, but also the post-school outcomes of students with IDD.

### **Theoretical Framework**

Given the complexity of discussions surrounding inclusive education and how efforts are nested within school and community contexts, Bronfenbrenner's (1976) ecological systems theory provides a useful framework for examining this literature and analyzing findings. The social-ecological lens has previously been used in reviews of preschool inclusion (Odom et al., 2004), access to the general education curriculum (Ruppar et al., 2017), and self-determination (Shogren, 2013) research. Bronfenbrenner (1976) describes the development of an individual occurring within nested systems embedded within one another, each containing contextual factors that influence and are influenced by one another. Identifying these factors as they emerge from the reviewed literature and organizing them within this framework allows for more systematic consideration of how inclusive education operates within the broader context of student-teacher-family interactions (micro- and mesosystem), in regard to policy and legislation (i.e., exosystem), from overarching social and cultural beliefs and attitudes (i.e., macrosystem), and within changes over time (i.e., chronosystem). Developing a better understanding of how individual, family, school, community, and policy factors influence inclusive education may provide a roadmap to better post-school outcomes, and is critical to addressing this phenomenon in research, policy, and practice.

The purpose of this literature review is to examine the relationship between inclusive education and postsecondary outcomes to determine the strength of evidence for these experiences as a recommendation for all individuals with IDD. Although previous systematic reviews into the postsecondary outcomes of students with disabilities (e.g., Haber et al., 2016; Mazzotti et al., 2016) have provided support for inclusive education as a pathway to improved outcomes, these reviews were not specific to students with IDD. These students often experience

the poorest postsecondary outcomes and are most often segregated in school (Wehman et al., 2018). While inclusion and postsecondary success are correlated in much of the literature, a causal relationship cannot be established. Potential confounders include the fact that individuals who had greater access to general education instruction may also share other characteristics (e.g., intellectual ability, adaptive skills, parental advocacy). It is unclear whether these factors might also explain outcomes, and dilute claims of efficacy for inclusive education. Furthermore, the complexity of inclusion measures themselves and their meaning and significance for this highly diverse group of students and their individual goals and needs is less clear. Inclusion is sometimes used to indicate a philosophy, a setting, facilitation of interaction between individuals, or access to specific types of educational services. Also unknown is how the inclusive education of individual students and its long-term impact is related to external systems-level factors such as school, district, and state policies and practices. Research questions for this review include the following:

*Research question 1:* To what extent does the inclusion of students with IDD result in improved postsecondary outcomes?

*Research question 2:* How is inclusive education defined in the research literature that pertains to individuals with IDD and postsecondary outcomes?

*Research question 3:* How do students' ecological systems inform the effect of inclusive education and its impact on postsecondary outcomes?

### **Method**

Three search strategies were employed in an attempt to construct a systematic, nonbiased, representative sample of published studies. First, relevant studies were identified through computer searches of ERIC, EBSCO, PsycINFO, and Web of Science using the following search

terms: *Inclus\* OR inclu\* education\* OR mainstream\* OR Access to general education\**, and *Transition OR postsecondary OR post-graduat\* OR employ\* OR adult\**, and *Intellectual disabilit\* OR developmental disabilit\* OR autis\* OR ASD OR HFA OR Asperger\**. Second, reference lists of each included study were reviewed and considered for identification in the sample based on inclusion and exclusion criteria. Third, the reference list for inclusive education and access to general education as a predictor of postsecondary success as maintained by the National Technical Assistance Center on Transition was reviewed and included in the sample set. Search criteria were limited to those studies published since the reauthorization of IDEA 1997, which included both previous requirements for transition planning (IDEA 1990) and an emphasis on access to the general education curriculum.

### **Inclusion criteria**

Articles eligible for inclusion were: a) empirical studies (e.g., quantitative and qualitative); b) focused on services provided in the United States; c) focused on middle and/or high school students; d) examined postsecondary outcomes in employment or postsecondary education; and e) examined the impact of inclusive education, instructional setting, or access to the general education curriculum. While inclusive education in preschool and elementary grades are also an important area of research, studies were limited to secondary grades to more closely examine the relation between more recent educational experiences and postsecondary outcomes.

### **Exclusion criteria**

Studies were excluded that focused primarily on college students or adults, in which researchers did not examine factors relating to K-12 schooling experiences. As a result, studies with students ages 18-22 who were dually enrolled in college programs were excluded. Although these studies may give useful insight into the inclusive experiences of individuals with

disabilities after graduation, they do not address the main research question of whether K-12 inclusive education results in successful postsecondary outcomes for students. Likewise, studies without any postsecondary measure were also excluded from the sample.

Postsecondary outcomes were limited to those related to employment or postsecondary education and excluded those that examined outcomes in independent living. While independent living is often included as a core component of transition planning, previous research has documented the difficulty of establishing clear outcome indicators for this area given the wide range of personal, familial, and sociocultural factors influencing outcomes (Henninger & Lounds Taylor, 2014). Additionally, articles that investigated curriculum were excluded if it was unclear whether instruction took place in an inclusive or segregated setting. Finally, case studies and other practitioner-oriented manuscripts were also excluded since they do not include grounded or empirical data to support findings.

### **Procedure**

After removing duplicates and uploading all studies using Zotero, a reference management software, coding was conducted in full by the first author and verified with an audit check by two of the co-authors using a sub-sample of studies from each stage. The first stage of coding consisted of screening using titles and abstracts using the inclusion and exclusion criteria. Studies were included liberally at this stage so as not to exclude a relevant study unintentionally. Two of the co-authors repeated the process with an audit sub-sample of 30% of the full sample ( $n = 1,747$ ). Inter-observer agreement (IOA) was calculated by dividing total agreements by total screened. IOA for title and abstract screening was 98.6%. A total of 101 studies were reviewed in full-text by the first author and audited (subsample of 30% of full sample;  $n = 31$ ) by two of the co-authors. Studies excluded at this stage were coded by specific relevant exclusion criteria.

IOA at the full text phase was 96.8%. Discrepancies at each stage were discussed between team members to ensure all relevant literature was included. Figure 1 shows the process by which studies sampled in the initial selection process were systematically refined, resulting in the final sample included in this literature review. Finally, included studies were analyzed for adherence to quality indicators specific to their respective correlational (Thompson et al., 2005) and qualitative (Brantlinger et al., 2005) methodologies. Quality indicator analysis was also audited with 30% of the sample of articles ( $n = 4$ ) with an IOA of 84.0%. Based on the small number of studies meeting inclusion criteria, none were removed based on quality indicators; however, the results of the quality analysis are presented in the subsequent section.

[INSERT FIGURE 1 ABOUT HERE]

### **Results**

A total of nine articles met the inclusion criteria for this systematic literature review (see Table 1). Of the nine studies, eight reported a positive relationship between at least one inclusive education predictor and at least one postsecondary outcome in either employment or postsecondary education. One of the nine studies did not find a statistically significant relationship between inclusive education and postsecondary education (Foster & Pearson, 2012). Table 1 shows a summary of the studies included in the review along with participant demographic information. The results of the review with regard to population and overall findings, methodology, inclusive education predictors, postsecondary outcome measures, and implications and limitations of the included studies are discussed below.

[INSERT TABLE 1 ABOUT HERE]

### **Overall Findings**

Overall results of studies included positive effects for specific employment outcome variables (i.e., work status, wages, hours, benefits) in eight of the nine studies, with one (Foster & Pearson, 2012) reporting no effect. The heterogeneity of methodologies employed prevents aggregating impact sizes across studies, but regression results ranged from levels of significance between  $p = 0.001$  (White & Weiner, 2004) and  $p = 0.40$  (Foster & Pearson, 2012). Reported odds ratios in two studies were both over 4.0, where inclusive experience increased the odds of improved employment outcomes (i.e., hours and wages; Chan et al., 2018), and attending a regular school (i.e., not a special school exclusively for students with disabilities) increased the likelihood of postsecondary education enrollment (Chiang et al., 2018) by over 400%. However, Foster and Pearson (2012) found no effects in their study of youth with ASD when controlling for individual and system factors using a covariate design.

### **Population (Disability Type and Demographics)**

The total sample population across the nine studies was 1,910. Participants included individuals with IDD, per the focus of this review, though specific disability label varied by study. Given the focus on transition-aged youth, participants in studies ranged from age 10 (at the beginning of a longitudinal study) to 25. Of the 1,910 students, 71.0% of participants whose gender was reported ( $n = 1,272$ ) were identified as male and 29% ( $n = 529$ ) were identified as female. Among studies that reported race and ethnicity, 65.1% ( $n = 1114$ ) of participants were White, 22.0% ( $n = 376$ ) Black, 2.2% ( $n = 38$ ) Latino, 1.3% ( $n = 23$ ) Asian, 0.2% ( $n = 3$ ) Hawaiian or Pacific Islander, 0.1% ( $n = 1$ ) Native American, and 9.2% ( $n = 157$ ) other or not specified.

### **Methodology Across Studies**

Seven studies employed quantitative methodologies while two used a qualitative approach. Samples were drawn from a range of sources with the most frequent being survey data ( $n = 5$ ). Of these, two studies utilized data from the National Longitudinal Transition Study-2 (NLTS-2; Chiang et al., 2012; Foster & Pearson, 2012). A variety of quantitative methods were used to test the relationship between inclusive education and postsecondary outcome, with regression ( $n = 4$ ) being the most common form of analysis. One study used propensity score methodology with covariates (Foster & Pearson, 2012). Qualitative studies employed records reviews and interviews as data collection measures and used content analysis and triangulation strategies to ensure trustworthiness (Ryndak, Ward, Alper, Montgomery & Storch, 2010; Ryndak, Ward, Alper, Storch, & Montgomery, 2010).

### **Inclusive Educational Predictor(s)**

Measures of inclusive education varied greatly between studies; however, all studies focused on the extent to which students with IDD received instruction in general education settings. Most studies examined levels of inclusion, measured by time in general education classrooms and extra-curricular activities (Baer et al., 2011; Chan et al., 2018; Foster & Pearson, 2012; Luftig & Muthert, 2005; (Ryndak, Ward, Alper, Montgomery & Storch, 2010; Ryndak, Ward, Alper, Storch, & Montgomery, 2010), as well as peer interactions (Ryndak, Ward, Alper, Montgomery & Storch, 2010; Ryndak, Ward, Alper, Storch, & Montgomery, 2010; White & Weiner, 2004). Many of the studies collapsed multiple dimensions of inclusive education such as inclusion in academic and non-academic activities (Chan et al., 2018; Ryndak, Ward, Alper, Montgomery & Storch, 2010; Ryndak, Ward, Alper, Storch, & Montgomery, 2010) or LRE and time spent with typical peers (White & Weiner, 2004). Studies which examined the amount of time a student spent in the general education classroom or LRE used ordinal categories to

calculate levels of inclusion rather than using a continuous percentage. Other studies measured whether or not the student attended a typical high school or special school (Chiang, et al., 2012; Luftig & Muthert, 2005; Simonsen & Neubert, 2013).

### **Postsecondary Outcome(s)**

Seven of the nine studies measured employment as an outcome, while three examined postsecondary education. Only one study included both variables (Baer et al., 2011). Studies focused on employment varied slightly in how successful outcomes were defined. Some studies defined employment outcomes by using minimum wage (Baer et al., 2011; Chan et al., 2018; Luftig & Muthert, 2005; Simonsen & Neubert, 2013) and minimum hours per week thresholds (Baer et al., 2011; Chan et al., 2018), as well as defining employment as community-based (Chan et al., 2018; White & Weiner, 2004) in contrast to segregated and sheltered work alternatives (Ryndak, Ward, Alper, Montgomery & Storch, 2010; Simonsen & Neubert, 2013). Additionally, Luftig and Murthert and Ryndak and colleagues each examined job history and employee benefits of participants. For all postsecondary education studies, successful outcomes were defined by enrollment, attendance, or participation in postsecondary education including two- and four-year colleges, universities, vocational training, and other adult education options (Baer et al., 2011; Chiang et al., 2012; Foster & Pearson, 2012).

Studies measuring the impact of inclusive education on employment ( $n = 7$ ) reported positive effects. Chan and colleagues (2018) found that having inclusive education as a child was a strong predictor of employment after graduation with an odds ratio of 4.13. Several additional studies found statistically significant relationships between participants with ID who experienced higher levels of inclusive education as students and community integrated employment outcomes (Luftig & Muthert, 2005; Simonsen & Neubert, 2013; White & Weiner, 2004).

Studies investigating postsecondary education were less conclusive. Two of the three studies found positive effects for students with multiple disabilities and autism; Baer and colleagues (2011) reported that inclusive experience nearly doubled the chances of postsecondary education for a sample of individuals with ID and multiple disabilities. Additionally, Chiang and colleagues (2012) found that attending a regular high school increased odds of enrollment in postsecondary education by 432% for graduates with ASD. However, Foster and Pearson (2012) did not find positive results in their study of the effect of time spent in general education and enrollment in postsecondary education for youth with autism. These researchers analyzed NLTS-2 data through a propensity score methodology, which used covariates to control for individual and student-level characteristics.

### **Ecological Results**

The ecological systems investigated were closely related to the types of methods researchers used. Quantitative studies exclusively focused on microsystem-level factors (i.e., enrollment in academic courses, non-academic courses, and extracurricular activities) that served as indicators of inclusive education and their impact on student outcomes. Not only were factors related to external ecological layers (e.g., exosystem, macrosystem) absent from the quantitative research, but no quantitative studies addressed the chronosystem, or how inclusive education experiences for students may have changed over time—either across grade levels for the individual or over time based on policy changes. In contrast, the two qualitative studies (Ryndak, Ward, Alper, Montgomery & Storch, 2010; Ryndak, Ward, Alper, Storch, & Montgomery, 2010) provided a much more holistic examination of how participants' ecology impacted their educational and post-school experiences. Although both studies were organized chronologically (i.e., chronosystemically), both studies included rich information about not only the educational

characteristics of participants and their microsystemic experiences but also their mesosystemic support network of family members, educators, and peers. Interestingly, each of the qualitative studies compared the longitudinal educational and postsecondary experiences of two youth with contrasting experiences regarding inclusive education. In each study, the participant with greater support needs relative to communication, reading, and academic skills actually received more inclusive K-12 experiences. In both cases, youth with more inclusive educational experiences not only achieved better outcomes in terms of employment quality (i.e., wages, hours, stability), but also in terms of social integration and self-determination.

### **Discussion**

In order to prepare students for an inclusive life after high school, it is important to understand the extent to which inclusion during their secondary years impacts their post-school outcomes. Through a systematic review of the research literature, nine studies were identified that examined the influence of inclusive education on postsecondary outcomes for individuals with IDD. Overall, studies included in this review present promising but mixed support for inclusive education as a pathway to employment and postsecondary education. However, it should be noted that methodologies largely used to examine the relationship between these factors in the literature were exploratory, non-experimental, and cannot be used to describe causal relationships. In fact, the sole causal-comparative study that used propensity scoring to investigate potential causality found no relation between the amount of time students spent in general education and their postsecondary education outcomes after controlling for individual characteristics (Foster & Pearson, 2012). Furthermore, none of the studies examined other potentially confounding variables such as quality of instruction, school resources and expertise devoted to inclusive educational efforts, or moderating effects of individual-level traits. Given

the limitations in the design and scope of studies, it is difficult to draw conclusions about the overall effectiveness of inclusive education as a pathway to positive postsecondary employment and educational outcomes. Below we discuss themes emerging from results of the review and recommendations for research, policy, and practice.

### **Relationship Between Inclusion and Postsecondary Outcomes**

This systematic review provides preliminary support for the positive impact of inclusive education for students with IDD. Multiple studies reviewed describe significant positive relationships between inclusion during K-12 schooling and successful employment outcomes and between inclusion and postsecondary education enrollment. However, eight of the nine reviewed studies employed design methodologies that may not have adequately addressed the possible impact of confounding factors. Given that only one study (Foster & Pearson, 2012) employed a more complex covariate design finding no effect for inclusive education on postsecondary outcomes, the relationship between these two factors may be more complex than described in the literature to date. Further research is needed that considers potential mediating and moderating effects of system- and individual-level factors such as individual participant characteristics, staff competence, alignment of instruction with transition goals, district and state policy, and collaboration between special and general educators and adult service agencies and providers.

### **Definitions of Inclusive Education**

Since the studies included in this review are mainly quantitative, drawing from large samples of extant student data in non-experimental designs, it is not surprising that the operationalized definitions of inclusive education employed in the included studies were mainly focused around a narrow, quantitative measure of physical inclusion at the school or classroom level (e.g., Baer et al., 2011; Simonsen & Neubert, 2012). For example, three studies' definitions

of inclusion were limited to enrollment in a typical school, while another four studies included only ordinal clustered measures of LRE rather than a continuous value of LRE percentage. For the purposes of this review, studies examining curriculum type were not included. However, future research is warranted to better understand how the inclusion of students with IDD is affected by decisions to participate in aligned curricula and alternate testing, especially given the alignment between curriculum, testing, and graduation requirements in many states and districts.

### **Ecological Systems Influence**

Although ecological systems theory (Bronfenbrenner, 1976) is widely used in the research literature as a theoretical lens for analyzing and interpreting inclusion research (e.g., Odom et al., 2004; Ruppert et al., 2017; Shogren, 2013), the studies included in this review, especially those with quantitative designs, primarily focused on individual factors and characteristics of students' direct support service networks (microsystem), either in terms of school or vocational systems. Investigation of relationships between mesosystem factors, such as access to the general education curriculum and family advocacy involvement, and microsystem factors, such as individual teacher beliefs and expectations may be helpful in identifying how different variables affect access to inclusive environments and ultimately, postsecondary education outcomes. Although these types of relationships were explored descriptively in the two qualitative studies (Ryndak, Ward, Alper, Montgomery & Storch, 2010; Ryndak, Ward, Alper, Storch, & Montgomery, 2010), this review revealed a distinct lack of quantitative research examining how factors within and between specific ecological system levels affect access to inclusive settings during educational decision-making (Ruppert et al., 2017). Given that results from qualitative studies contradicted the assumption that individuals with more significant disabilities require more restrictive educational settings, more research is needed which examines

intersections of inclusive education itself with other K-12 and postsecondary ecological factors (e.g., social integration, support network, self-determination). As previously discussed, these variables may mediate the effect of inclusive education on post-school outcomes and should be further investigated.

### **Limitations**

There are several limitations related to the current literature review. First, the review focused on studies published in peer-reviewed journals. The exclusion of dissertation studies and other types of research reports may have led to publication bias. Second, this literature review concentrated specifically on inclusion. Expanding the article search to include constructs often associated with inclusion, such as the LRE and general education, could have unearthed additional studies. Similarly, the researchers narrowed the range of articles to studies whose samples included middle or high school students. Adjusting inclusion criteria to include samples with both younger students and students in postsecondary education could have produced different results. Additionally, studies included in this review focused exclusively on K-12 inclusive education, so it is unclear how other community-based work experiences and other experiences predictive of post-school success may relate to student outcomes.

### ***Quality of Studies***

As mentioned above, given the small number of articles eligible based on inclusion criteria, we did not exclude any articles based on adherence to quality indicator standards. The results of our analysis found that none of the 11 studies met criteria for all quality indicators for their respective methodologies; however, these findings should be interpreted with significant caution, given the divergence in findings from previous reviews (e.g., Mazzotti et al., 2016; Test et al., 2009). Given this discrepancy in results, there is a clear need to revisit quality indicator

checklists used to evaluate the rigor of research studies and consider more granular operationalization of specific indicators and ensure that selected indicators remain salient markers of high-quality research. Both qualitative studies met quality indicators (Brantlinger et al., 2005) in the majority of domains (e.g., interview protocol, document analysis, data analysis), but omitted several details required for observational studies (Ryndak, Ward, Alper, Montgomery & Storch, 2010; Ryndak, Ward, Alper, Storch, & Montgomery, 2010). The studies also included little information to address Brantlinger and colleagues' requirement that qualitative studies provide rich information in the way of the researcher's personal position or perspective (Ryndak, Ward, Alper, Montgomery & Storch, 2010; Ryndak, Ward, Alper, Storch, & Montgomery, 2010). Correlational studies did not meet criteria for most of the specifications listed on the indicator checklist (i.e., Thompson et al., 2005). Most studies did address some aspects of all of the subdomains (i.e., measurement, practical/clinical significance, macro-analytic considerations, use of confidence intervals and effect sizes) but none addressed all listed components of each. For example, while many did report effect size for study participants themselves, effect sizes were not compared to those of prior research. Confidence intervals were comprehensively omitted in the majority of correlational studies, and when presented were often limited to reporting on the confidence intervals only for descriptive statistics unrelated to the main research questions. However, as mentioned above, the results of this analysis should be interpreted with significant caution given the difference in findings from previous reviews and points to a need to examine both quality indicators and research designs of future studies to bring both into closer alignment.

### **Recommendations for Research**

Results of this review point to a clear need for further research to clarify the extent to which inclusive education relates to post-school employment and PSE outcomes. A more sophisticated and thorough understanding of these relations may inform how individualized education program (IEP) teams make decisions regarding competing educational priorities. To accomplish this, future research should include more rigorous research designs including randomized control trials in order to address the lingering question of how the benefits of inclusive education are moderated by individual-level factors. However, the ethical complications not only of clinical trial research in general (e.g., Nardini, 2014), but also the specific considerations of providing or withholding potentially effective treatment for individuals with IDD make these designs problematic to implement in practice. One solution might be for researchers to test randomized designs nested within school contexts so as not to deny students a fair and appropriate public education, or to examine system-level changes based on policies and interventions within schools or districts.

Additionally, research using multi-level modeling and more robust system-level analysis of secondary data would also provide greater insight into the impact of school and district inclusive education policies on student outcomes. Foster and Pearson (2012) found no effect related to inclusive education when controlling for individual covariate—an outlier among studies included in this review. Replication of their design with a new sample and alternate covariates would be of great benefit to inform whether their results are true outliers or related to superior methodology better describing the outcome variance of this population. Finally, future research should more closely examine potential interaction between inclusive education and other individual factors like student agency, self-determination, social skills, or family expectations that in turn improve postsecondary outcomes. Students with disabilities represent a

heterogenous population and thus they may experience the benefits of inclusion differently depending on these individual-level characteristics.

### **Recommendations for Practice**

Although this review indicates a need for more rigorous research into the relationship between inclusive education and postsecondary outcomes, it also adds credence to a growing consensus among researchers for improved educational programming for students with IDD. Educational programming is needed that emphasizes inclusive approaches to rigorous academic instruction, includes robust functional skills instruction, and incorporates community- and work-based learning experiences (Ayres et al., 2012; Courtade et al., 2012; Test et al., 2014). Practitioners can support the inclusion of students with IDD in general education environments by maintaining and communicating high expectations for students, using evidence-based practices to increase student learning, and advocating for placements within the LRE. Furthermore, practitioners should consider ways to provide students with inclusive work-based learning experiences, as these experiences are predictors of post-school employment (Mazzotti et al., 2016). For example, inclusive service-learning experiences provide students with and without disabilities the opportunity to receive rigorous instruction, learn work skills, and contribute to their community (Dymond et al., 2008; Luecking, 2020).

### **Recommendations for Policy**

First and foremost, there is a great need for additional funding to conduct more research and more rigorous experimental designs to explore the experiences of individuals with IDD and to reverse persistent and negative postsecondary outcomes. Projects like the Promoting the Readiness of Minors in Supplemental Security Income (PROMISE) demonstration grants offer a potential model for evaluating not only the efficacy of interventions and experiences like

inclusive education measures but also a pathway to economic independence for individuals and families. While the findings of this review are not strong enough to suggest a causal relationship between inclusion and postsecondary outcomes, policymakers should continue to encourage inclusion of students with IDD in academic and nonacademic participation through policy and legislation, while also ensuring that robust and effective specially designed instruction is provided to all students, regardless of educational placement. Finally, as Congress considers reauthorization of the Higher Education Opportunity Act (2008), there is an opportunity to make a strong commitment to integrated postsecondary education experiences as the preferred outcome of for all students, including those with IDD, using the model of competitive integrated employment emphasized by the Workforce Innovation and Opportunity Act of 2014.

### **Conclusion**

Inclusive education is widely viewed as an ethical imperative and educational best practice for students with IDD despite a continued trend of non-inclusive placements and outcomes for this population over the last decade. Furthermore, the legal mandate of IDEA to provide instruction in the LRE and the recently refined requirements to demonstrate reasonable progress (i.e., *Endrew F. v. Douglas County School District*) heighten the need for research evaluating inclusive education as a pathway to success. As evidenced in the studies reviewed, there remains significant complexity and a lack of consensus about how inclusion should be operationalized in research and practice. While thinly investigated for this group of students, research generally points to promising outcomes for students who receive inclusive educational opportunities prior to graduation. However, limited studies and variance in the definition of variables illuminate the clear need for investment in more rigorous research related to these questions for individuals with IDD.



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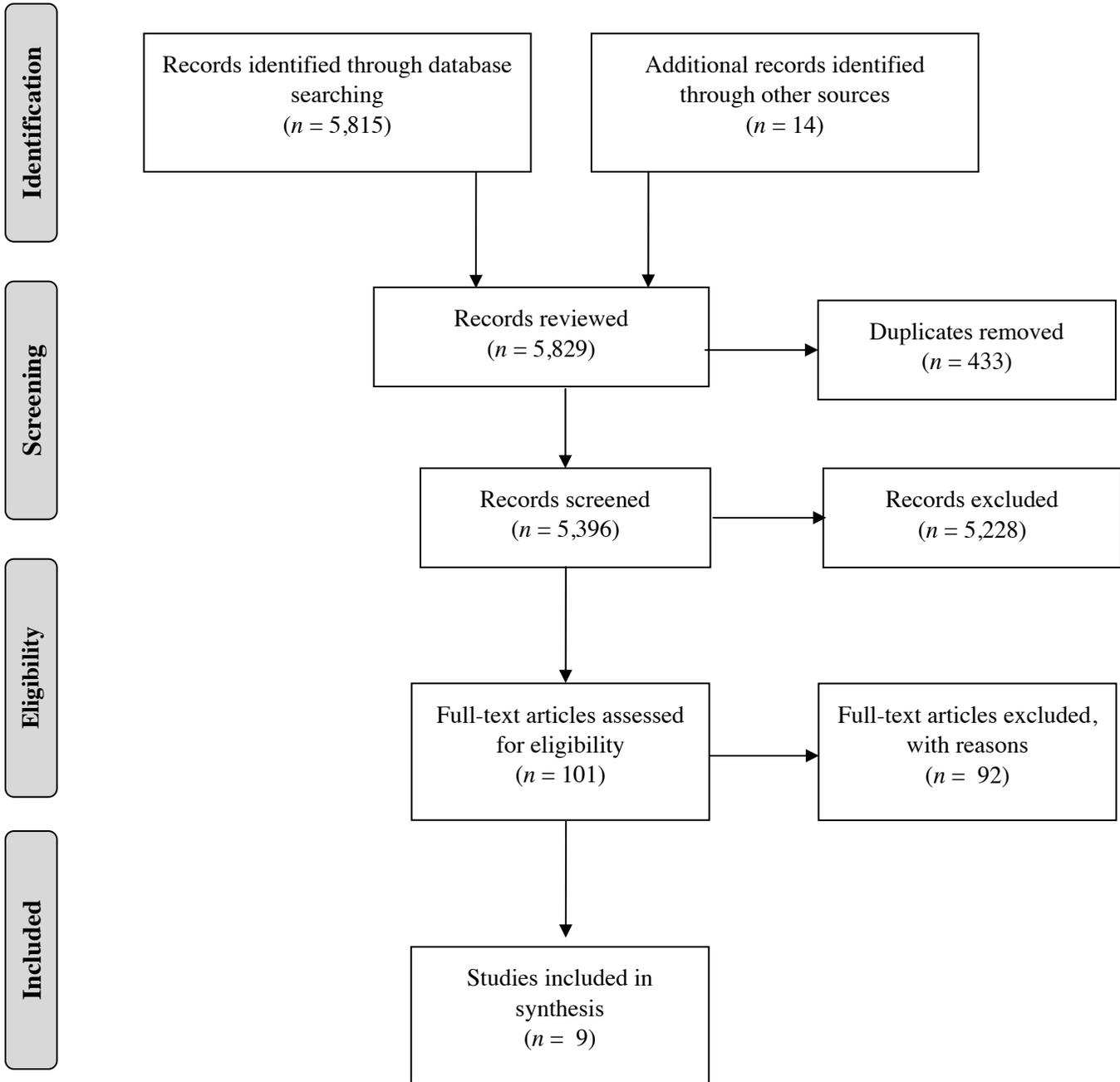
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APPENDIX

**Figure 1**

*Screening and Review Process*



**Table 1***Results of Systematic Literature Review*

Citation	<i>n</i>	Disability	Demographics	Methodology	Inclusive education predictor(s)	Postsecondary outcome(s)	Overall Findings
Baer et al. (2011)	409	321 MR, 88 multiple	196 female 212 male 243 White 149 African American 13 Other Ages 14-21 Sample taken from survey of 177 districts in Midwest	Bivariate correlation & logistical regression based on survey and interview data (items based on NTLS)	Time spent in Gen Ed at least 80%	Postsecondary education & Employment (i.e., working 35 hours per week for competitive pay)	Inclusion of students with ID nearly doubled their chances of PSE ( $p=0.036$ )
Chan et al. (2018)	105	ASD	96.2% White 72.4% male Average age = 33.38 during study Longitudinal sample taken from MA & WI Ages 10+ - adulthood	Logistic regression & odds ratio using longitudinal survey & standardized assessment data	Survey respondents indicated level of 'inclusion in school for both academic and non-academic activities'	Employment (i.e., working for pay in the community more than 10 hours per week)	Inclusive education experience as a child a powerful predictor of employment (odds ratio=4.13)
Chiang et al. (2012)	430	ASD	70 female 300 White 130 race/ethnicity not specified Sample taken from NLTS-2 data Ages secondary-postsecondary	Backward logistic regression analysis	School type- Attended a regular high school or special school	Postsecondary education	Odds of attending PSE if attending a regular school increase by 432%, all else constant
Foster & Pearson (2012)	484	ASD	328 male 67 female	Propensity-score methodology	Time spent in Gen Ed classroom	Postsecondary education	Students who spent the majority of their time in

			250 White 73 African-American 71 Other Sample taken from NLTS-2 data Ages secondary-postsecondary	using covariates	(0%; 1-74%; 75-100%)		Gen Ed classrooms were not more likely to attend PSE ( $p=.40$ )
Luftig & Muthert (2005)	36	19 MR, 17 SLD	21 male 15 female Sample taken from graduates with disabilities at a CTE high school in Ohio	Quasi-experimental case study based on data from 16-item survey	School type and Gen Ed classroom - inclusive CTE courses	Employment- Wages, job history, employee benefits	68% of program graduates with MR employed; however, this rate significantly lower than graduates with SLD ( $p<0.05$ )
Ryndak, Ward, Alper, Montgomery & Storch (2010)	2	Multiple	1 female with cognitive and multiple disabilities 1 male with cognitive disabilities Both 25 years-old Eventually married	Qualitative-records review, interviews, observations	Various-participation in Gen Ed classes and extra-curriculars; typical peer interaction	Employment-competitive vs. sheltered employment; Access to benefits	Comparison of experience revealed academic and social skill growth and engagement in PSE & PSE after graduation for student with inclusive HS experience
Ryndak, Ward, Alper, Storch, & Montgomery (2010)	2	Multiple	2 male (brothers) 17 and 28 years-old	Qualitative-records review, interviews, observations	Various-participation in Gen Ed classes and extra-curriculars; typical peer interaction	Employment-supports	Themes included benefits of participation in social activities that promoted self-advocacy and development of skills in natural learning contexts
Simonsen & Neubert (2012)	338	IDD	206 male 132 female 48.8% White 44.4 Black 2.7% Asian	Descriptive statistics and multinomial logistic regression model using	Typical high school	Employment-community work for pay, sheltered work, wage (at least minimum)	57.1% engaged in sheltered work; 43% working in CIE; 33% earned at least minimum wage; significant

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			2.7% Latino 1% Mixed race 0.3% Pac. Islander 0.3% Native Amer. Graduated HS in 2008	survey data			bivariate relationship between typical high school and work outcome ( $p=0.05$ ) but variable excluded from final model
White & Weiner (2004)	104	Mild to profound MR	53.8% male 46.2% female 53% White 28% Hispanic 13% Asian 4% African-American 2% Pac. Islander Ages 21-25	Chi-square non-parametric test of independence based on data collected from interviews, record reviews, and observations	Least-restrictive environment/time spent with typical peers (4 point ordinal scale)	Employment-Community-based work	Level of integration statistically significant predictor of employment ( $p=0.001$ ); 69.2% of graduates of fully integrated educ. setting employed.

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*Note.* MR = mental retardation;