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**Systematic Review of Transition Assessments for Young Children with Autism Spectrum Disorder from Early Intervention to Special Education**

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Systematic Review of Transition Assessment from Early Intervention into Special Education

In 2019, there were 773,595 children aged 3 through 5 in the United States being served under Individuals with Disabilities Education Act (IDEA). This number represented 6.6% of the resident population aged 3 through 5. Of the disability categories included, 10.8% or 83,548 were diagnosed with ASD (autism spectrum disorder) and 6.7% or 51,830 children were receiving early intervention services (U.S. Department of Education, 2019).

The overwhelming prevalence of ASD has resulted in organized efforts to understand how to assess and provide effective early interventions for children with ASD (Lord et al., 2005). Although Special Education is far from reaching a consensus on how to define the parameters of intensive early intervention, there is general agreement that programs that include the use of Applied Behavior Analysis (ABA) methodology, have significant parent and family involvement, and have competent clinicians overseeing programs result in substantive short- and long-term effects on children’s cognition, social-emotional development, school progress, and antisocial behavior (Barnett, 2011; Dawson et al., 2009).

Historically, intensive early intervention has been provided daily in a one-on-one instructional format within the child’s home (Akmanoglu-Uludag & Batu, 2005; Leaf & McEachin, 1999; Lovaas, 1987). Michigan's Autism Insurance Reform legislation went into effect on October 15, 2012. For-profit, commercial, HMO, and non-profit health insurance companies regulated by the state of Michigan are mandated to provide an autism benefit to its insured members covering services related to the diagnosis and treatment of ASD (The Nonprofit Health Care Corporation Reform Act, 1980). This legislation has increased the number young children receiving early intervention in a clinical setting. Regardless of the location, early intensive intervention is individualized, includes continual progress monitoring, and rapid
program modification as the child acquires skills. The parameters of early intervention (i.e., methodology, intensity, individualization, and level of support) differ from what children will receive in a general or special education classroom.

In a classroom, there are higher teacher-to-student ratios and activities, and routines are not individualized to each student. Students are expected to engage in routines and activities (e.g., lunch, recess, gym class, field trips) that may have not been part of instructional programming during early intervention. As a result of these drastic changes from early intervention, students with ASD often demonstrate difficulties following directions in classrooms (Rimm-Kaufman & Pianta, 2000). The environmental arrangement and change in expectations between early intervention and school creates a gap that often exists between evidence-based practices and school practices (Wesley & Buysse, 2003). This is a multi-faceted problem that exists in early intervention, the transition process, and in special and general education. It is possible that early intervention providers (e.g., Board Certified Behavior Analysts, BCBA) are not assessing and teaching skills and behaviors necessary for students to learn in a classroom format. These behaviors include independent toileting, following teacher instructions in a group format, and following classroom expectations (Kemp & Carter, 2000; Janus et al., 2007). If a student is unable to engage in these behaviors independently (or with minimal support) it will greatly interfere with their success in the classroom and ability to access the general education curriculum and peers (Starr et al., 2016). All these factors make the transition from early intervention to school a stressful process for early interventionist, teachers, and parents.

It is possible that a transition assessment could provide structure during the transition from early intervention into the school setting and reduce stress on stakeholders. The Division on
Career Development and Transition of the Council for Exceptional Children defines transition assessment as:

An ongoing process of collecting data on the individual’s needs, preferences, and interests as they relate to the demands of current and future working, educational, living, and personal and social environments. Assessment data serve as the common thread in the transition process and form the basis for defining goals and services to be included in the Individualized Education Program (Sitlington et al., 1997, pp. 70-71).

In other words, transition assessments play a pivotal role in determining target behaviors that need to be taught, target behaviors that need to be decreased and interventions that will best support the child in the new environment. A transition assessment could be used prior, during, and after the child transitions into kindergarten. Specifically, early intervention providers (e.g., Board Certified Behavior Analysts, early childhood special education teachers) could use the transition assessment to select and teach specific behaviors (e.g., attending and learning in a group setting, eating at a lunch table with peers). During the transition, the assessment could help parents understand and navigate the changes they will encounter from early intervention to school and allow teachers to identify Individual Education Plan (IEP) annual goals and short-term objectives and supports and interventions. An objective assessment that directly measures specific skills would allow early intervention providers and kindergarten staff to proactively identify the resources necessary for the student to be successful in a classroom.

The primary purpose of the current study was to conduct a systematic literature review on peer-reviewed kindergarten transition assessments for young children with autism who are transitioning from early intervention into special or general education. The second purpose of the study was to assess published, peer-reviewed transition assessments and utilize a systematic
search and coding protocol. Transition assessments were evaluated to determine if the data obtained in the assessment were used in a dynamic manner (i.e., to aid in the development and modification of student’s instructional targets or select intervention).

Methods

Search Strategy

A four-step model for locating studies was used in the present investigation. First, researchers identified the search criteria (i.e., keyword descriptors) and databases that would be used to conduct the literature review. Searches were undertaken using a combination of the following descriptors: developmental disabilities AND autism AND school transition. Publications were filtered up to the year 2019 in order to index both recent and former transition practices and were limited to peer-reviewed articles that were published in English.

Second, descriptors were searched in each of the following three databases: PsycINFO, ProQuest Research Library, and Eric ProQuest. Each researcher was assigned a database to review. Each researcher entered the keyword descriptors into the database and a list of articles were populated. Third, a screening was conducted to determine which articles met inclusion criteria. The title and abstract of each article were read to determine if the article met inclusion criteria. An article was excluded if it did not use an assessment or did not include students with disabilities. Fourth, the reference list of the articles that met criteria were manually reviewed to identify additional articles that might meet criteria. Possible articles were then located and included into the search if the article met inclusion criteria. An initial search of PsycINFO, Eric ProQuest and ProQuest Research Library yielded 340, 153, and 56 results respectively for a total
of 549 articles. After narrowing the search to peer reviewed articles, 412 articles were included for review.

**Inclusion and exclusion criterion**

For an article to be included in the study five inclusion criteria were used: (1) the article was a peer reviewed published journal article, (2) an assessment was administered, (3) the transition was from early intervention to kindergarten, (4) participants included in the study were between the ages 3-5, and (5) the article was written in English. An assessment was defined as any tool used to measure a child’s skill level across a variety of benchmark and/or skill deficit areas for student with disabilities.

Studies were excluded from the review if (1) the study focused on vocational transitions (high school, college or employment transitions), (2) the study utilized parent and teacher perception rather than a measure of student behavior, or (3) neurotypical students were the only participants in the study. Although there is valid information to be extracted from teacher and parent views, the purpose of this study was to determine assessments that are used to assess children’s skills prior, during and after the transition to kindergarten. Studies were excluded if the focus involved employment, culture, adulthood or the article was written in a language other than English as all of these topics falls out of the scope of the study.

**Interobserver Agreement**

Interobserver agreement (IOA) was conducted across three timepoints during the search strategy. After inclusion criteria were applied, a list of articles was generated for each database and reviewed by each individual researcher. For the first round of interobserver agreement, each researcher reviewed 30% of articles of a database not initially assigned to them to determine inclusion criteria. An agreement was defined as two observers concluding that an article should
or should not be included. A disagreement was defined when one interobserver concluded an article should be included, while another observer concluded it should be excluded. Interobserver agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. Interobserver agreement for the first round of IOA was 98%. Disagreements were reviewed by all three authors in order to determine which articles met inclusion criteria. Following the first round of interobserver agreement, five articles met inclusion criteria.

Next, the references of each of the five articles were manually searched to determine if any additional articles met inclusion criteria. One additional article was identified for a total of six articles. Interobserver agreement was conducted for 30% of the references from the secondary search, resulting in one disagreement (IOA was 94%) which was reviewed by the three authors and a determination was made.

Lastly, IOA was conducted a third time during the coding of articles. This process was completed across two stages. During the first stage, each article was individually reviewed by each of the researchers to identify and code assessments across the following six categories: citation, standardization, direct or indirect, indirect type, assessment timeline and assessment utilization. During the second stage, the research team reviewed all six articles together to determine interrater reliability. Overall IOA was 94% and all disagreements were discussed, and a conclusion determined by carefully reviewing operational definition of each code.

Results

The initial search using the keywords listed was completed in three databases: PsyInfo, Eric ProQuest, and ProQuest Research and yielded 340, 153, and 56, articles respectively. The search was refined to include only peer reviewed articles which narrowed the number of articles
to 250, 116, and 46 respectively. Of those 412 articles, six articles met inclusion criteria. The search strategy is outlined in figure 1.

The six articles were read and the number and name of all the assessments used in each article was determined. Within the six articles, 31 assessments were administered. There were 12 duplications, yielding 19 assessments for analysis. Of the 19 assessments identified, 95% (n = 18) reported a citation which allowed assessment characteristics to be extracted. Each assessment was categorized and coded against five different domains: type of assessment, whether it was direct or indirect, the type of indirect assessment used, when the assessment was administered and what the program did with the results. These domains were selected based on the overlapping features of each of the assessments analyzed. To better understand how early intensive programs were using assessments, it was necessary to explore when, how, and why assessments were being utilized. Table 1 summaries the data extracted from each article.

**Type of Assessment**

**Standardization.** An assessment was classified as standardized if it was norm-referenced. Norm-referenced measures compares a person’s knowledge or skills to the knowledge or skills of the norm group. The composition of the norm group is often a nationally representative sample of several thousand students tested under the same context (e.g., age, grade). An assessment was classified as not standardized if the assessment was criterion-referenced, involved a curriculum-based measure, or used an informal method which was defined as assessing a student’s grade level, developmental diagnosis, work samples, task analysis, portfolio assessment, and/or reported IOA on the development of the assessment. Figure 2 depicts the results of these findings. Forty-two percent (n = 8) were standardized, 26%
percent (n = 5) of the assessments were not standardized, and 32% (n = 6) were not reported or could not be determined.

**Direct vs Indirect**

**Measurement.** Each assessment was categorized as a direct or indirect measure. An assessment was scored as a direct measure if a data collector recorded a student’s behavior by being physically present and directly observing the behavior (Cooper, Heron, & Heward, 2007). An assessment was defined as an indirect measure if it involved interviews, rating scores, checklists, and/or verbal reports. Sixty-eight percent (n = 13) were indirect measures and 32% (n = 6) were direct measures.

**Indirect Type**

**Category.** Indirect measures were further analyzed to determine the type of indirect measure used. Figure 3 depicts these findings. Thirty-one percent (n = 4) utilized rating scales, 31% (n = 4) utilized questionnaires, 15% (n = 2) used checklists, 15% (n = 2) did not report or could not be determined (e.g., assessment could not be located), and 8% (n = 1) conducted interviews.

**Assessment Timeline**

**Schedule.** The time point at which each assessment was administered was determined. Each assessment was scored as occurring: (1) pre-transition; (2) post-transition, (3) pre-and-post or (4) not reported. An assessment was scored as pre-transition if the assessment was administered, and data were collected prior to the transition to kindergarten. An assessment was scored as post-transition is the assessment was administered and data was collected following the transition to kindergarten or assessed the level of success in the classroom. An assessment was scored as pre- and-post-transition if the assessment was administered, and data were collected
prior to and after the transition to kindergarten. Thirty-seven percent (n = 7) of assessments were administered pre-transition; 37% (n = 7) were administered pre-and-post transition, 10% (n = 2) were administered post transition, and 16% (n = 3) were not reported.

**Use of Assessment Results**

**Utilization.** The manner in which assessment data were used during the transition was determined. Each assessment was scored as (1) instructional or (2) descriptive. An assessment was scored as instructional if the assessments results were used to modify instruction either prior to the transition or once the child was in the new classroom setting. For example, research by Le Ager and Shapiro (1995) modified instruction using Ecobehavioral System for Complex Assessments of Preschool Environments (ESCAPE) and Assessment Code/Checklist for Evaluating Survival Skills (ACCESS). They quantified differences between environments and were able to successfully adjust intervention decisions and modified instruction. Conversely, an assessment was scored as being used in a descriptive manner if assessment data were used in a comparative manner or to describe a student’s transition. For example, Welchons and McIntyre (2015) used the Family Experiences and Involvement in Transition (FEIT) and the Student–Teacher Relationship Scale (STRS), among other assessments, to determine predictors of socio-behavioral kindergarten outcomes. Their analyses demonstrated correlations between parent/teacher-reported child problem behavior in preschool and child social and behavioral outcomes in kindergarten, however, did not use these finding to modify instruction either pre or pose the transition. Additionally, McIntyre, Blaker, and Baker (2006) utilized measures such as the Vineland Adaptive Behavior Scales and the Social Skills Rating System Teacher form (SSRS-T) to assess adaptation to school. Their analyses identified higher intelligence quotient (IQ) and adaptive behavior predicted a more positive adaptation to school. However, their
findings were not used to inform or modify instruction either prior to or following the transition. In other words, while some articles made substantial claims in predicting student outcomes, very few used it to identify deficits and then subsequently target and teach those deficits. More specifically, seventy-nine percent (n = 15) of assessments used data in a descriptive manner, whereas 21% percent (n = 4) modified instruction and utilized the results in an instructional manner.

**Discussion**

The purpose of the current review was to determine the number of peer-reviewed transition assessments for young children with ASD who are transitioning from early intervention into special or general education. Of the 411 articles reviewed, six articles met inclusion criteria, which yielded 20 assessments for analysis. Each assessment was analyzed to determine the type of assessment, when the assessment was given, and how assessment data was utilized. Many of the assessments were indirect measures, given prior to the transition to school and were used in a descriptive manner.

These results are noteworthy in that they suggest that assessments used during the transition from early intervention to special or general education are not being used in a dynamic manner to prepare students for the transition to school or after the transition occurs, which contrasts with data-based decisions making and best practice (Akers et al., 2015a, 2015b; Division for Early Childhood, 2014). These findings might suggest that early interventionalists and educators need a transition assessment to aid in decision making during this transition and might explain why people involved in this process often describe it as challenging and stressful.

Ideally, early interventionalists and educators could use a transition assessment to make decisions prior, during and after the student has transitioned from early intervention into the
school setting. In order to use assessment data in a dynamic manner to aid in selecting learning targets (e.g., early intervention targets and IEP goals and objectives), a combination of direct and indirect measures could be used. It is common practice in both settings to use direct measures which would allow student progress to be monitored objectively.

In the current study, six direct assessments were identified: (1) Ecobehavioral System for Complex Assessments of Preschool Environments (ESCAPE; Le Ager & Shapiro, 1995; Carta et al., 1990), (2) Assessment Code/Checklist for Evaluating Survival Skills (ACCESS; Le Ager & Shapiro, 1995; Carta et al., 1990), (3) Independent Seatwork Activity Intervention Checklist (Le Ager & Shapiro, 1995), (4) Procedural Checklist Classroom Survival Skills for Independent Work (Le Ager & Shapiro, 1995), (5) The Stanford-Binet (Thorndike et al., 1986), and (6) The delay of gratification task (Vaughn et al., 1984). The Stanford-Binet is a traditional intelligence test designed to assess an individual’s intelligence quotient (IQ) which would be inappropriate to use to select instructional targets or inform the level of support needed. The Stanford–Binet Intelligence is a test of general intellectual ability, which is widely used both for clinical and research purposes (Coolican et al., 2008). Although it’s intended to represent a hierarchical structure of intelligence, the test is not generalizable to all populations including students diagnosed on the spectrum. Holdnack and Weiss (2006) discovered an overrepresentation of African American in special education due to the tests inability to incorporate culturally fair and representative test revisions. Additionally, Coolican, Bryson, and Zwaigenbaum (2006) found that using the Stanford-Binet on students with ASD resulted in an inaccurate representation of student aptitude. The article recommended using an abbreviated battery version with the understanding that the abbreviated version could overestimate overall student ability as well.
The delay of gratification task (Vaughn et al., 1984) measures a student’s latency to touch to a preferred item when told a more preferred item is available after a delay. This is a measure of impulse control and a student’s ability to tolerate delayed gratification. It is possible the results of this assessment could inform instructional programing pre or post transition, but it would be difficult to determine exactly what the assessment would be measuring in young children with ASD. For example, if a short latency was observed, it would be difficult to determine if the student’s responding was a function of deficits in language, motivation, or impulse control and additional assessment would be warranted. The Independent Seatwork Activity Intervention Checklist (Le Ager & Shapiro, 1995) measures both student and teacher behavior by measuring the duration of activities, the number of students participating in the activity, the number of instructions given prior to independent work, and the number of group and individual prompts given during independent work. Although this includes a direct measure of student behavior, data collections procedures would need to be slightly modified to include direct measures for individual students. This information could be used to determine how long a student can engage in independent work without prompts. Although all three assessments involve direct measures of student behavior, they fail to comprehensively measure a broad range of skills that a student needs to be successful in a classroom setting.

The three assessments that were direct and used for instructional planning were the Procedural Checklist Classroom Survival Skills for Independent Work (Le Ager & Shapiro, 1995), Ecobehavioral System for the Complex Assessment of Preschool Environments (ESCAPE; Le Ager & Shapiro, 1995; Carta et al., 1990) and Assessment Code/Checklist for the Evaluation of Survival Skills (ACCESS; Le Ager & Shapiro, 1995; Carta et al., 1990). Two of these assessments incorporate practices of Ecobehavioral Analysis which is an approach to
measuring environments that describes the ecology (i.e., topographical features as well as the persons within it) and examines the interactions that occur between the ecology and student behaviors (Carta et al., 1990). The rationale for this type of analysis is that student outcomes are primarily determined by the interactions the student has with the environment and the people in it. Compared with assessments that only measure students’ performance and ability, the Ecobehavioral approach focuses on how the environment fosters or hinders behaviors and learning to take place (Carta et al., 1990).

The Ecobehavioral System for the Complex Assessment of Preschool Environments (ESCAPE) measures several aspects of the classroom ecology, teacher behavior, and student behavior. Data derived from this assessment are typically described in molar or molecular analyses. A molar analysis is the determination of the average percentage of intervals recorded across observation sessions for one particular variable for one child or group of children. While a molecular analysis is the determination of the conditional probability of a specific variable given the occurrence of one or more other variables (Carta et al., 1990). For example, if preschoolers are more actively engaged in fine motor activities than transitions, then practitioners can use that data to find creative ways to increase reinforcement during transitions thus increasing student engagement. By examining what typical days are like for children in various types of school settings, practitioners can better understand why and how students with disabilities especially those diagnosed with ASD, which can inform instruction in both early intervention and the classroom.

The Assessment Code/Checklist for the Evaluation of Survival Skills (ACCESS) was developed to allow an enhanced focus on specific behaviors that are deemed important for success in kindergarten. This assessment focused on group instruction, independent seatwork,
and within class transitions. These three domains have been previously identified as critical for successful functioning in kindergarten classrooms by teachers (Carta et al., 1990; Quintero & McIntyre, 2011). Students were directly measured in one of three domain areas during 5-minute observation blocks to assess student’s skill level. When students were found to struggle in independent seatwork, instruction was subsequently modified. Students were taught to self-assess independent seatwork and teachers were taught to reduce prompts to low rates (which is typical of regular kindergarten settings).

The methodological approaches used in both ESCAPE and ACCESS are examples of direct observational systems that can be used to analyze the broad structural differences between early intervention and kindergarten and can be used to modify instruction pre and post the transition to kindergarten. Based on the available research to date, it appears ESCAPE and ACCESS are not commonly used in peer-reviewed research during the transition from early intervention to school. It may be the case that these are frequently used by early interventionalists and educators and not in peer-reviewed research. A possible limitation of ESCAPE and ACCESS is that they require intensive time, collaboration and resources (McIntyre, Eckert, Fiese, et al. 2010; Quintero & McIntyre, 2011; Welchons & McIntyre, 2015; Fontil et al., 2019).

Nevertheless, ESCAPE and ACCESS are direct assessments that provide a theoretical framework for a potentially comprehensive transition assessment. A comprehensive transition to kindergarten assessment could include the following five criteria: (1) objective, (2) direct measures of student behavior, (3) cost-and-time efficient, (4) easily inform instructional planning, and (5) leads to objective instructional decisions making.
Given the limited results found in the current study, there are many opportunities for future research. Educators and school personnel are most likely using some form of assessment tool or measure to make educational decisions when children transition from early intervention into the school setting. Future research could survey early interventionalists and schools across the county to determine which assessment tools are being used and how the data collected from these tools are used. Once assessment measures are identified, researchers could investigate the validity and reliability of these assessments and determine their usefulness in objective decision making. This type of information would be invaluable in the development of a comprehensive transition assessment.

One major limitation of the current study is that only peer-reviewed articles were included. There are likely several transition assessments that interventionalists and schools use to guide instructional programming for young children for ASD. For example, The Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP; Sundberg, 2008) is an assessment that contains 170 measurable learning and language milestones that are sequenced across three developmental levels. Level 1 includes skills that typically developing children demonstrate by 18 mos., level 2 are skills typically observed by 30 mos., and level 3 are skills typically observed by 48 mos. The VB-MAPP comprises three sub-assessment including Milestones, Barriers and a Transition Assessment. The Milestone assessment include direct measures of a student’s language, play, social, imitation, matching-to-sample, and group skills. The Barriers Assessment is a rating scale of 24 common learning and language acquisition barriers faced by children with ASD or other developmental disabilities. The transition assessment is a rating scale of 18 areas that can help identify whether a child is making meaningful progress and has acquired the skills necessary for learning in a less restrictive educational environment (e.g., kindergarten). The VB-
MAPP is commonly used in early intervention centers that implement ABA to monitor student progress and often times are required by insurances companies to demonstrate child progress. Although commonly used, Montallana et al. (2019) demonstrated substantial variability in the reliability of the milestones assessment when used by different clinicians on the same student. The low reliability was likely due to the lack of operational definition of behaviors being measured in the assessment. Currently, it is not clear how reliable the transition assessments are in making instructional decisions and how those data are used by interventionalists or schools, if used at all. The VB-MAPP transition assessment is one example of an assessment that exists, and it is likely that schools use similar assessments or develop transition assessments within their own districts to aid in the transition process. Although these assessments undoubtedly help stakeholders make decisions, without being researched or validated it is difficult to determine how these types of assessments effect instructional programming which ultimately effects a student’s success in the classroom.

Future researchers are encouraged to determine what transition assessments are being used across the country and how these data are used in the transition process. This information could be used to develop an objective, direct transition assessment to aid in instructional planning pre-and post-a student’s transition to kindergarten.
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