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Quality of the Transition Component of the IEP for High School Students With Autism

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Abstract

The present study examined the transition component of the Individualized Education Program for 62 secondary students with autism. Plans were coded using a rubric adapted from Indicator 13 of the Individuals with Disabilities Education Improvement Act. Findings indicated a mean plan score of 10.5 out of 20.0, with a range of 3.0 to 20.0. Strengths were noted in Transition Services, with Course of Study and Transition Assessment as areas of relative need. Student characteristics—including adaptive behavior, IQ, and self-determination—were associated with components of transition plan quality. Plan quality differences were found based on diploma status and the quality of the school environment. Implications for supporting educators in writing and implementing quality transition planning are discussed.

Keywords

high school, Autism, transition assessment or planning

Planning for the transition from high school to adult life for students with autism is critical for success in adulthood. Postschool outcomes for adults with autism continue to lag behind those of adults with other disabilities (Taylor & Seltzer, 2011). The National Autism Indicators report revealed that 37% of young adults with autism in their early 20s were neither working nor enrolled in postsecondary education (Roux et al., 2015). Young adults with autism also earn less money, work fewer hours, and are less likely to live independently and engage in their community than peers with other disabilities (Roux et al., 2015). Lipscomb et al. (2017) found that, relative to other high school students with disabilities, students with autism had more trouble completing daily living activities, were less self-determined, had fewer planned activities and social engagement with friends, and were less likely to have paid work outside of school. These findings support the need to improve both in-school and postschool outcomes for youth with autism. One essential requirement to achieving positive adult outcomes is to provide quality and systematic transition programming during high school (Wehman et al., 2014).

Compliance With the Individuals with Disabilities Education Improvement Act (IDEIA) Transition Requirements

Transition planning for students with disabilities ages 16 and above has been universally mandated in the United States since the 1990 reauthorization of the Individuals with Disabilities Education Act (IDEA), with modifications of requirements occurring in 1997 and 2004. The Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 included transition requirements for postschool goals in the areas of education/training, employment, and independent living (if necessary); age-appropriate transition assessments based on individual needs, strengths, and interests; transition services, including course of study; and annual Individualized Education Program (IEP) goals related to the student's transition service needs (Test & Fowler, 2018). Although the format of the requirements may vary across state and school district IEP documents, these core requirements are regulated by federal law. Since the initial transition service mandate in 1990, researchers have been investigating the compliance of the transition component of the IEP with IDEIA requirements (e.g., Everson et al., 2001; Grigal et al., 1997). *Compliance* refers to the extent that IEPs contain the required components of

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transition planning as mandated by IDEIA. Although the metric used to assess plan compliance varies across studies and the majority of published studies are older, thus assessing compliance with 1990 and 1997 IDEA requirements, most indicate a high rate of compliance (e.g., Everson et al., 2001; Grigal et al., 1997). Since 2004, school districts and local education agencies (LEAs) are also required to report to the Office of Special Education Programs (OSEP), through their State Performance Plans and Annual Performance Reports, the extent to which they are complying with the transition service mandate. The most recent 2020 report indicates that the mean compliance rate across states is 89%, with a range of 17% to 100% (U.S. Department of Education, Office of Special Education and Rehabilitative Services, Office of Special Education Programs [OSEP], 2020).

Relationship Between Compliance and Quality Transition Programming/Postschool Outcomes

Although compliance with the transition requirements of IDEIA (2004) does not guarantee successful outcomes in adulthood or quality programming in high school, it is a necessary first step. The IEP can provide the structure and planning process to increase the likelihood that secondary students with disabilities will leave high school better prepared to access and engage in meaningful activities in adulthood (Doren et al., 2012). Indeed, some research has indicated a positive relationship between transition plan compliance with IDEIA transition requirements and effective transition practices and postschool outcomes. Landmark and Zhang (2012) explored the relationship between transition plan compliance and effective practices evident in the IEP. They found a moderate positive correlation, indicating that as the level of compliance increases, so does the number of transition practices evident in the IEP. Erickson et al. (2014) found that State Performance Plan Indicator 13 compliance was positively correlated with postsecondary education and training, but not with employment. Results indicated that LEA compliance data on 2,123 student IEPs was associated with the percentage of graduates with IEPs who completed a semester of college or a non-college training program. Although this study provides some evidence for the relationship between transition plan compliance and positive postschool outcomes, it is limited in that the IEPs reviewed for the Indicator 13 data were not necessarily from the same students as the postschool outcomes. The data set represented only students with IEP transition compliance review dates that corresponded with the graduates' high school years with IEPs, rather than linking student-level IEP transition compliance with their graduation outcomes.

Although IEPs may meet the legal transition requirement of IDEIA (2004), it does not mean they are of high quality. Many of the rubrics used to evaluate transition plan compliance consist of yes/no ratings and do not offer any real measure of component quality (e.g., Indicator 13 Checklist). There is evidence, however, that quality transition planning is a predictor of improved postschool outcomes for students with disabilities, including students with autism (Mazzotti et al., 2021; Test et al., 2009). Quality transition planning starts with a quality transition plan. Indeed, transition plan quality is a malleable factor that can impact outcomes. Thus, investigations examining the extent to which the transition component of the IEP is both compliant and reflects best practices are needed.

Students With Autism and Transition Planning

To date, the majority of studies examining transition plan compliance and quality have been conducted with a heterogeneous group of students with IEPs. Students with autism, if included, often only make up a small portion of the sample (e.g., Everson et al., 2001; Finn & Kohler, 2009; Grigal et al., 1997; Landmark & Zhang, 2012). This lack of representation of transition-age youth with autism is consistent with results from a recent congressional report, which concluded that only 2% of research related to autism has focused on transition and adult issues (U.S. Department of Health and Human Services, 2017).

Data that do exist for students with autism reveal that their IEPs often fail to integrate essential transition skills and fail to have IEP goals related to critical adult domains (Wehman et al., 2014). In an attempt to empirically assess the quality of transition planning for a small cohort of high school students with autism and the relationship to postschool outcomes, Ruble et al. (2019) developed the Transition Planning Quality Scale. Results revealed a positive relationship between transition plan quality and progress toward IEP and postsecondary goals. However, in this study, transition plan quality was measured indirectly based on parent report. Thus, although it is positive to see the relationship between plan quality and postsecondary goals for students with autism, it is important to examine the components of the plan more objectively for quality.

Some studies have begun to examine the variance in transition plan compliance and quality based on student (disability, race/ethnicity, gender) and educational characteristics (diploma type). Landmark and Zhang (2012) found that a student's disability and race/ethnicity were related to transition plan compliance and effective transition practices evident in the IEP. Specifically, being a Black student decreased the likelihood of full compliance with transition requirements related to the IEP team. The IEPs of Black students also had less evidence of family involvement and employment preparation. Latinx students had decreased likelihood of full compliance with the annual goal

requirement of the transition plan. Powers et al. (2005) found that students with developmental disabilities were significantly less likely to have their interests and employment goals written in the transition component of the IEP than students with other disabilities (e.g., learning disabilities, physical disabilities, emotional disturbance). In addition, findings indicated that postsecondary education options were considered much more frequently for standard diploma-bound students. In contrast, vocational training goals were more common among the transition component of the IEP for students working toward a modified diploma. No differences in transition plan quality were found based on gender.

Although the study by Powers et al. (2005) examined plan quality for students with developmental disabilities (i.e., intellectual disabilities, autism, multiple disabilities), the group comprised only 26.5% of their larger sample and was based on IDEA (1997) transition plan requirements, which differ from IDEIA (2004) requirements (e.g., no requirement of postschool goals and annual goals linked to transition services). Landmark and Zhang's (2012) sample included only 7.6% of students with autism. There remains a need to examine transition plan quality based on IDEIA requirements for students with autism. Also, examining student and educational variables for this population is critical to understanding the relationship to the quality of transition plans. The present study aimed to examine transition plan quality for a sample of transition-age students with autism. The sample was part of a larger study examining evidence-based practices for students with autism. Questions that guided the investigation were as follows: (a) What is the quality of the transition component of the IEP for transition-age students with autism? (b) What student and educational variables are associated with transition plan quality? (c) Are there differences between transition plan quality for students with autism seeking a standard high school diploma versus a modified diploma?

Method

This study used a subset of data from students in schools randomized to the comparison group (services as usual [SAU]) enrolled in a large cluster randomized control trial (CRCT) conducted by the Center on Secondary Education for Students with Autism (CSESA; Hume et al., 2021) from August 2014 to June 2017. Only data from students enrolled in SAU, as opposed to intervention schools, were used to control for the possible effects of the CSESA intervention on transition plan quality. Data collected included descriptive data about schools and students taken at Time 1 (pre), as well as the quality of the transition component of the IEP taken at Time 2 (post). The primary inclusion criteria for students were a primary or secondary educational classification of autism and planned school enrollment for two school years (i.e., not in their final year of high school). For the CSESA study, district administrators supported the recruitment of schools. Once a school agreed to participate, consent packets were sent home to all students meeting inclusion criteria.

Participants

The participants for the current study included a subset of 62 students from 18 different high schools across two states in the United States: 10 schools from a Southeastern state and eight schools from a West Coast state. The schools were from a mix of urban ($n = 6$), suburban ($n = 10$), and rural ($n = 2$) settings; and the percentage of students receiving free and reduced-price lunch ranged from 6.7% to 75.0% ($M = 36.7\%$, $SD = 20.5\%$). The Autism Program Environment Rating Scale (APERS; Odom et al., 2018) was used to measure program quality at each school. The APERS includes 66 items rated on a 5-point scale based on focused observations of students with autism during school hours, interviews with school staff and parents, and record reviews of IEPs and transition plans. Possible scores ranged from 1 to 5. Schools in the present study had a mean APERS score of 3.3 ($SD = 0.44$) with a range from 2.2 to 3.9.

The students were served in two different educational program pathways: students working toward a standard diploma primarily served in general education settings ($n = 34$) and students working toward a modified diploma primarily served in separate or self-contained settings ($n = 28$). These students were chosen by selecting four students from each school (i.e., two working toward standard diploma, two working toward modified diploma) with the most recently developed IEPs based on date at the time of data collection. The students were between 14 and 21 years of age ($M = 16.2$ years, $SD = 1.5$ years), and 89% of them were male. The students had a wide range of nonverbal intellectual abilities, with nonverbal IQ scores ranging from 30 to 132. The sample was racially diverse, with 53% of the sample identifying as non-White. Table 1 includes additional demographic and descriptive information about the student participants.

Procedures

The CRCT included 2 years of school and student enrollment with descriptive data collected at pretest during the fall of Year 1 (i.e., student demographics and characteristics, school demographics, program quality) and transition plan data collected at posttest during the spring of Year 2. As students could be in ninth grade at the time of enrollment in the larger CSESA study, the transition plan data were only collected at posttest, given that pretest transition plans could have been created by different educational teams (e.g., middle school team) and/or before the age 16, when

Table 1. Student and Family Demographics for the 62 Students with Autism in the Study.

Demographic information	*n*	%
Race		
Black/African American	14	22.6
Multiracial	7	11.3
White	26	41.9
Other	12	19.3
Missing	3	4.8
Ethnicity		
Hispanic/Latino	11	17.8
Non-Hispanic/Non-Latino	49	79.0
Missing	2	3.2
Household income		
< US$39,000	8	12.9
US$40,000–US$79,999	14	22.6
≥US$80,000	29	46.7
Missing	11	17.7
Maternal education/paternal education		
High school diploma/GED	10/5	16.1/8.1
Associate degree/technical degree/some college	14/9	22.6/14.4
Bachelor's or graduate degree	20/21	32.2/33.9
Missing	18/27	29.0/43.5
Measure	*M* (*SD*)	Min—max
Leiter nonverbal IQ ($n = 58$)	82.0 (27.3)	30–132
Vineland Adaptive Behavior Scale standard score ($n = 54$)	74.7 (17.4)	42–128
Social Responsiveness Scale-2 *T*-score ($n = 59$)	70.7 (11.8)	39–104

transition plans are federally mandated as part of the IEP process. It should be noted that the Southeastern state required transition planning by age 14, and the West Coast state required transition planning by age 16, which is consistent with IDEIA (2004). The descriptive data for participating students with autism in SAU schools were collected using direct assessment with students administered by project staff and parent- and teacher-completed assessments and questionnaires. The descriptive data for schools were collected from the National Center on Educational Statistics, and the APERS, a measure of program quality, was completed by project staff. The transition plan data were part of the students' IEPs collected by CSESA team members at each of the SAU schools.

Measures

Student and family demographics. Student and family demographic information was collected through a student/family demographic form sent to caregivers at the beginning of the study. Some information (i.e., race/ethnicity, gender, age) was supplemented with data from the school if demographic forms were not returned or were incomplete. The research team calculated age on September 1 of the first year of enrollment based on student birth date. There was also family demographic data about maternal and paternal education and household income from the previous tax year (see Table 1).

Student characteristics. Research staff administered the Leiter International Performance Scale–Third Edition (Leiter-3; Roid et al., 2013), a cognitive measure that provides a nonverbal IQ score, to students. Teachers completed two standardized assessments: the Social Responsiveness Scale–Second Edition (SRS-2; Constantino & Gruber, 2012) and the Vineland Adaptive Behavior Scales–Second Edition (Vineland; Sparrow et al., 2006). The SRS-2 is a 65-item rating scale that measures autism symptomatology. The total *T*-score was used for this study. The research team used the teacher report version of the Vineland, which includes three scales and nine subscales. The Adaptive Behavior Composite standard score was used for this study. Teachers also completed a measure of self-determination, the American Institutes for Research Self-Determination Scale (Wolman et al., 1994), a 24-item measure with ratings ranging from 1 (*never*) to 5 (*always*); and a measure of support needs, the Supports Intensity Scale for Children (Thompson et al., 2014), a 7-item measure of the level of support needed from 1 (*no extra support needed*) to 5 (*total support needed*). The seven items include activities across home, school, and community (e.g., activities completed as a function of living in a household; activities associated with participating in the school community; activities that assure safety and health across home, school, and community environments).

School demographics and characteristics. The research team gathered demographic data about each of the participating schools from the National Center on Educational Statistics (2014–2015 years). The data included locale, which were coded into three levels of urbanicity: urban (city-large and city-midsize); suburban (suburb-large); and rural (rural-fringe and town-fringe). Data were also collected on the percentage of students receiving free and reduced-price lunch. In addition, at the beginning of Year 1, research staff completed the APERS (Kraemer et al., 2020; Odom et al., 2018) in each school. The APERS is a 66-item rating scale with 10 domains that is scored based on observations, interviews, and record reviews. The APERS generates an overall Program Quality score between 1 and 5 based on the mean of all items. Schools with a score of 3 are considered to have minimally adequate quality (see Kraemer et al., 2020).

Transition plan quality. Researchers aimed to collect the two most recently completed IEPs for enrolled students in each of the types of educational programs (standard diploma and modified diploma) per school at the end of Year 2. We targeted the IEPs of students at the 18 SAU schools across the two states. To prepare for coding, the IEPs were reviewed for accuracy and completeness. IEPs with dates outside the expected range for post-test IEPs (i.e., not within 12 months of end of Year 2) were removed. In addition, IEPs that did not contain transition planning components because the student had not yet reached the state required age for transition planning were excluded. A total of 62 IEPs with transition components met inclusion criteria.

To analyze transition plan quality, we adapted a Transition Plan Scoring Rubric (see Figure S1 in the online supplemental materials) from the transition requirements of the IEP outlined in Indicator 13 required by IDEIA (2004; Test & Fowler, 2018) and a quality rubric designed by the Rhode Island Department of Education Indicator 13 Scoring Rubric (2013). As defined by Indicator 13, the federal IEP reporting requirements for transition-age students are as follows:

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

In accordance with IDEIA (2004), the Transition Plan Scoring Rubric utilized in the present study included the following areas/domains: Measurable Postsecondary Goals, Transition Assessment, Transition Services, Course of Study, Connection to Annual IEP Goals, and a Total Plan Score. Outside Agency Involvement and Student Invitation to attend the IEP meeting were ultimately discarded and not included in the rubric due to a lack of documentation submitted for review by school IEP teams in these areas. Letters of invitation to participate in the IEP meeting and IEP signature pages were not submitted to the research team by the participating schools; thus, it could not be determined by review of the submitted transition planning documents if students and/or key agencies were invited or attended the meeting.

Each of the five categories/domains included in the rubric was scored on a 5-point Likert-type scale ranging from 0 (*nonexistent features*) to 4 (*high-quality features*). To receive a score of 4 in the category of Measurable Postsecondary Goals, the transition component of the IEP (a) included measurable goals for postsecondary employment, education or training, and independent living, and (b) assessment data or the present level of performance provided a basis for the goals. A score of 4 in the area of Transition Assessment indicated that assessment information was taken from at least two documented sources (one of which included student participation) and included a minimum of three transition skill areas. A score of 4 in the category of Transition Services indicated that the IEP described services that were a coordinated set of activities that support the student in achieving their postschool goals, and there were a minimum of two services listed for each postsecondary goal. A score of 4 for Course of Study indicated that the plan contained a multi-year course of study that was aligned with the student's postschool goals and included electives aligned with postschool goals. For the Annual IEP Goals item, there needed to be a minimum of two annual goals related to the student's postschool goals, and all annual goals on the IEP needed to be supported by quantitative data. The Total Plan Score was the sum of all scores given in each category, with a total possible score of 20. The complete Transition Plan Scoring Rubric is available for review in Supplemental Materials (see Figure S1).

The CSESA team selected two researchers from each regional site and trained them to be coders. One inter-rater coder was selected to establish reliability across all site coders. The training process included the following steps: (a) review of the Transition Plan Scoring Rubric with the full coding team led by the inter-rater coder (approximately 2 hr); (b) two cycles of practice coding of two transition plans followed by discussion with the full coding team to resolve discrepancies for calibration (approximately 2 hr); and (c) two cycles of coding two transition plans with master codes from the inter-rater coder to establish reliability. A research assistant compiled the scores so that the inter-rater coder would be blind to the site coders. Inter-rater agreement was

Table 2. Transition Plan Quality Domains Inter-Rater Agreement.

Domain	Intraclass correlation	95% confidence interval	
		Lower bound	Upper bound
Measurable Postsecondary Goals	0.47	0.20	0.68
Transition Assessment	0.73	0.54	0.85
Transition Services	0.55	0.29	0.73
Course of Study	0.51	0.24	0.71
Annual Goals	0.61	0.37	0.77
Total	0.75	0.57	0.86

Table 3. Transition Plan Scores by Domain.

Coding scores	Postsecondary Goals %	Transition Assessment %	Transition Services %	Course of Study %	Annual IEP Goals %
0	6.3	7.9	0	11.1	4.8
1	23.8	58.7	1.6	58.7	34.9
2	34.9	17.5	20.6	19.0	34.9
3	12.7	7.9	52.4	3.2	11.1
4	22.2	7.9	25.4	7.9	14.3

Note. IEP = Individualized Education Program.

calculated using double-coding for 25% of the entire sample of IEPs. Intraclass correlation (ICC) estimates and their 95% confidence intervals (CIs) were calculated using the R package inter-rater reliability (IRR) based on a single value absolute-agreement, two-way mixed-effects model. For the total score, there was good agreement (ICC = 0.75, 95% CI = [.57, .86]; Cicchetti, 1994; Koo & Li, 2016). The five domains demonstrated moderate reliability (see Table 2).

Data Analysis

Data analyses were performed in SPSS Version 27 and R. A repeated-measures multivariate analysis of variance (MANOVA) was performed to examine the transition plan quality profile in transition-age youth with autism to identify relative strengths and weaknesses. Spearman's rank-order correlations were conducted to examine associations among transition plan quality scores and student and education statistics. Finally, general linear models were used to examine transition plan quality scores between diploma types and examine school quality as a moderator of the relationship between transition plan quality and diploma type. Effect sizes are reported as partial eta squares as 0.01 (small), 0.09 (medium), and 0.25 (large; Cohen et al., 2003).

Results

Transition Plan Quality Profile

The Total Plan Scores for the 62 IEPs with transition components ranged from 3 to 20, with a mean score of 10.05. The quality of items varied extensively across the plans with overall strengths in the Transition Services area of the plans and weaknesses in the Course of Study area of the plans. Table 3 shows the percentage of scores in each area/domain.

The overall repeated-measures MANOVA was statistically significant, $F(4, 58) = 49.35, p < .001$, $\eta_p^2 = .78$, suggesting that there were within-individual differences among the transition plan quality domain scores. The Transition Services domain was rated the highest ($M = 3.02$, $SD = 0.74$), followed by Measureable Postsecondary Goals ($M = 2.21$, $SD = 1.23$), Annual Goals ($M = 1.92$, $SD = 1.09$), Transition Assessment ($M = 1.50$, $SD = 1.04$), and Course of Study ($M = 1.37$, $SD = 1.01$). Pairwise comparisons showed that the Transition Services domain was significantly higher than all the domains. The Annual Goals average did not significantly differ from the Measurable Postsecondary Goals or Transition Assessment domains. The Course of Study domain was significantly lower than all other domains. Table 4 shows the pairwise comparisons table.

Student Associations With Transition Plan Quality

To examine the association between student characteristics and transition plan quality, Spearman's correlations were run. There were no significant correlations among student characteristics with the Total Plan Score. However, there were domain areas that were significantly associated with

Table 4. Pairwise Comparisons Between Transition Plan Domains.

Domain (I)	Domain (J)	Mean difference (I–J)	*SE*	Sig.[a]	95% Confidence Interval for difference[a]	
					Lower bound	Upper bound
Postsecondary Goals	Transition Assessment	0.71	0.11	< 0.001	0.38	1.04
	Transition Services	−0.81	0.13	< 0.001	−1.19	−0.42
	Course of Study	0.84	0.12	< 0.001	0.48	1.20
	Annual Goals	0.29	0.17	0.89	−0.20	0.78
Transition Assessment	Transition Services	−1.52	0.12	< 0.001	−1.88	−1.16
	Course of Study	0.13	0.11	1.000	−0.20	0.45
	Annual Goals	−0.42	0.17	0.137	−0.90	0.06
Transition Services	Course of Study	1.65	0.14	< 0.001	1.25	2.04
	Annual Goals	1.10	0.15	< 0.001	0.66	1.53
Course of Study	Annual Goals	−0.55	0.7	0.02	−1.04	−0.06

[a]Adjustment for multiple comparisons: Bonferroni.

student-level characteristics. All Spearman's correlation probabilities were corrected for multiple comparisons using the Benjamini and Hochberg (1995) false discovery rate procedure. The Postsecondary Goals domain was significantly associated with *adaptive behavior,* $r = .43$, 95% CI = [.16, .61], Benjamini–Hochberg corrected $p = .02$. In addition, the Postsecondary Goals domain showed significant relationships with *IQ,* $r = .31$ 95% CI = [.05, .52], Benjamini–Hochberg corrected $p = .05$; *paternal education,* $r = .37$ 95% CI = [.06, .37], Benjamini–Hochberg corrected $p = .05$; *self-determination knowledge,* $r = .28$ 95% CI = [.03, .28], Benjamini–Hochberg corrected $p = .05$; and *supports intensities,* $r = -.35$ 95% CI = [−.57, −.37], Benjamini–Hochberg corrected $p = .05$. Students with more educated fathers, higher IQ, higher adaptive behavior, and higher self-determination scores had IEPs with higher quality postsecondary goals. Students who needed more supports, as measured by the Supports Intensity Scale, had lower quality Postsecondary Goals. The Course of Study domain was significantly associated with *age,* $r = -.39$ 95% CI = [−.58, −.15.], Benjamini–Hochberg corrected $p = .01$. Students with autism who were younger had higher quality Course of Study items on their IEPs. Table 5 includes the full correlation table.

Program Differences: Standard vs. Modified Diploma

When transition plan quality was examined by student diploma status, it was found that students on the standard diploma track had a significantly higher transition plan Total Score ($M = 11.03$) than students on the modified diploma track ($M = 8.79$, $B = 2.24$, $SE = 0.93$, 95% CI = [0.38, 4.11], $\eta_p^2 = .09$). Table 6 includes the descriptive statistics. There were also significant program differences across transition plan quality domains, $F(4, 57) = 3.49$, $p = .013$, $\eta_p^2 = .20$. Specifically, students on the standard diploma track had higher scores on the Postsecondary Goal ($B = 0.90$, $SE = 0.29$, 95% CI = [0.32, 1.50], $\eta_p^2 = .14$), and Course of Study domains ($B = 0.58$, $SE = 0.25$, 95% CI = [0.19, 1.18], $\eta_p^2 = .11$). Finally, a two-way analysis of variance (ANOVA) was performed to examine how school quality impacted the relationship between the Total Plan Score and diploma type. The diploma type by School Quality Total (APERS total score) interaction was significant, $B = -6.35$, $SE = 1.83$, 95% CI = [2.68, 10.01], $t(58) = -3.47$, $p < .001$, $\eta_p^2 = .17$. Estimated marginal linear trends were calculated using the emmeans package in R (Russell, 2020). The estimate for the APERS total trend for students on the standard diploma indicated a positive trend, $B = 3.45$, $SE = 1.09$, 95% CI = [1.27, 5.62], whereas the trend for students on the modified diploma was negative, $B = -2.91$, $SE = 1.47$, 95% CI = [−5.85, 0.04]. As shown in Figure 1, students on the standard diploma track who were in schools with higher APERS total scores (school quality) had higher Total Plan Scores.

Discussion

The purpose of the present study was to examine the quality of the transition component of the IEP for a sample of 62 transition-age students with autism. The study contributes to the extant literature on transition plan quality for this population by examining overall plan strengths and weaknesses in addition to associations between overall plan and component quality and student and school characteristics. Overall, plan quality scores ranged from 3 to 20, spanning nearly the entire possible range and indicating a significant variation across plans. Transition Services were an area of relative strength with Course of Study and Transition Assessment being areas of relative weakness. Plans frequently included documentation of quality Transition Services and multiple services aligned with each Postschool Goal. Examples of Transition Services aligned with

Table 5. Correlations Among Transition Plan Quality Domains and Student and Education Characteristics.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Postsecondary Goals																
2. Assessment	.70															
3. Services	.54	.44														
4. Course of Study	.63	.63	.28*													
5. Annual Goals	.35**	.25	.23	.21												
6. Total score	.89	.83	.63	.76	.57											
7. IQ	.34**	.12	.11	.15	−.16	.16										
8. Autism Severity	−.14	−.08	−.19	.04	.15	−.05	−.15									
9. Age	−.18	−.07	.12	−.39***	−.06	−.17	−.30*	−.20								
10. Maternal Education	.16	.17	−.02	.04	.05	.11	.10	.01	−.06							
11. Paternal Education	.34**	.17	.06	.25	.05	.25*	.15	−.02	−.16	.57‡‡						
12. School % Free and Reduced-price Lunch	−.19	−.21	−.17	−.08	−.13	−.21	−.15	.11	.01	−.16	−.37					
13. Self-Determination Knowledge	.23**	.13	.16	.24	−.03	.20	.51	−.42**	−.06	−.02	.18	.07				
14. Adaptive Behavior	.41***	.24	.20	.29	−.29	.24	.64‡‡	−.62***	−.20	−.02	.13	−.09	.63**			
15. School Quality Total	.13	.13	.06	.15	.02	.13	.25	.20	−.18	.11	.09	.08	.09	−.18		
16. School Quality Trans	.02	.16	.01	.17	−.09	.07	.04	.27*	−.03	.19	.02	.16	.01	−.10	.75	
17. Support Needs	−.36**	−.13	−.12	−.13	.08	−.19	−.60	.59	.13	.20	−.23	−.05	−.73	−.79	.05	.20

Note. All correlations were corrected using the Benjamini and Hochberg False discovery rate.
*$p \leq .10$. **$p \leq .05$. ***$p \leq .01$. ‡‡$p \leq .001$.

Table 6. Transition Plan Scores by Diploma Type.

	Standard diploma (n = 34)		Modified diploma (n = 28)				
Domain	*M*	*SD*	*M*	*SD*	*t*	*p* value	η_p^2
Postsecondary goals	2.62	1.18	1.71	1.12	3.07	.003	.14
Transition Assessment	1.65	0.98	1.32	1.09	1.24	.22	.03
Transition Services	3.06	0.65	2.96	.84	0.50	.62	.004
Course of study	1.68	1.07	1.00	.82	2.76	.008	.11
Annual goals	2.03	1.19	1.79	.96	0.87	.39	.01
Total	11.03	3.73	8.79	3.56	2.40	.019	.09

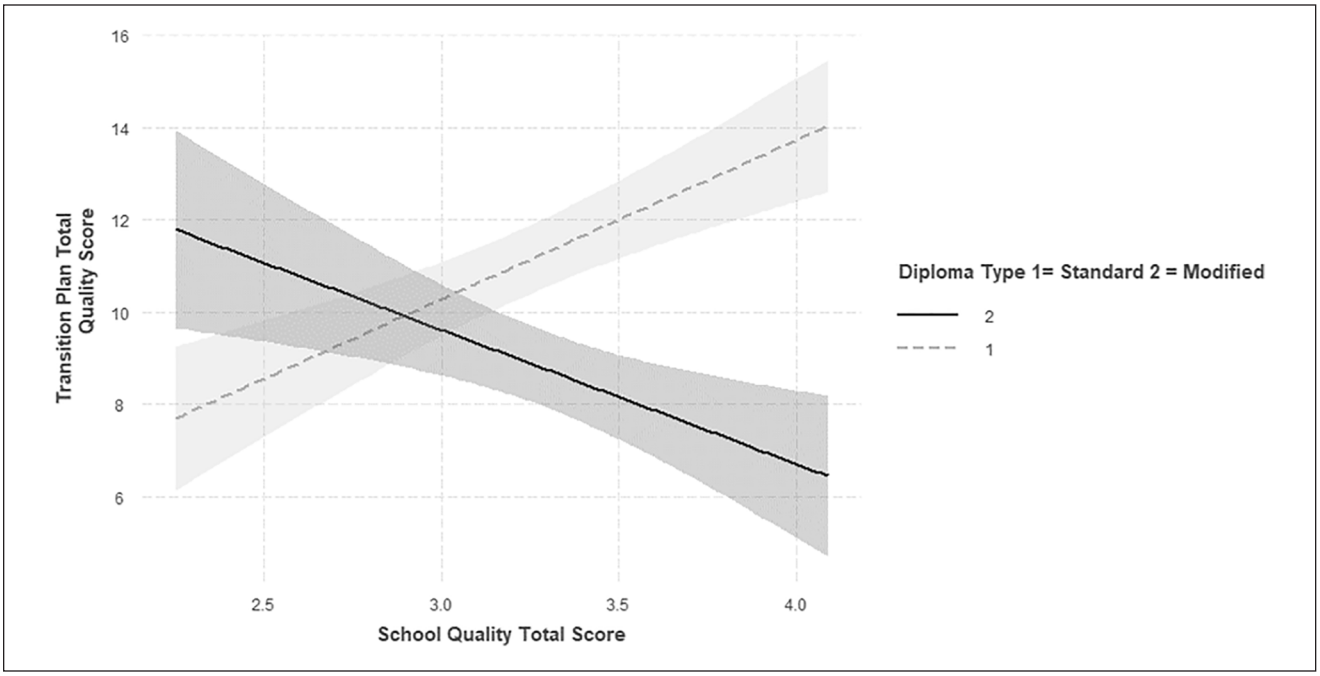

Figure 1. Transition Plan Quality Total by Diploma Type and School Quality Total scores.
Note. Error bars represent 95% CIs surrounding the estimated relationship between the school quality total score and transition plan quality total score. CI = confidence interval.

Employment Postschool Goals included career and vocational exploration and other work-based learning activities. For Education/Training postschool goals, services included virtual tours of college campuses and interviewing staff that work at college disability service programs. For Independent Living Postschool Goals, services included accessing the community to work on safety skills, learning how to develop a monthly budget, and researching what is needed to obtain a driver's license.

Course of Study was the weakest area across the plans, often due to the lack of a multi-year course of study being included and/or courses of study not including electives or other specific classes to support the student's unique learning needs and postschool goals. Transition Assessment was also a relatively weak area across the plans, with plans often not containing information on specific transition assessments utilized, only utilizing one assessment tool, or not utilizing tools that allowed the student to be directly involved and have a voice. Postschool Goals and Annual Goals had some quality features, such as being observable and measurable, but often lacked individualization based on student assessment data or present levels of performance.

Student Characteristics

Although student-level characteristics were not associated with Total Plan Quality (i.e., Total Plan Score), they were associated with individual component quality. Adaptive behavior, paternal education, supports intensity, IQ, and higher self-determination scores were associated with

higher quality postschool goals. This supports the importance of involving students in the transition planning process and development of self-advocacy/self-determination skills. Students who are better able to communicate their wants and needs, in addition to advocate for themselves and their future, have more success in adulthood (Kim, 2019; Shogren et al., 2015). Unfortunately, this is not common practice. In a 2018 systematic literature review, Chandroo and colleagues found that of the 15 research studies reviewed, students with autism had minimal active involvement in the IEP process. A review of the Transition Assessment domain for the transition planning components in the current study also supports the findings from Chandroo et al (2018). Of the 62 plans reviewed, 66% of the plans did not include data on student involvement in the transition assessment process.

Diploma Status

When Total Plan Quality was examined based on diploma status, it was found that the mean transition plan quality of students who were diploma-bound was significantly higher than the plan quality of students who were non-diploma-bound. In particular, the Course of Study domain was higher for diploma-bound students. One reason for this finding may be a function of the coding of the item in that higher scores were given to plans that included multi-year courses of study. These were more often found in plans for diploma-bound students than non-diploma-bound students. The Course of Study for diploma-bound students typically included the specific classes they would take over their high school career. This included general education classes needed for high school graduation as well as college admission. For non-diploma-bound students, the Course of Study was typically only for 1 year at a time and often did not list specific courses but, rather, broad content areas in functional life domains.

School quality also was significantly associated with transition plan quality for diploma-bound students, with higher plan scores for diploma-bound students that came from schools that scored higher on the APERS. Thus, indicators of quality schools, such as interdisciplinary teaming, positive classroom climate, and quality IEP and assessment practices, were related to transition plan quality for diploma-bound students. For students on the modified diploma track, data were less clear and opposite of the expected trend, indicating that there are likely other factors associated with plan quality other than school program quality, as measured by the APERS.

Limitations

Limitations of the present study include a relatively small sample size of IEPs. Only 62 IEPs with transition components were included in the present study; thus, limiting the statistical analyses that could be employed and generalization of findings. In addition, the rubric that was utilized to assess the quality of plans was modified for the CSESA project from a rubric used by the state of Rhode Island. Due to the exploratory nature of this study and initial use of the tool, it lacks robust psychometric data. Also, although the inter-rater agreement correlation for the entire rubric was adequate, the agreement for some of the domain areas was at the lower end of acceptability. Finally, two components that comprise Indicator 13 (student and key stakeholders invited to IEP meeting) were not coded in the present review of transition plans because signature sheets and letters of invitation were not included with the transition planning documents submitted to the research team by the schools. Future research on transition planning quality should ensure methods to attain these documents.

Implications for Future Research

Future research should continue to examine variables associated with transition plan quality and quality transition practices other than student characteristics. This implication supports findings by Doren et al. (2012) that highlight that variables other than student characteristics are related to transition plan quality and should be the focus of intervention. These variables include classroom settings and professional development for teachers (Flannery et al., 2015). It will also be important to conduct prospective, longitudinal research to examine how transition plans change over time (e.g., do plans get more specific as students get closer to graduating or exiting the school system?). In addition, other methods can be used to examine quality (e.g., surveys or interviews with students, parents, and teachers to ask about how personalized and appropriate transition plans are). Moreover, continued development of a rubric used to determine the quality of transition planning for students with autism is needed. The tool used in the present study was modified for its current use and lacked psychometric data. It was not developed specifically for use with individuals with autism. These are areas ripe for continued research in this area.

Implications for Practice

Findings from the current study indicate there is a wide range of transition plan quality for students with autism. Although some quality indicators were associated with student characteristics that are less malleable to intervention, including IQ and adaptive behavior, other variables such as self-determination and active student involvement and engagement in the transition planning process can be the target of school programming and teacher professional development (Doren et al., 2012; Flannery et al., 2015).

Articulating quality transition services that support postschool goals in the areas of employment and education/training was a relative strength in the IEPs reviewed, perhaps reflecting the national focus on college and career readiness that has occurred over the past several years (https://www.air.org/topic/education/college-and-career-readiness). However, the need to support students to be actively involved in transition planning and transition assessment is still readily apparent.

Consistent with findings from Greene (2018), data from the current review of IEPs indicate that transition assessment information on the IEP is often lacking and does not reflect student-specific strengths, needs, and voice. One potential reason for the lack of student-specific transition assessment data is special education teacher's lack of knowledge regarding affordable and accessible assessment tools and how to use them. This could be due to the lack of emphasis on transition planning in preservice teacher preparation programs. In a survey of 573 personnel preparation programs, less than half of the programs addressed transition standards and only 45% had a stand-alone course on transition planning (Benitez et al., 2009). Transition standards and competencies need to be better infused into preservice programs and professional development that occurs for new teachers. Federally funded technical assistance centers, such as the National Technical Assistance Center on Transition: The Collaborative (NTACT:C; see https://transitionta.org/), the Transition Coalition (see https://transitioncoalition.org/), and the Zarrow Center (see https://www.ou.edu/education/centers-and-partnerships/zarrow) should be utilized in teacher preservice and in-service training to support skill development in transition assessment and other transition competencies.

Another practical factor to consider is the IEP form itself (Finn & Kohler, 2009). Although not specifically measured in the current study, anecdotally it was found that more comprehensive, student-centered information was frequently contained within IEP forms that had more space and prompts regarding the assessments utilized. With an increase in educator use of IEP writing and management software, the quality of the plan can be constrained by the form or IEP template within the system. As an example, instead of one general box for transition-related assessment information or a box to check whether assessments occurred, there should be multiple boxes that prompt educators to input information from student interviews, work-related skill observations, and so forth.

Conclusion

The present study contributes to the literature on the quality of transition planning for transition-age students with autism. Although plan quality varied considerably across students, relative strengths regarded the Transition Services domain and relative weaknesses concerned the Course of Study and Transition Assessment domains. Transition plan quality was related to student characteristics as well as diploma pathway and school program quality. Future research should continue to examine the relationship between transition plan quality, quality of programming, and postschool outcomes for students with autism.

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Supplemental Material

Supplemental material is available on the *Career Development and Transition for Exceptional Individuals* webpage with the online version of the article.

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