

# Implementation of a multi-family autism transition program in the high school setting

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## Abstract

Transitioning Together is a multi-family intervention designed to support families of adolescents on the autism spectrum as they prepare for the transition to adulthood. Questions remain regarding its wide-scale adoption and implementation in real-world settings such as high schools. We examined student, teacher, and school-level facilitators and barriers to adopting and implementing Transitioning Together at 30 public high schools across three US states that were participating in the intervention arm of a larger randomized trial, which provided training and coaching for implementation of comprehensive evidence-based autism programming. Seventeen of the 30 schools adopted Transitioning Together. Community socioeconomic status and pre-existing quality of programming for family involvement and transition planning significantly predicted intervention adoption. Thirteen of the 17 schools that adopted Transitioning Together did so with a high level of fidelity (>90%). The areas of fidelity that schools struggled with most related to session structure, facilitating problem-solving and dialogue, and collecting feedback from families. Findings highlight struggles and successes with real-world adoption of the intervention in its current form. Future research is needed to further examine how to facilitate adoption across public high schools and/or other service systems, while maximizing effectiveness, as well as reach to historically underserved autism spectrum populations.

## Lay abstract

Transitioning Together is an intervention that supports families of adolescents on the autism spectrum as they prepare for the transition to adulthood. While it has been delivered successfully and shown to result in positive outcomes for families in the university setting, questions remain about whether and how well it can be widely provided to families in real-world settings such as high schools. In this study, we analyzed predictors, facilitators, and barriers to providing Transitioning Together to families at 30 high schools across three US states, all of which received training from a team of researchers to deliver this intervention. Our findings highlight struggles and successes with real-world use of the intervention. Seventeen of the 30 schools were successful in providing Transitioning Together to families. Schools who had higher community socioeconomic status, higher quality family involvement, and higher quality transition planning programming before changing anything for this study were much more likely to provide this new intervention to families. Schools who used the intervention were mostly able to deliver it as designed and received positive feedback from families who participated. Common parts of the intervention that schools struggled with most included following the structure of the sessions, including group problem-solving and dialogue in the sessions, and collecting feedback from families. Future research is needed to learn how to make it even easier for public high schools and other service systems to provide this intervention to families, in a way that also maximizes its effectiveness and accessibility for historically underserved autism spectrum populations.

## Keywords

autism spectrum disorders, barriers, facilitators, families, high schools, intervention implementation, transition to adulthood

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## Introduction

Autism spectrum disorder is a condition characterized by social communication difficulties and restrictive, repetitive behaviors that present significant challenges to daily functioning throughout the lifespan (American Psychiatric Association [APA], 2013). The incidence of autism began to dramatically increase approximately 20 years ago, recently reaching a peak of 1 in 54 in the United States (Maenner et al., 2020). Because of this rise, approximately 500,000 youth on the autism spectrum will transition into adulthood over the next decade (Roux et al., 2017). Current service systems inadequately support this sizable population in making successful transitions to meaningful, healthy adult lives (Anderson et al., 2018; Shattuck et al., 2012). The education, health-care, and disability service systems are largely disconnected from one another and difficult to navigate (U.S. Department of Health and Human Services [USDHHS], 2017). For many, outcomes in adulthood are poor. In early adulthood, over half of people on the autism spectrum become completely disconnected from work and school, with no source of regular community participation (Myers et al., 2015; Roux et al., 2015). According to a large national survey of adults on the autism spectrum between the ages of 18 and 64, only 14% held a paid job, 54% had a co-occurring mental health condition, and 28% did not have any friends (Roux et al., 2017).

### *Bridging high school and family systems for the transition to adulthood*

The family and high school represent essential systems of support for adolescent development and transition to adulthood readiness (Smith et al., 2012; Wong et al., 2021). Special educators coordinate and provide services, including individualized transition planning and preparation, while students are in high school. After the high school exit, families typically are primarily responsible for navigating and coordinating services themselves, making it critical to engage families in the transition planning process (Smith & Anderson, 2014). Unfortunately, many young adults experience unmet service needs, with limited opportunities for post-secondary education and employment after high school (Anderson et al., 2018; Cheak-Zamora et al., 2015; USDHHS, 2017). There is a need for increased implementation of evidence-based, family-centered transition supports in the high school setting to better bridge this transfer from school-based services to the adult world. Although public high schools represent a promising service system to widely deliver transition support to families of high schoolers with autism, few studies have examined family-centered autism-related interventions delivered in high school settings (Smith & Anderson, 2014).

### *Family-centered transition programming and high school implementation*

One transition intervention called Transitioning Together has shown promising improvements for families of youth on the autism spectrum (Dawalt et al., 2018; Smith et al., 2012). Transitioning Together is a research-based multi-family group psychoeducation intervention for adolescents on the autism spectrum and their parents (Smith et al., 2012). It was developed and tested in the space of a neurodevelopmental disabilities center on a university campus. The youth participants in the prior trial of this intervention were mostly white, non-Hispanic males between the ages of 14 and 17 who were participating in a general education high school setting for at least 50% of the school day. Their parents were predominantly white, non-Hispanic mothers with a bachelor's degree. The Transitioning Together program begins with two individual family joining sessions, which aim to clarify each family's goals and to build rapport and partnership between each individual family and program facilitators. Next, groups of 5–10 families attend eight weekly 90-min group sessions, during which parents and adolescents on the autism spectrum split to form parallel parent and adolescent groups. After the conclusion of weekly group meetings, families continue to have access to transition-related resources and referrals. Transitioning Together has been associated with increased social engagement for youth and improvements in problem-solving skills and decreased depressive symptoms for parents (DaWalt et al., 2018). Yet, questions remain regarding the wide-scale adoption of this and other transition to adulthood interventions in real-world settings.

Implementation of evidence-based interventions is complex and multi-faceted, especially in a school-based context. Prior research on comprehensive evidence-based behavioral intervention implementation in high schools (i.e., Positive Behavior Interventions and Supports) reveals a reality that substantial deviations from the original evidence-based programs occur and that various barriers interfering with implementation quality arise (Molloy et al., 2013). As illustrated in the Consolidated Framework for Implementation Research (CFIR; Damschroder et al., 2009), successful translation of effective interventions into service system contexts depends on the following factors across multiple levels: intervention characteristics (e.g. strength of evidence), outer setting (e.g. organizational resources to meet client needs), inner setting (e.g. organizational leadership), individual characteristics (e.g. interplay between clients and organizational behavior change), and process (e.g. program planning and evaluation).

Although high schools are potentially an ideal setting for delivering an intervention like Transitioning Together given the accessibility and familiarity of high schools for

the target population, as well as transition planning expertise of special educators, potential barriers across the CFIR levels can be anticipated. Many public school districts may lack the necessary resources for implementation and leadership may consider family-centered programming to fall outside of the school's reach (Lee & Lee, 2020; Morgan & Amerikaner, 2018). Individual educators have many competing responsibilities and may lack the capacity or skills to provide new family-centered interventions (Rosenberg & Walther-Thomas, 2014). As demonstrated in prior studies, characteristics of high schoolers on the autism spectrum themselves (e.g., level of impairment in daily functioning, severity of autism symptoms) may affect families' motivations to participate in school-based transition programming as well as the schools' programming decisions (Rosen et al., 2019; Shepherd et al., 2018). The needs of individuals across the autism spectrum are extremely diverse and high school staff and leadership have varying resources, priorities, and attitudes across schools and districts—likely causing implementation outcomes to vary widely and further complicating wide-scale dissemination (Dulude & Milley, 2021). Further research is needed to determine whether high schools are able to adopt family-centered transition interventions, and to what extent fidelity to this type of evidence-based program as designed can be maintained. It is important to explore which barriers most commonly stand in the way of adopting family-centered transition intervention in high schools, and to understand which intervention components schools struggle with implementing most.

### Study objectives

The rationale for this study is grounded in the importance of understanding how to feasibly implement accessible, family-centered autism transition-to-adulthood programming with families of high schoolers on the autism spectrum. To address current gaps in the research, this study had the following two objectives:

1. To identify student-, teacher-, and school-level facilitators to adopting Transitioning Together when given the opportunity for training, coaching, and materials, and the option to implement it as part of a larger study's individualized comprehensive treatment program.
2. To identify barriers to adopting Transitioning Together; and once adopted, the aspects of the intervention that were implemented with deviations from fidelity.

### Methods

This study took place within the Center on Secondary Education for Students with Autism Spectrum Disorders

(CSESA)—a large clinical trial designed to evaluate the effects of providing high schools with the training, materials, and coaching needed to implement a comprehensive, evidence-based intervention program for students on the autism spectrum (Steinbrenner et al., 2020). Sixty geographically and socioeconomically diverse public high schools across North Carolina, Wisconsin, and California representing 40% urban, 45% suburban, and 15% rural areas were in the study. To recruit schools, study staff followed school district policies for applying to conduct research; this often involved contacting superintendents and directors of special education programs. To be eligible for participation, schools had to be in a public district, serve students with and without disabilities, and have at least eight potentially eligible students with a primary or secondary educational disability label of autism enrolled. Once it was confirmed that a school or set of schools met criteria for participation, school leadership signed a Memorandum of Understanding as an agreement detailing the commitments of the CSESA team and the school staff, and three staff members consented to study participation. Once these steps were complete, a block randomization process was employed to randomly assign schools within districts to evenly receive CSESA programming or services as usual. If only one or an odd number of schools within a district were participating, then a similar school in terms of size and urbanicity was added to that block. After randomization, additional school staff were recruited to either be a part of the CSESA school team or to complete assessments for students who were participating in the study. Students were invited to participate in the study via a first contact from a member of the school team followed by provision of a study recruitment and consent packet.

There were no significant sociodemographic differences between the intervention and service-as-usual schools. After randomization, 547 students on the autism spectrum (intervention schools  $n=303$ ; service-as-usual schools  $n=244$ ) and 579 school staff (intervention schools  $n=392$ ; service-as-usual schools  $n=187$ ) were recruited, consented, and enrolled to participate in the study. Larger teams were recruited at the intervention schools purposefully, as more staff were needed at those schools to fill a variety of roles for comprehensive CSESA program implementation.

Each high school formed a team of willing staff participants who worked with the research team to provide the data to the CSESA study, henceforth referred to as "school teams." School teams at the service-as-usual schools implemented the interventions that they would typically provide for their high schoolers on the autism spectrum. In contrast, CSESA intervention school teams collaborated with the research team to receive training and implement components of the comprehensive CSESA program (Odom et al., 2014; <https://csefa.fpg.unc.edu/>) to their students on the autism spectrum across a 2-year partnership.

The comprehensive CSESA program included 13 evidence-based interventions across five different units that were seen as essential school programming for students on the autism spectrum: (1) CSESA program foundations, (2) academics, (3) independence and behavior, (4) transition and family, and (5) social and peer relationships (Hume et al., 2021). School team members in the intervention schools were encouraged but not required to implement all components of the CSESA program with their students, especially those that aligned with individualized student goals. Throughout provision of training and coaching that supported school-based adoption and implementation of the comprehensive program, the research team collected data on the content and duration of intervention coaching and monitored implementation fidelity using structured observation fidelity forms (Supplemental Document 1; Steinbrenner et al., 2020). Main trial findings suggested that in comparison to the “services as usual” schools, intervention schools had significantly higher program quality and their students had higher attainment on individualized educational goals after the 2 years of comprehensive CSESA programming (Hume et al., 2021).

The high school version of Transitioning Together, the intervention of focus in this study, was packaged as part of the larger CSESA curricular unit addressing Transition and Family. Transitioning Together is an 8-week multi-family group psychoeducation intervention designed to provide information and support to families of transition age youth on the autism spectrum (DaWalt et al., 2018; Smith et al., 2012). The eight 90-min sessions consist of concurrent parent and teen groups, thus requiring one teen group facilitator and one parent group facilitator. During the pilot phase of CSESA, Transitioning Together was modified from its original clinical design to be implemented by educators working with high schoolers on the autism spectrum and piloted at three high school sites. Modifications drew from the existing literature and research team members’ extensive experience implementing interventions in school settings, in addition to feedback solicited from critical stakeholders on the acceptability, feasibility, design, and anticipated impact of the intervention (Kucharczyk et al., 2015). Notable differences from the clinical version included (1) additional student activities that support the development of self-determination and executive functioning skills, (2) a decision tree to help identify potential group facilitators, (3) a menu of suggestions to improve family attendance (e.g. alternate schedules, meals, and high school credit options), and (4) flexibility regarding whether to hold zero, one, or two initial joining sessions before beginning the group sessions to reduce burden on school staff and families. Across all CSESA intervention schools, the Transition and Families unit training included discussion on identifying skilled Transitioning Together facilitators for parent and teen groups. All school teams at CSESA intervention schools received a 90-min training on

Transitioning Together that provided an introduction to the intervention’s goals, components, topics, and format. Afterward, a coach from the CSESA research team, who had previously completed a 2-day Transitioning Together training, was available to support each school team in creating a Transitioning Together implementation plan. CSESA coaching followed collaborative, evidence-based coaching procedures that emphasized active learning driven by school, teacher, and student needs (Kucharczyk et al., 2021). Once program facilitators were identified, school teams worked out the additional logistics to adopt and provide the intervention. Sessions were all held in-person on weekdays outside of school hours in the afternoon or early evening. See Table 1 for characteristics of the 303 students on the autism spectrum from the 30 CSESA intervention schools as well as characteristics of the high schools, with data reported separately for schools who did versus did not implement Transitioning Together during their 2-year CSESA partnership.

Of note, Transitioning Together was the only CSESA intervention that required family involvement. Families participating in CSESA had high school students with an educational label of autism and who were actively participating in special education services. Over one-third of the students in our CSESA study identified as non-white and/or Hispanic, indicating more ethnic and racial diversity in the CSESA sample compared with many previous autism studies (Broder-Fingert et al., 2017; West et al., 2016). Each family was allowed to include family members of their choice (e.g. mothers, fathers, grandparents) in the Transitioning Together sessions, but session-to-session attendance of specific family members was not tracked. Sociodemographic data were collected on participating students, but not their parents or other family members.

## Measures

Data were collected, as part of the larger CSESA study, to determine the number of schools implementing each of the comprehensive program evidence-based interventions, including Transitioning Together. School teams recorded their plans and processes for implementation of the comprehensive CSESA program on a school planning form. They also worked with a coach from the research team to determine a training schedule and implementation timeline. One coach was assigned to each school or intervention component and maintained coaching notes to record discussion topics from meetings with school teams and decisions made, including decisions on whether to adopt evidence-based interventions from the comprehensive program. The contents of coaching logs were standardized across CSESA research staff. A total of seven coaches provided coaching on Transitioning Together and completed coaching log entries specific to this intervention. The following details of interactions between CSESA research

**Table 1.** Characteristics of participating high school students and high schools.

Students	CSESA intervention	Schools that adopted TT	Schools that did not adopt TT
	( <i>n</i> = 303)	( <i>n</i> = 181)	( <i>n</i> = 122)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Sex			
Male	264 (87.1)	159 (87.8)	105 (86.1)
Female	39 (12.9)	22 (12.2)	17 (13.9)
Race			
American Indian/Alaskan Native	8 (2.6)	3 (1.7)	5 (4.1)
Asian American	9 (3.0)	6 (3.3)	3 (2.5)
Black/African American	37 (12.2)	29 (16)	8 (6.6)
Multiple Races	22 (7.3)	14 (7.7)	8 (6.6)
White	193 (63.7)	113 (62.4)	80 (65.6)
Other	34 (11.2)	18 (14.8)	16 (8.8)
Ethnicity			
Hispanic	53 (17.5)	36 (19.9)	17 (13.9)
Non-Hispanic	230 (75.9)	138 (76.2)	92 (75.4)
Other	20 (6.6)	7 (3.9)	13 (10.7)
Diploma type			
Standard	172 (56.8)	86 (47.5)	86 (70.5)
Alternative	131 (43.2)	95 (52.5)	36 (29.5)
Grade at study enrollment			
9	102 (33.7)	66 (36.5)	36 (29.5)
10	66 (21.8)	36 (19.9)	30 (24.6)
11	82 (27.1)	48 (26.5)	34 (27.9)
12	26 (8.6)	15 (8.3)	11 (9.0)
Other	27 (8.9)	12 (6.6)	8 (6.6)
Household income level (Dollars)			
<20,000	21 (6.9)	11 (6.1)	10 (8.2)
20,000 to 39,000	45 (14.9)	22 (12.2)	23 (18.9)
40,000 to 59,000	28 (9.2)	16 (8.8)	12 (9.8)
60,000 to 79,000	32 (10.6)	25 (13.8)	7 (5.7)
80,000 to 99,000	26 (8.6)	16 (8.8)	10 (8.2)
>99,000	94 (31)	64 (35.4)	30 (24.6)
No report	57 (18.8)	27 (14.9)	30 (24.6)
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )
Age at study enrollment (years)	16.0 (1.4)	16.0 (1.4)	16.0 (1.3)
Nonverbal IQ standard score	86.3 (26.9)	83.4 (26.1)	90.4 (27.6)
Vineland-II ABC standard score	76.1 (17.0)	75.86 (16.8)	76.4 (17.2)
SRS-2 Total T-score	90.0 (32.9)	90.2 (32.9)	89.6 (33.1)
High Schools	<i>n</i> = 30	<i>n</i> = 17	<i>n</i> = 13
Number of staff in school team	13.1 (6.3)	12.6 (5.7)	13.7 (7.3)
Number of students in CSESA Study	10.1 (1.8)	10.7 (1.6)	9.4 (1.9)
Baseline autism team staff EBPAS score	3.2 (0.2)	3.2 (0.2)	3.2 (0.2)
Baseline school APERS-TF score	2.5 (0.5)	2.6 (0.5)	2.5 (0.6)
SES index score	5.7 (1.4)	6.1 (1.5)	5.2 (1.1)

CSESA: Center on Secondary Education for Students with Autism Spectrum Disorders; TT: Transitioning Together; SD: standard deviation; IQ: intelligence quotient; ABC: Adaptive Behavior Composite; SRS: social responsiveness scale; EBPAS: Evidence-Based Practices Attitudes Scale; APERS-TF: Autism Program Environment Rating Scale, Transition Planning & Family Involvement subscale; SES: socioeconomic status. Standard Score normative *M* = 100, *SD* = 15; T-score normative *M* = 50, *SD* = 10. SES Index was on a scale of 0 to 10, with 5 representing national US average.

staff coaches and members of school teams were systematically documented: open-ended notes on topics discussed at each coaching session, time spent, intervention/program components discussed, and needed follow-up actions.

In this study, hypothesized predictors of Transitioning Together adoption from across levels indicated in CFIR (Damschroder et al., 2009) included: baseline adaptive skill level of the students on the autism spectrum in the program, baseline attitudes of participating school staff toward evidence-based practices, the baseline quality of school environment for transition planning and families, and socioeconomic status (SES) of the school community. We were additionally interested in the parent feedback regarding the feasibility, acceptability, usefulness, and perceived effectiveness of the intervention after completing their participation. Measures of these constructs are described in the sections below.

**Fidelity of implementation.** Once a school team had received training on an intervention component and implementation began, coaches assessed the percentage of implementation fidelity using a CSESA Fidelity tool developed for each unique evidence-based intervention. The Transitioning Together fidelity form reflected the essential components according to the program's original developer across five domains: dosage, preparation and structure, process, strategies and content, and evaluation and progress monitoring (see Supplemental Document 1). One to three items composed each of these five domains with each item having one to four features that could be checked as met; coaches rated each item using the following 4-point scale: 0 (no features observed), 1 (low, less than half but at least one feature was observed), 2 (mid, half or more features were observed), or 3 (high, all features observed). Five items were given all-or-none credit (one feature per item); four items were rated as a 0, 1, or 3 (two features per item); and two items were rated as a 0, 1, 2, or 3 (three or more features per item). All items were weighted equally to calculate the total proportion of fidelity that was attained. Fidelity checks using this tool were completed by trained CSESA coaches across an average of three direct observations of the intervention while it was being delivered. We also used the data from these fidelity forms to assess the specific aspects of the intervention that were not delivered with full fidelity, and the frequency at which these struggles with fidelity occurred across schools.

**Adaptive behavior skills.** Adaptive behavior skills were measured at baseline with the Vineland-II Adaptive Behavior Composite (ABC) Standard Score. The Vineland-II is a norm-referenced standardized measure of adaptive behavior, which is defined as the things people do to function in their everyday lives (Sparrow et al., 2005). The ABC describes one's overall level of adaptive functioning in the school setting, and is based on scores across Communication, Daily

Living Skills, and Socialization domains. ABC Composite Standard Scores have a normative mean of 100 and standard deviation of 15. In this study, the Vineland-II was completed by a teacher using the Teacher Rating Form.

**School staff attitudes toward evidence-based practices.** School staff attitudes toward and readiness to adopt evidence-based practices were measured at baseline with the Evidence-Based Practices Attitudes Scale (EBPAS; Aarons, 2004; Aarons et al., 2010). The EBPAS is a standardized measure composed of four subscales that assess provider-perceived intuitive appeal of evidence-based practices, openness to new practices, likelihood of adopting the evidence-based practice given requirements to do so, and divergence between evidence-based practices and current provider practices. The EBPAS has 15 items that are rated on a 4-point Likert-type scale. School-level means of total EBPAS scores across each school team were used in analyses for this study.

**Quality of school environment for transition planning and families.** The quality of school environment for transition planning and families was measured at baseline with the Autism Program Environment Rating Scale, Transition Planning & Family Involvement subscale (APERS-TF; Odom et al., 2018). The APERS is a program rating scale based on focused observations, interviews, and document review. It consists of 66 items each rated on a 5-point scale (1=poor quality, 5=superior quality) with specific criteria for each item. These items load onto 10 domains: Learning Environments, Positive Learning Climate, Assessment and IEP Development, Curriculum and Instruction, Communication, Social Competence, Personal Independence and Competence, Functional Behavior, Family Involvement, and Teaming. The APERS was administered by trained CSESA research staff, who spent one full day at each participating school observing a sample of classes and program environments of students on the autism spectrum in the study. In addition, as part of the APERS administration, the CSESA research staff conducted six to eight interviews with school staff and parents, reviewed individualized education programs and transition plans of three representative students, and then scored the APERS items. Total APERS scores have strong internal consistency (Cronbach's alpha=0.94 to 0.95; Odom et al., 2018). The Transition Planning and Family Involvement subscale is a collection of 10 items from the APERS. These include the four items that comprise Family Involvement domain (Cronbach's alpha=0.68 to 0.74; Odom et al., 2018) and six transition-related items that are embedded within a variety of the other domains listed above.

**School community SES.** School community SES was measured according to the neighborhood SES index, which was calculated based on data from the US Census Bureau's 2011–2015 American Community Survey. The SES index scores incorporated median household income, percentage

of individuals with income below the Federal Poverty Line, educational attainment of adults, unemployment rate, and percentage of households with children under the age of 18 that are “female headed” (no male present; Miles et al., 2016). Possible SES index scores were between 0 and 100, with 50 representing the national US average, and was converted to a 0–10 scale for this study.

**Parent feedback.** Parents were invited to complete surveys about their study participation, including a 10-item questionnaire specific to their experiences with Transitioning Together. Five of the items related to perceived feasibility and acceptability (e.g. I attended Transitioning Together with a good deal of enthusiasm). The other five items pertained to usefulness and effectiveness (e.g. Transitioning Together promoted parent education and support). Parents rated each of the 10 items on a Likert-type scale from 1 (Strongly Disagree) to 6 (Strongly Agree).

### *Statistical analyses*

Generalized estimating equations (GEEs) were used to test individual predictors of schools, clustered within states, adopting Transitioning Together (17 schools adopted, 13 schools did not adopt). Predictors signaling a potential main effect ( $p < 0.20$ , Table 2) were fit into a multivariate GEE model (Table 3). Coaching logs and fidelity forms were systematically reviewed to assess the types of barriers to adoption and the specific areas of deviation from fidelity that occurred during implementation.

### *Analysis of coaching logs*

For the purposes of this study, coaching logs were retrospectively reviewed for mention of barriers to and facilitators of Transitioning Together implementation. Facilitators were defined as factors that eased program adoption and barriers were defined as factors that interfered with program adoption. Two coders individually reviewed coaching log notes for specific facilitators and barriers that naturally arose. The first time when barriers and facilitators were encountered, they were added to a table along with the school ID. If the same barrier or facilitator arose in the notes of additional schools, those school IDs were added. These were tabulated such that each school either did or did not experience each barrier and facilitator that arose across the sample of schools. The two individuals reviewing the coaching notes met to resolve minor disagreements of how to consolidate and capture specific facilitators and barriers and contacted the CSESA coaches for clarification as needed, ultimately reaching consensus.

### *Community involvement*

Stakeholders from the autism community, including self-advocates, family members, clinicians, and educators, were involved in the development of the school-based

Transitioning Together intervention and its implementation. This co-production occurred through formal focus groups and interviews with stakeholders, as well as guidance from an advisory committee.

## **Results**

### *Facilitators of adopting Transitioning Together*

Seventeen of the 30 schools receiving CSESA supports adopted Transitioning Together. Final adjusted model results indicated that for every one-unit increase on the SES index, there was a 90% increase in the likelihood of adoption (adjusted odds ratio (aOR)=1.90,  $p < 0.001$ ). For each one unit increase in APERS-TF score, there was a 71% increase in the likelihood of adoption (aOR=1.71,  $p = 0.02$ ). See Table 3 for full adjusted model results. Student Vineland-II ABC Standard Scores and school team EBPAS scores did not significantly relate to adoption (See Table 2) and were not included in the final adjusted model as their inclusion resulted in poorer model fit.

Support from an outside organization arose as a common facilitator at all but one of the 17 schools that adopted the intervention. These outside organizations included local non-profit autism societies and university graduate programs; individuals from these organizations/programs donated the time and effort of an individual to co-facilitate the intervention along with identified school staff facilitators. In addition, the availability of a culturally and linguistically adapted version of the intervention for Latinx, Spanish-speaking families facilitated culturally relevant intervention delivery in Spanish at two of the schools (Kuhn et al., 2020).

### *Barriers to adopting Transitioning Together*

At the 13 schools that did not ultimately adopt Transitioning Together, several barriers were noted in coaching logs (See Table 4). The most common barriers, which occurred in 46% of these 13 schools, included a lack of school-level interest in implementing a family-centered program, and difficulty identifying a program facilitator, often due to limited staff capacities, staff shortages, and turnover. A low level of family-level interest or willingness to participate interfered with implementation at 23% of these schools. Notably at one school, school staff completed all necessary planning and delivered the first two sessions of Transitioning Together only to have the two families who had initially expressed interest stop attending. Budget constraints arose as an implementation barrier at only one school. In this case, budgets prevented overtime pay, which would have otherwise allowed staff to dedicate paid time to program delivery.

### *Intervention fidelity and deviations during implementation*

The 13 schools that implemented Transitioning Together did so with a high level of fidelity (>90%). Overall, the mean

**Table 2.** Bivariate associations between individual student-, teacher-, and school-level variables with adopting Transitioning Together, accounting for clustering by state.

	B (SE)	p	OR	OR: 95% CI
Mean Student Vineland-II ABC Standard score	0.06 (.05)	0.27	1.06	[0.96, 1.17]
Mean A-Team EBPAS total score	0.17 (1.17)	0.89	1.18	[0.12, 11.80]
Transition & Family Involvement Total APERS score	0.54 (0.39)	0.17*	1.71	[0.79, 3.71]
SES index	0.53 (0.09)	< 0.001*	1.70	[1.41, 2.04]

SE: standard error; OR: odds ratio; CI: confidence interval; EBPAS: Evidence-Based Practices Attitudes Scale; APERS: Autism Program Environment Rating Scale; SES: socioeconomic status.

\*Predictor meeting criteria ( $p < 0.20$ ) to consider for inclusion in a multivariate generalized estimating equation (GEE) model.

**Table 3.** Facilitators of adopting Transitioning Together, accounting for clustering by state (GEE model).

	B (SE)	p	aOR	aOR: 95% CI
SES index	0.64 (0.03)	<0.001	1.90	[1.79, 2.02]
Transition & Family Involvement Total APERS score	0.97 (0.43)	0.02	1.71	[1.14, 6.08]

GEE: generalized estimating equation; SE: standard error; aOR: adjusted odds ratio; CI: confidence interval; SES: socioeconomic status; APERS: Autism Program Environment Rating Scale. aOR = Exp(B).

**Table 4.** Specific barriers to adoption ( $n = 13$  schools that did not adopt the intervention).

Type of adoption barriers	Frequency and proportion of schools with barrier
Difficulty identifying a program facilitator	6 (46%)
Lack of school interest in family-centered program	6 (46%)
Low level of family participation/interest	3 (23%)
Budget constraints	1 (7%)

percentage of fidelity achieved was high ( $m = 95\%$ ,  $SD = 8\%$ ), with a range between 73% and 100%. Several aspects of the intervention stood out as most challenging to fully implement according to scores documented on the fidelity observations. Almost half of the intervention facilitators (47%) did not follow the standard lesson structure, which includes a warm-up, family check-ins with follow-up on prior concerns, and introduction of the new topic for the day. At a rate of 35% (six schools), intervention facilitators did not consistently collect required feedback from families and/or monitor family engagement. Five of the schools' facilitators (29%) struggled with consistently implementing the problem-solving sessions and fostering dialogue between families. At varying combinations of three of the schools (18%), facilitators struggled to sufficiently emphasize positivity; to consistently maintain a solution-based orientation to problems discussed; and/or to conduct joining sessions setting with compilation of individual family goals. At two schools, facilitators did not consistently deliver sessions that were full 90 min in length. At one school, families of children with disabilities other than ASD were included in the group. Also

at a single school, guest speakers were not arranged. The rates at which all aspects of intervention fidelity were maintained are outlined in Table 5.

### Parent feedback

Finally, results from the parent feedback questionnaire suggested overall -to-strong agreement across all items. The minimum mean item rating was 5.16, which was on the item stating "Transitioning Together was easy for our family to participate in." The maximum mean item rating was 5.95, showing strong agreement with the following statement: "I would recommend the program to other parents whose child has similar needs." A total of 19 parents completed the questionnaire. Sixteen parents completed all 10 items. The remaining three parents did not respond to the following single item for an unknown reason: "Transitioning Together promoted parent education and support." For means and standard deviations of parent ratings across all 10 items, see Table 6.

### Discussion

Even when provided formal training and coaching from a research team to support adoption of Transitioning Together, only 17 of the 30 participating schools did so. The schools situated in higher socioeconomic communities and the schools with higher quality pre-existing programming related to family involvement and transition planning were significantly more likely to adopt the program. This suggests that youth in schools set in lower SES communities and youth with access to lower quality programming were least likely to benefit from the opportunity of intervention participation. This is especially concerning when considering that in young



**Table 5.** Observed deviations from fidelity ( $n = 17$  schools that adopted the intervention).

Fidelity domain	Frequency and proportion of schools with a deviation from full fidelity
Lesson structure (welcome, warm-up, updates, etc.)	8 (47%)
Feedback and data (complete family engagement ratings and survey families for feedback)	6 (35%)
Group sessions (include problem-solving session and dialogue between families)	5 (29%)
Joining sessions (conducted with each family, including compilation of goals)	3 (18%)
Facilitator strategies (emphasis on positivity and solutions to problems)	3 (18%)
Amount (session length of 90 min)	2 (12%)
Group structure (groups only include families of youth on the autism spectrum)	1 (6%)
Speakers (arrangements are made for guest speakers)	1 (6%)
Frequency (six to eight sessions)	0 (0%)
Organization (materials/activities are organized for group sessions)	0 (0%)
Lesson content (targeted for families of youth on the autism spectrum)	0 (0%)

**Table 6.** Transitioning together parent feedback questionnaire ratings ( $n = 19$  parents).

	Mean rating (1 to 6 scale)
<b>Feasibility and acceptability</b>	
The amount of time required for Transitioning Together is reasonable	5.6 (0.5)
Transitioning Together was easy for our family to participate in	5.2 (0.9)
I attended Transitioning Together with a good deal of enthusiasm	5.4 (0.9)
Transitioning Together was appropriate for our family	5.6 (0.7)
I would recommend the program to other parents whose child has similar needs	6.0 (0.2)
<b>Usefulness and effectiveness</b>	
Transitioning Together is a good way to support the needs of families of students with autism	5.7 (0.5)
I am likely to keep in touch with other families who attended this group	5.4 (0.6)
Transitioning Together promoted parent education and support	5.6 (0.6) <sup>a</sup>
I learned valuable information during Transitioning Together	5.6 (0.6)
It was helpful to connect with other families during Transitioning Together	5.5 (1.0)

<sup>a</sup>The item had a reduced sample size of 16 parent responses. Ratings were made on a Likert-type scale with a possible range of 1 (strongly disagree) to 6 (strongly agree).

adulthood, individuals from low-income households have a significantly increased risk of being disconnected from needed autism-related services (Eilenberg et al., 2019), which can in-turn worsen the long-term impacts of autism on daily functioning, health, and well-being (Anderson et al., 2020).

Our findings did not support an association between intervention adoption and student adaptive behavior or teacher attitudes toward evidence-based practices. This suggests that schools did not consider transition support to be something only youth with certain levels of adaptive functioning need, and that overall school team evidence-based practice attitudes did not vary with adoption. Instead, we suspect that having at least one school staff member who has a sufficiently positive attitude toward evidence-based practices to take on the role of coordinating and facilitating this intervention was a critical readiness factor for intervention adoption.

### *Barriers to and facilitators of intervention adoption*

Our review of coaching logs revealed one major facilitator to implementation, as well as several commonly experienced

barriers. All but one of the 17 schools who adopted the intervention did so with the support of a co-facilitator from a local non-profit autism society or university graduate program to deliver the intervention. This speaks to the potential importance of external community connections to supply staffing assistance for schools to adopt and deliver this intervention, particularly since Transitioning Together often occurs outside of regular school/work hours to allow family members to attend. Notably, the availability of the culturally adapted version of Transitioning Together for Spanish-speaking Latinx families (Kuhn et al., 2020) facilitated intervention adoption at two schools where delivery in Spanish was needed.

Regarding barriers, 6 of the 13 schools who did not adopt the intervention experienced a major barrier of not being able to identify staff to facilitate the intervention. Although staffing arose as a major factor to facilitate or prevent adoption, budget constraints more broadly were rarely recorded as a barrier. At 6 of the 13 schools that did not adopt the intervention, there was a barrier of limited school-level interest in providing a family-centered program. Yet, in few cases families were disinterested or

otherwise unable to participate in such programming (three schools, 23%). These barriers imply that further adaptation of Transitioning Together for the high school setting may be needed to enhance feasibility and motivation to adopt it. First, adjustments to the format and location of group intervention sessions could improve implementation feasibility. For example, some portions of the adolescent group could be delivered as part of the regular school day and parent session content could be delivered virtually via video conferencing, with some pre-recorded asynchronous content. The provision of Transitioning Together training and coaching at the district rather than individual high school level is a simple adaptation that would expand the pool of potential facilitators by including district-level staff such as parent liaisons, social workers, special education coordinators, and school psychologists. This could have the added benefits of increasing the numbers of families to form groups and supporting buy-in at a district leadership level. School and district leaders' priorities also could be shifted through advocacy for additional funding and policy that supports family-centered autism transition programming at the state and national levels.

### *Intervention fidelity*

The schools who did implement Transitioning Together were generally able to do so with a high level of fidelity, maintaining key aspects of the intervention. Furthermore, parents who provided feedback after participating expressed agreement to strong agreement that the intervention was feasible, acceptable, useful, and effective. In other words, if schools were able to overcome barriers to adoption discussed above, they were mostly (76%) able to deliver the intervention as designed (over 90% fidelity) and they received positive feedback from families who participated. The most common deviation from fidelity had to do with lesson structure, which we view as the peripheral framing of the core intervention. Nearly half of facilitators chose to frame the sessions with a welcome and introduction portion of the session differing from what is prescribed (provides a welcome, introduction, and facilitates a warm-up discussion with updates from families and summaries about teen activities). Next, a handful of schools struggled to monitor engagement of and collect feedback from families, as well as carry out the problem-solving sessions and dialogue between families.

By virtue of being frequently omitted, we suspect the areas with the most common deviations from fidelity were less acceptable to school-based facilitators in contrast to intervention components that were more consistently implemented. In particular, over 80% of the schools implemented the following aspects of the intervention with full fidelity, suggesting a high degree of acceptability and feasibility in the following areas: an emphasis on positivity and solutions to problems, the exclusive inclusion of families of youth on the autism spectrum, provision of autism

transition-related lesson content, provision of at least six sessions for 90 min each, organization of materials for group sessions, and use of guest speakers. Of note, the level of fidelity that would have been attained at the 13 schools who did not adopt is unknown, and future research is needed regarding the extent to which schools with poorer baseline quality programming and situated in lower socioeconomic contexts are able to implement this intervention with fidelity.

The deviations from fidelity that most commonly occurred highlight areas to initially consider for extra implementation support and planned adaptation to further improve future school-based intervention implementation. It is possible that staff delivering the program perceived that these particular components were not "core components" and could be left out without impacting primary intervention outcomes for families. Yet, unplanned intervention adaptations are more likely to weaken treatment outcomes (Kirk et al., 2020). Future research is needed to determine whether further adaptations to improve Transitioning Together acceptability and fit in the school setting can be made while maintaining overall program effectiveness. This research must be conducted with a clear understanding of core intervention components that are expected to impart the greatest benefits versus adaptable periphery (Damschroder et al., 2009). Such work will be beneficial to widely and efficiently disseminate the indispensable aspects of the intervention with fidelity. Along every step of this process, an emphasis on equity must be made, such that the resulting version of the program can be delivered with high fidelity and reach across diverse socioeconomic and cultural contexts (Baumann & Cabassa, 2020). This extends to the need for cultural adaptations of the intervention and localization to specific communities. Some of this work has begun with the development of a process to culturally and linguistically adapt Transitioning Together and the initial application of this process with a community of Spanish-speaking, Latinx families (Kuhn et al., 2020) prior to implementation as part of the CSESA study.

### *Limitations*

The primary limitation of this study is that we were not able to evaluate the effectiveness of the particular intervention of interest. This limitation was due to the larger study design: Transitioning Together was embedded into a comprehensive model spanning 13 evidence-based interventions that were made available based on real-time goals and needs of individual students (Odom et al., 2014). It is not possible to determine the effects of any of the isolated interventions within the comprehensive CSESA program. Rather, the primary aim of the larger study was to determine the effects of the comprehensive program as a whole (Hume et al., 2021). As reported by Steinbrenner and colleagues (2020), a multi-faceted implementation index was used to assess clinical outcomes of the comprehensive

program; our team found that the CSESA implementation index did differentiate CSESA intervention from treatment as usual schools in expected directions.

An additional limitation to this study is that we are unable to provide an unbiased picture of family engagement or satisfaction with the program. Schools were not required to provide engagement ratings or parent satisfaction surveys that they administered with families to the study team. Of note, the small number of parent user ratings ( $n=19$ ) that were collected by the CSESA study team after intervention implementation indicated strong and positive parent ratings of Transitioning Together's feasibility, acceptability, usefulness, and effectiveness (Table 6). However, families who were dissatisfied with or disengaged from the program may have been less likely to provide the study team with feedback.

It was also not possible to employ qualitative methods such as qualitative interviewing, thematic analysis, and member checking with members of school teams. This is a limitation to the study as such methods may have led to a more robust understanding of barriers to, and facilitators of, Transitioning Together implementation in high schools. Furthermore, it was not possible to check fidelity scores via calculation of inter-rater agreement because only one member of the CSESA research team was assigned to each high school and available to conduct observations to complete the structured fidelity checklist.

Finally, due to the sample size of only 30 schools, it would not have been appropriate to statistically analyze additional school, teacher, or child-level variables that may be of relevance. With only 17 schools who adopted the program, it was not possible to statistically analyze predictors of implementation fidelity rates.

### *Study strengths*

This study affords an improved understanding of the factors that lead to evidence-based intervention adoption and implementation in real-world settings for transition-aged youth on the autism spectrum. This type of research is critical to address research to practice gaps and has direct relevance for practice. We conducted this study in geographically and socioeconomically diverse high schools across three US states, a well-suited study context from which to answer questions related to real-world implementation of evidence-based interventions. Implementation and dissemination of research-based autism-related interventions is an understudied area, particularly during adolescence and adulthood. This study highlights the need for a continued trajectory of research focused on how to realistically provide all youth on the autism spectrum access to high-quality services across the lifespan. This must include further defining the elements of the intervention that are maximally effective, acceptable to families, and feasible to

implement across service systems with a range of pre-existing programming and socioeconomic contexts.

### *Conclusion and future directions*

This study highlights important challenges to providing family-centered evidence-based interventions in "real-world" public high school settings. Even in the presence of supports for intervention training and ongoing coaching, just over half of the schools (57%) adopted the program. Major barriers to adoption that potentially point to areas requiring further adaptation for improved fit to the school context include insufficient school-level staffing and interest to facilitate family-centered programming. Those who adopted the intervention were able to do so with an overall high level of fidelity and received positive feedback from families.

Schools that experienced the most success were those situated in higher socioeconomic contexts and those with a better quality of pre-existing autism programming related to family involvement and transition planning. This finding suggests that dissemination of the intervention in its current form could potentially result in an unintentional widening of inequities, which too often occurs in well-intended public health interventions (Victora et al., 2003). Acknowledging that the schools who did not implement Transitioning Together may have had many other important competing priorities and demands for resources, we highlight the necessity of involving community stakeholders in interventional research to ensure that the interventions being applied align with the most pressing needs and priorities of the community.

In future research, it will be important to carefully identify and address the root causes that may drive this association between school socioeconomic context, existing programming quality, and adoption of family-centered autism transition programming. This finding supports a broader call to monitor for and address inequitable uptake of evidence-based interventions in community-based settings. Had our study not intentionally recruited a wide range of high schools, these important findings could have gone undetected. To avoid the creation and dissemination of interventions that communities are inequitably able to adopt, community-based research with representative samples is key (Stahmer et al., 2017). Future work to further adapt Transitioning Together to improve its accessibility for high schools across socioeconomic contexts and existing program quality is needed. In addition to this, it is important to simultaneously study the implementation of programs like Transitioning Together in other educational, social service, and healthcare systems and settings. To broadly support successful transitions to adulthood for all youth on the autism spectrum, accessible, acceptable, evidence-based autism transition programming that centers around the family unit must be further studied and brought to scale.

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## Supplemental material

Supplemental material for this article is available online.

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