



# Pre-service Teachers' Perspectives on Transition to Kindergarten Practices for Autistic Children

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## Abstract

Autistic children present with unique challenges that may be associated with challenges during the kindergarten transition process. While teachers endorse transition to kindergarten practices as important, implementation of effective transition practices is inconsistent. One possible reason is limited training during pre-service education; however, research about this is scarce. This study examined pre-service teachers' knowledge of autism spectrum disorder (ASD) and transitions to kindergarten. Findings indicate a lack of knowledge regarding both autism and transition, as well as significant differences in knowledge of autism, wherein those seeking special education certification reported higher levels of knowledge. These results highlight training opportunities for preparing pre-service teachers to better serve young autistic children.

**Keywords** Autism spectrum disorder (ASD) · Preparation · Teachers · Transition

The transition to kindergarten signifies the beginning of increased academic demands for children compared to preschool (Rimm-Kaufman & Pianta, 2000). When children enter kindergarten, they are expected to have basic school readiness skills, often conceptualized as prerequisite intellectual, physical, and social skills to allow for kindergarten success (Montes et al., 2011). Although transitioning into kindergarten may be successful for some students, others struggle, and autistic<sup>1</sup> children are particularly at risk for such challenges (Marsh et al., 2017). Autistic children face challenges demonstrating school readiness skills such as social, emotional, language, literacy, and executive functioning skills, reflecting their individual social, communication, and behavioral presentations (Sparapani et al., 2016). Many autistic children also display behavioral or emotional difficulties when adjusting to the unpredictability associated with changes in routines and new settings (Chen et al., 2020; Larcombe et al., 2019), as well as trouble generalizing skills (APA, 2013; Forest et al., 2004), making the transition to

new environments difficult. A successful transition is important, as it influences social-emotional adjustment, well-being, and academic success throughout school (Chen et al., 2020; Welchons & McIntyre, 2017). The unique challenges children on the autism spectrum face during the transition to kindergarten highlight the need for kindergarten teachers to be prepared to collaborate with parents, preschool teachers, and other service providers to implement transition practices that meet children's needs (Marsh et al., 2017).

## Theories for Understanding Transition

The Ecological and Dynamic Model of Transition (Rimm-Kaufmann & Pianta, 2000) conceptualizes transitions as relying on effective systems and supports, rather than success residing solely within the child, underscoring the importance of collaboration between people across settings (Rimm-Kaufmann & Pianta, 2000). One implication of this systems-focused conceptualization of transition is that kindergarten teachers must understand the unique needs autistic children have during the transition to kindergarten.

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<sup>1</sup> Throughout this paper identity-first language (e.g., "autistic child") is used. However, the authors recognize that there are varying language preferences among those in the autistic community, which may include person first language or other person-first formulations (e.g., "child with autism", "child on the autism spectrum") (Bottema-Beutal et al., 2021; Vivanti 2020).

Previous research highlights gaps in teachers' understanding of transition practices and autism in general (Forest et al., 2004). Such gaps are evident even before teachers enter the field, as pre-service teachers lack sufficient exposure to autism-related training (Barned et al., 2011; Sans Cervera et al., 2017). What pre-service teachers learn and are trained in is critical because their pre-service training and experience ultimately influence in-service practices (Lauderdale-Litten & Brennan, 2018). Based on the Theory of Planned Behavior (Ajzen, 1991), attitudes, subject norm beliefs (i.e., how others value certain behaviors), beliefs about being able to carry out a particular behavior, and knowledge about an intended behavior are precursors to actual execution of the behavior. With this in mind, the first step in better preparing teachers to carry out effective transition-to-kindergarten practices with young children who have autism is understanding the knowledge and beliefs of pre-service teachers.

## Teacher Factors That Influence the Transition to Kindergarten for Autistic Children

### Knowledge of Transition Strategies

To date, there is very limited research about pre-service teachers' knowledge of transitions for autistic children. Yet, research on in-service teachers' knowledge of transition strategies suggests that a lack of recognition of transition strategies and lack of preparation during teacher training may contribute to difficulties encountered during the transition to kindergarten (Chen et al., 2020). Recent studies highlight that although most teachers rate practices as important, few can explain why they had chosen their ratings for the transition practices, and it is unclear how this is related to the implementation of transition practices (Beamish et al., 2014; Denkyirah & Agbeke, 2010).

There is a theme in the literature suggesting that teachers may lack awareness of transition strategies and may not understand individual transition needs (Nuske et al., 2018). While teachers may rate transition practices as important, it seems they may have limited knowledge about effective high-intensity transitions (Nuske et al., 2018). As a result, transitions for autistic children are often not individualized and not implemented as often as they should be (Rous & Hallam, 2012). Taken together, these studies suggest that in-service teachers are lacking knowledge and awareness of transition strategies for autistic children which may limit the use of effective transition practices for autistic children. This underscores the importance of understanding pre-service teachers' knowledge about how to support autistic children during the kindergarten transition to adequately dress this gap in training and knowledge before teachers enter the field.

### ASD Knowledge

In addition to limited training in transition practices, both pre-service and in-service teachers, alike, often report limited understanding of ASD (Fontil et al., 2019; Fontil & Peatrokos, 2015). Perhaps unsurprisingly, differences in ASD-specific knowledge have been noted between general education and special education pre-service teachers specifically, with pre-service teachers who specialize in special education reporting fewer misconceptions about ASD (Sans-Cervera et al., 2017).

Early childhood and early elementary pre-service teachers indicate a lack of knowledge about ASD and how to work with and support students on the autism spectrum. In fact, a survey study of pre-service teachers revealed that most were unaware that ASD was a developmental disorder and believed that children could out-grow ASD (Barned et al., 2011). Other similar studies of pre-service teachers' ASD knowledge have found that many pre-service teachers confused symptoms of ASD with those of other diagnoses and held inaccurate beliefs about its presentation (Johnson et al., 2012; Sans-Cervera et al., 2017).

Pre-service teacher training about ASD often occurs only within an introduction to special education course (Sans Cervera et al., 2017). Only 15% reported having received training in their undergraduate teacher preparation programs, with most of their ASD knowledge gained from one-day workshops, teaching themselves, or trial and error in the field (Morrier et al., 2011). Not surprisingly, pre-service teachers have also expressed a desire for more knowledge about ASD (Barned et al., 2011; Hamrick et al., 2021).

The availability and quality of training and education about ASD in higher education may vary depending on state regulations and the type of certifications teachers are seeking (e.g., special education vs. general education). However, since, in-service training may influence teachers' knowledge and beliefs about the transition to kindergarten, research in this area is warranted. Indeed, pre-service teacher training has been documented to influence in-service teacher behavior, including the number and quality of strategies used to support autistic children (Chen et al., 2020; Segall & Campbell, 2012). Changing pre-service teachers' beliefs and focusing on self-efficacy during training have been suggested to shape in-service teaching practices (MacFarlane & Woolfson, 2012).

## Purpose of the Current Study

Several studies have examined perspectives of in-service teachers regarding the transition to kindergarten (e.g., Fontil et al., 2019; Quintero & McIntyre, 2011). However, few have focused on empirically examining the knowledge and beliefs pre-service teachers hold about the transition to kindergarten for autistic children that could influence their in-service practices even though previous studies suggest that pre-service teachers' knowledge and preparation may affect the transition to kindergarten (e.g., Morrier et al., 2011; Sans-Cervera et al., 2017). The purpose of this study was to better understand pre-service teachers' knowledge and attitudes regarding transition to kindergarten practices for autistic children. The current study addressed the following research questions:

1. What do pre-service teachers know about ASD and about the transition to kindergarten for autistic children?
2. What are pre-service teachers' attitudes regarding kindergarten transition practices for autistic children?
3. Do pre-service teachers' knowledge of ASD, knowledge of transitions, and ratings of transition practices' importance, differ based on teaching certification being sought (e.g., special education compared to general education)?

## Methods

### Participants

Participants were 71 pre-service teachers from 16 universities across the United States who were in the final year of their teacher training programs (i.e., seniors). Eligible participants were education or teaching majors seeking certification in early childhood education, early childhood and elementary education generalist, early childhood and elementary education bilingual, special education early childhood education, early childhood to early elementary education, or special education. Students seeking certification in teaching grades 4–8 or 8–12 were excluded because of the focus on kindergarten transition practices.

There were 158 participants who began the survey; however, 53 did not meet inclusion criteria (i.e., seeking a different certification or not in final year of training). A total of 105 participants met screening criteria, and 71 fully completed while 18 partially completed the survey; only data from respondents with complete data were included. Demographic information is included in Table 1. Most respondents were female, White, and between the ages of 18–24. Most participants were seeking general

**Table 1** Demographics of Participants

Demographic Characteristics	N	Percentage
Gender		
Female	64	90.1
Male	7	9.9
Age		
18–24	54	76.1
24–35	13	18.3
35 and up	4	5.6
Race		
White	54	76.1
Black or African American	3	4.2
Alaskan Indian or Alaska Native	3	4.2
Asian	2	2.8
Other	9	12.7
Ethnicity		
Non-Hispanic or Latino	55	77.5
Hispanic or Latino	16	22.5
Teacher certification being sought		
Early childhood elementary education generalist	47	66.2
Early childhood elementary Education bilingual	6	8.5
Early childhood elementary Education with special education concentration	6	8.5
Special education	12	16.9
Taken special education courses	55	77.5
Has had ASD specific training	35	49.3
Has had experience with students with ASD	54	76.1
Is a parent	8	11.3
Experience working in a special education classroom		
Volunteering	25	35.2
Working	26	36.6
Observing	35	49.3
No experience	20	28.2

education teacher certification and had taken coursework related to special education. About half reported having general training related to ASD, and most reported some experience with autistic students.

## Measures

### Demographics

Demographic information included gender, race, ethnicity, and age. Questions about previous careers and whether the participant was a parent were also included. Participants were also asked what kind of teaching certificate they were seeking and their current stage of the teacher education program. Prior related coursework and experience working in special education classrooms for autistic children were also

**Table 2** List of Measures

Measure Name	Number of Items	Type of response	Examples of items
Demographics	15	Multiple choice	<ol style="list-style-type: none"> <li>1. Have you taken any coursework focused specifically on special education ?</li> <li>2. Have you had any experience with students who have autism spectrum disorder (also known as ASD, but may be called autism, Autistic Disorder, Asperger's, PDDNOS)?</li> </ol>
Teacher Knowledge of ASD and Transition Practices	Knowledge of ASD: 19	True or false	1. Traumatic experience very early in life can cause ASD. (false)
	Knowledge of Transitions: 12	True or false	2. Only special education teachers can facilitate school transitions for children with ASD (false)
Teacher Importance of Transition Practices for Children with ASD	18 items	5 point Likert- scale("Not Important" to "Very Important")	<ol style="list-style-type: none"> <li>1.The kindergarten and preschool teachers work together to identify the instructional curriculum before the transition</li> <li>2.The kindergarten teacher has adjusted the physical environment for sensory adaptations at the transition</li> </ol>
Teacher Importance of Transition Practices for Children with ASD—open ended question	1 item	Free response	1. Which transition practice is the most important and why?

queried. Additional information about this measure is listed in Table 2.

### Teacher Knowledge of ASD and Transition Practices

The *Teacher Knowledge of ASD and Transition Practices* measure was created to measure pre-service teachers' knowledge about ASD (symptoms, presentation, etiology) and practices that facilitate the transition to kindergarten for autistic children. This measure assessed participants' knowledge in the respective areas by asking them to identify whether statements were "true", "false" or "I don't know". Answers were coded as correct (1 point), incorrect (0 points) or "I don't know" (0 points). The items from each section were summed, to yield a Total Knowledge of ASD scores and a Total Knowledge of Transition Practices scores, with higher scores representing greater knowledge.

This measure that was created modified the Knowledge section of the *Autism Inclusion Questionnaire: The Teacher Form* (Segall, 2011), which contains 15 items that assess knowledge about ASD, ( $\alpha=0.86$ ), by adding items to create a measure that included specific questions about ASD and transitions to kindergarten for autistic children. The added items were identified through a search of literature published between 2004–2019, using terms entered into EBSCOhost including "transition", "kindergarten", "knowledge", and "autism". Based on careful review of the resulting articles, a list of knowledge points about ASD and transition practices

for autistic children was constructed. More information on this measure is listed in Table 2.

### Teacher Importance of Transition Practices for Autistic Children

To assess pre-service teachers' perceptions of the importance of various transition practices for autistic children, modified versions of the *Teacher Perceptions on Transition* (TPOT) (Quintero & McIntyre, 2011) and *Elements for Transition to Kindergarten* (ETK) (Forest et al., 2004) were combined. Modifications to these measures included changed wording to accommodate the limited teaching experience of pre-service teachers by assessing perceived importance of the listed transition practices, instead of actual implementation. For example, the ETK asks teachers to rate their experience with the transition elements, but this part of the measure was removed for the current study since pre-service teachers have limited in-classroom experience. Further, the TPOT has teachers rate how often they implement and are involved in transition practices with a student, but this was modified to query the perceived importance of the transition practices.

The resulting measure, the Teacher Importance of Transition Practices for Autistic Children, measured the perceived importance of specific transition practices that have been established to support autistic children, on a Likert scale of 1 to 5. Higher ratings indicated greater perceived importance. Scores for each item were totaled, yielding a Total

**Table 3** Descriptive Statistics for Knowledge of ASD, Knowledge of Transitions, and Importance Total Scores

Variable	Total number of items	Mean	Median	SD	Min	Max	Skewness	Kurtosis
Knowledge of ASD total score	19	11.24	12.00	3.19	3.00	16.00	−50	−48
Knowledge of transitions total score	12	7.63	8.00	2.30	1.00	12.00	−75	−45
Importance of transition practices total score	18	77.41	79.00	8.92	46.00	90.00	−88	1.25

Importance of Transition Practices score. Further information about the measure can be found in Table 2.

## Procedures

Once the survey (which included all measures in Table 2) was developed, it was reviewed and revised by an autism-focused research team from the authors' institution. After IRB approval, approximately 10 teacher education programs at universities near a large city in the southeastern United States were asked via email to disseminate the study survey to their students; six agreed. Participants were also recruited through student teacher social media groups. Potential participants were provided a link to the survey in Qualtrics and answered screening questions before beginning the survey to ensure study eligibility. Questions included their age, enrollment in a teacher education program, teaching certification they are seeking, and their current progress through their program.

Eligible participants were then given a study description, and those who consented to participate were asked for demographic information, and presented with the measures in the following order: demographics, *Teacher Knowledge of ASD and Transition Practices*, and *Teacher Importance of Transition Practices for Autistic children*. Within each measure, questions were administered in random order to decrease the likelihood that participants answered the survey questions based on answers to previous questions or answered in a way that makes the participant look more desirable. After survey completion, participants could choose to receive either class extra credit (if offered by their instructor), or be entered in a raffle to win a \$25 Amazon gift card.

## Data Analysis

Descriptive statistics were used to explore pre-service teachers' knowledge about autism, knowledge about transitions, and perceived importance of transition practices. A MANOVA was used to examine mean differences between Total Knowledge of ASD Scores, Total Knowledge of Transition Practices Scores, and Total Importance of Transition Practices scores by type of teaching certification.

## Results

### Knowledge of ASD

Pre-service teachers responded to 19 items about knowledge of ASD in the *Teacher Knowledge of ASD and Transition Practices* measure. The mean Total Knowledge of ASD score was 59% (see Table 3). Survey responses revealed that most pre-service teachers knew students with ASD often have difficulty with social interactions (87.3%); exhibit restrictive interests and repetitive behaviors (93%), and have difficulties with transitions (90.1%). Pre-service teachers also reported understanding the wide variability in ASD presentation across children (81.7%).

Several misconceptions and misunderstandings about ASD were also reported by participants. Pre-service teachers' responses to the statement "ASD is a developmental disorder" revealed that more than a third did not know (36.6%), while 15.5% responded that this statement was false. Similar proportions endorsed the erroneous statement that traumatic experiences very early in life can cause ASD (12.7%) or did not know if this was true or false (36.6%). When asked whether genetic factors play an important role in the cause of ASD, 12.7% of pre-service teachers answered "false" and 35.2% answered, "I don't know." However, 69% of pre-service teachers did endorse that the cause of ASD is often unknown. Pre-service teachers also reported misconceptions about the presentation and characteristics of ASD. When asked about the core symptoms of ASD, 69% endorsed imprecise descriptions of these, while 28.2% were unsure. Moreover, 67.6% of pre-service teachers erroneously held the belief that most autistic children have special talents or abilities. Additionally, 23.9% of pre-service teachers believed that the majority of autistic children have an intellectual disability (ID), and 38% of pre-service teachers answered, "I don't know". Pre-service teachers also expressed a lack of clarity about whether medication can alleviate core symptoms of ASD, with 43.7% of pre-service teachers indicating they were unsure. Lastly, pre-service teachers indicated they were unsure of the current prevalence of ASD. When asked whether 1 in 300 children are diagnosed with ASD, 64.8% of the sample was unsure, and 19.7% believed this was true.

## Knowledge about Transition Practices for Autistic Children

Pre-service teachers were asked 12 items about knowledge of transitions for autistic children via the *Teacher Knowledge of ASD and Transition Practices* measure. On this measure, 63% of items were answered correctly (see Table 3). Almost all pre-service teachers in the sample agreed that teachers need to be involved in the transition process (85.9%) and that transition from preschool to kindergarten is important for social, academic, and behavioral outcomes for autistic children (81.7%). Further, pre-service teachers displayed some understanding of the unique transition needs of students with ASD such as adapting the classroom (93%), and that not all students with ASD will benefit from the same transition practices (85.9%).

Results indicated, however, that it was unclear to pre-service teachers who was responsible for facilitating transition practices for students with ASD, as nearly half (43.7%) of respondents felt it was the responsibility of special education teachers, and 35.2% were not sure if it was the special education teacher's responsibility. In addition, when asked whether preschool teacher involvement was more important than kindergarten teacher involvement, over a third of pre-service teachers were unsure (39.4%), and 15.5% erroneously believed it was true. Regarding specific transition practices, 62% of pre-service teachers also wrongly believed sending letters home and open houses were sufficient. Lastly, more than 60% of participants correctly recognized that transition practices for autistic children need to begin before kindergarten (Marsh et al., 2017), but 16.9% did not, and 22.5% did not know.

## Perceived Importance of Transition to Kindergarten Practices

Pre-service teachers were asked to rate the importance of 18 transition practices on the *Teacher Importance of Transition Practices for Autistic Children* measure. Results reflected an average rating of 4.3 (of 5) per item, or "Important" on the Likert scale for all items (see Table 3). Pre-service teachers agreed that adjusting the physical environment for sensory needs (63.4% "Very Important", 25.4% "Important") and creating a daily schedule (71.8% "Very Important", 23.9% "Important") were needed modifications. Pre-service teachers also viewed collaboration as a central, endorsing the importance of holding transition planning meetings with parents, school administration, and teachers (70.4% "Very Important", 23.9% "Important"), as

well as frequent contact with parents during the transition process (66.2% "Very Important", 28.2% "Important").

Although most transition practices were rated as high in importance, teachers rated some transition practices lower. For example, only 14.1% rated the practice of the kindergarten teacher completing a home visit before the transition begins as "Very Important" or 23.9% "Important". Similarly, regarding the preschool teacher visiting the kindergarten classroom before the transition, only a third (32.4%) of pre-service teachers rated this "Very Important". Lastly, although many pre-service teachers endorsed frequent parent-teacher contact as "Very Important", only a third (33.8%) indicated that preschool teacher contact with parents about the transition before it begins is "Very Important".

## Perceived Importance of Specific Practices

Of the 71 pre-service teachers surveyed, 68 provided open-ended responses and 29 included *why* they found the transition practice they listed as important. Twenty-eight of the 29 participants who completed the open-ended question (97%) indicated that creating a sense of familiarity and routine in the new classroom is the most important transition practice, providing comments such as "it ensures a sense of safety for the student", "ASD students feel better with routines", and "so they are not overwhelmed." Twenty of the 29 open-ended responses addressed the need for communication between teachers, parents, and staff (69%). Two pre-service teachers thought ASD-related training for teachers was the most important transition practice. One pre-service teacher explained why this was important and cited a personal account:

"I think the most important practice is having the teacher go to a training specifically catered about individuals with autism. Referring back to my experience, I had absolutely no idea of what I was getting myself into before having to work with the students that had autism. I caught on quickly but feel like I would have been better prepared if I had gotten some sort of training and knowledge in general."

## Differences in Transition Beliefs and Knowledge Based on Teaching Certification

There was a significant effect of teaching certification type on knowledge of ASD, knowledge of transitions for autistic children, and perceived importance of transition practices for autistic children (Roy's  $F = 10.17$ ,  $p < 0.001$ ,  $\eta^2 = 0.313$ ). The observed statistical power of the analysis with an alpha of 0.05 was 0.998. Welch's ANOVA test indicated significant effects of types of teaching certification sought on

**Table 4** Means and standard deviations of pre-service teacher knowledge, and importance scores by type of teaching certification being sought

Total score	Teacher Certification Type								<i>F</i>	<i>p</i>
	Generalist ( <i>n</i> = 47)		Bilingual ( <i>n</i> = 6)		Special Education ( <i>n</i> = 12)		Generalist with Special Education Concentra- tion ( <i>n</i> = 6)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Knowledge (ASD)	10.68	2.99	8.00	2.30	13.58	2.02	14.50	1.05	18.00	< .001**
Knowledge (Transitions)	7.48	6.83	6.83	2.64	7.58	1.88	9.67	1.97	1.95	.13
Importance	79.96	10.00	80.00	7.10	81.25	5.96	78.5	2.51	1.80	.179

\*\*Represents statistically significant difference

knowledge of ASD total scores ( $p < 0.001$ ). The means and standard deviations of pre-service teachers' scores on the above measure by type of teaching certification are included in Table 4. Tamhane's T2 post hoc tests indicated that pre-service teachers seeking a special education certification had significantly higher scores on knowledge of ASD compared to those seeking a general education ( $p < 0.05$ ) or bilingual education certification ( $p < 0.05$ ). Pre-service teachers seeking a general education certification with a special education concentration had significantly higher scores on knowledge of ASD compared to those seeking a general education ( $p < 0.001$ ) and bilingual education certification ( $p < 0.05$ ).

## Discussion

Teachers are central figures for facilitating children's transition to kindergarten, but current literature suggests they do not implement individualized and comprehensive practices that facilitate these transitions for autistic children (Chen et al., 2020; Fontil et al., 2019). This is concerning because ineffective transition practices decrease the likelihood of a successful transition, which is known to have negative long-term social, emotional, and academic implications (Marsh et al., 2017; Rimm-Kauffman & Pianta, 2000). There are several key findings from this study that suggest pre-service teachers may complete their training without the skills or knowledge needed to understand and effectively implement transitions-to-kindergarten for autistic children.

Consistent with past research (e.g., Beamish et al., 2014; Denkyirah & Agbeke, 2010), one of the main findings from this study was that most pre-service teachers endorsed transition practices as important. While it is encouraging that pre-service teachers rated transition practices as important, findings indicate that most pre-service teachers surveyed held misconceptions or were unclear about the characteristics and presentation of ASD. For example, over half of the pre-service teachers surveyed were unsure even about the core symptoms of autism. As autism prevalence rates

continue to rise, it is increasingly important that pre-service teachers are prepared to support autistic students, which may be less likely if they do not understand the presentation and diagnosis (Chen et al., 2020). Additionally, autistic children are much less likely to present with an intellectual disability compared to what pre-service teachers in this study believed; the majority of children with ASD do not have comorbid intellectual disability (Maenner et al., 2020).

Most pre-service teachers surveyed also held misconceptions about the transition to kindergarten. This was consistent across different types of certifications, suggesting that pre-service teachers may enter the field unaware of what makes an effective transition to kindergarten for this population. Not only do results suggest a lack of clarity surrounding the likelihood of having a student with ASD in their classroom, but also potential confusion about which personnel are responsible for facilitating transition; almost half of the participants erroneously thought this was solely the responsibility of special education teachers. With regard to effective practices, more than half of participating pre-service teachers endorsed that sending letters home and holding open houses were sufficient transition practices. However, research has proven these ineffective compared to individualized, in-person communication (Pianta et al., 2001).

Lastly, this study provides new information suggesting that pre-service teachers seeking a special education certification held higher levels of knowledge of ASD compared to those seeking other teaching certifications. However, there were no differences between types of teaching certifications in the perceived importance of transition practices or knowledge about transition to kindergarten for autistic children. This information is important given the high increase in school-based autism identification. Cardinal et al. (2021) found that the number of students that met the eligibility criteria for autism in six states has risen by 684% since 2001, which increases the likelihood of autistic students being educated in general education classrooms. Indeed, in the fall of 2018, 40% of autistic children spent 80% or more of their time in school in general education settings (U.S.

Department of Education, 2021). Together, these findings underscore that regardless of certification (e.g., special education or general education), it is important for all pre-service teachers to learn about ASD, and that there are specific opportunities to increase knowledge of transition practices for autistic children across teaching certifications.

## Implications for Practice

Results of this study have implications for practice with regards to supporting both pre-service and practicing (in-service) teachers, professionals who are an integral part of autistic children's school experiences and outcomes. First, it is important to positively influence all pre-service teachers' views and knowledge about the transition to kindergarten for autistic children, not just special education teachers. It may be helpful for those training pre-service teachers to examine differences in curriculum, courses, expectations, and experiences offered to pre-service teachers seeking special education certification, and offer these to pre-service teachers seeking other certifications. Options for sharing information could include guest lectures or speakers, as well as case-based learning wherein pre-service teachers are guided to consider what practices they would use to support autistic children transitioning to kindergarten. These options would offer an opportunity to gain knowledge and create a culture that emphasizes the importance of learning about this topic.

However, we recognize that teacher training and preparation varies across states and districts, as well as within certification types. It may, therefore be difficult for higher education programs to address this gap. Thus, in-service trainings or professional development for all teachers and educators who may be involved in transitions for students with ASD are suggested. Such professional development sessions should include information about differences autistic children may experience during transitions to kindergarten, how to implement effective transition practices, and how to modify or adapt the classroom for children's unique needs. Moreover, effective collaboration and communication strategies with families should be reviewed within districts in order to inform the development of guidelines to help teachers take steps that facilitate the transition process. Holding in-service training sessions about autism and the transition to kindergarten may lead to a better understanding of the needs of this population and, ultimately, enhanced outcomes for children. Additionally, collaboration with other professionals specifically trained in working with this population (e.g., psychologists, developmental pediatricians, special education teachers with autism specialization) may also serve as resources who can aid in disseminating information about ASD and the transition to kindergarten for in-service teachers.

There is also a growing movement toward conceptualizing ASD and other developmental disabilities through a neurodiversity lens, including in schools, where the unique attributes of autistic individuals and those with developmental disabilities are celebrated (Smagorinsky, 2020). Training teachers to view autism through this lens may help shift beliefs and attitudes about autism (Gobbo et al., 2019). The knowledge and beliefs held by pre-service teachers, as examined in this study, are a critical part of this process. Developing trainings and experiences aimed at increasing pre-service teachers' understanding of ASD may help decrease misconceptions about the diagnosis, thereby facilitating more positive transitions.

## Implications for Research

Findings from the current study suggest opportunities to increase pre-service teachers' knowledge about this population that, if unaddressed, may negatively influence transitions for young autistic children. Therefore, to help future teachers best serve children on the autism spectrum during the transition to kindergarten, future researchers should draw from the findings of this study to develop, implement, and examine the effectiveness of interventions to increase knowledge about ASD and the transition to kindergarten for this population. Specifically, researchers should investigate the effects of interventions (e.g., guest lectures for pre-service teachers that are targeted at disseminating knowledge about autism and the transition to kindergarten for this population) to evaluate what approaches are most effective. Collecting pre-post measures about knowledge (such as the measures used in the current study), for example, could help assess the effectiveness of such interventions for developing both pre-service and in-service teachers' autism knowledge. Other data collection approaches with in-service teachers (e.g., systematic observations of teacher-parent interactions, collecting data from parents about their transition experiences, directly and longitudinally assessing children for successes during kindergarten and beyond) are necessary future directions, as well. When considering ways to support teachers' implementation of new strategies, researchers should also consider feasibility and acceptability to enhance the likelihood that effective strategies are implemented.

The current study highlights opportunities to increase knowledge about autism and the transition to kindergarten for autistic children, with the understanding that knowledge may influence actions (e.g., use of transition practices) once pre-service teachers are in-service (Azjen, 1991). However, there are other factors such as discrimination and biases which may impact the experiences of young autistic children and their families during the transition to kindergarten. Future research examining the perspectives of parents,



specifically ethnically, culturally, and linguistically diverse families is also warranted. Language barriers, systemic racism, and discrimination may negatively affect marginalized families' experiences in accessing transition services, as Black, Latino, and immigrant families have reported receiving less information about transition services and programs compared to other families (Smith et al., 2021; Starr et al., 2016). Given the importance of family-school partnerships for the transition process, further research should prioritize the investigating experiences of marginalized families who have young autistic children as well as the effects of systemic racism and teacher biases during the transition to kindergarten process.

## Limitations

The results of this study must be interpreted in the context of several limitations. First, the participants represent a fairly homogeneous sample with 76% of pre-service teachers surveyed identifying as White and most reporting as female. While this mirrors the demographics of teachers in the United States, it is still important to consider that a more culturally diverse sample would have allowed for more diverse perspectives (National Center for Education Statistics, 2021). To help teachers best serve young autistic children, the experiences and insights of pre-service teachers of all races, ethnicities, and locations, including from both rural and urban settings would be valuable. Another limitation is that due to the Covid-19 pandemic, participants were recruited virtually via listservs and social media groups instead of surveys being administered in person at select universities. This created challenges in differentiating the training programs participants came from, thus it was not possible to differentiate between the various training programs and teaching standards used in those settings. Potential differences among training programs in the curriculum and training experiences they offer related to special education and autism may have impacted study responses and should be considered in future studies. In addition, the measures used in this study were either investigator-developed or modified to be applicable to the pre-service teacher population. Though this was done because no other measures existed that adequately captured the constructs of interest; technical adequacy information was not available but should be considered in future work.

## Conclusion

The current study focused on pre-service teachers' understanding and perceptions about the transition to kindergarten for autistic children. Research suggests pre-service teachers

may not be prepared to facilitate transitions to kindergarten for these students (Barned et al., 2011; Sans-Cervera et al., 2017), resulting in inadequate engagement in transition practices or the use of ineffective approaches (Chen et al., 2020; Fontil et al., 2019; Forest et al., 2004). To our knowledge, this study is the first to examine knowledge of transitions, knowledge of ASD, and the importance of transition practices among pre-service teachers. The results highlight teacher training-related opportunities to address the needs of young autistic children during the critical transition to kindergarten, which ultimately can promote positive academic, social, and behavioral outcomes in young autistic children.

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