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DISORDER (ASD) AS IT RELATES TO ACCURACY OF SYMPTOM
IDENTIFICATION**

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PRESCHOOL TEACHERS' KNOWLEDGE OF AUTISM SPECTRUM DISORDER
(ASD) AS IT RELATES TO ACCURACY OF SYMPTOM IDENTIFICATION

A dissertation submitted in partial fulfillment
of the requirements for the degree of

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at

ST. JOHN'S UNIVERSITY

New York

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Date Approved _____

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ABSTRACT

PRESCHOOL TEACHERS' KNOWLEDGE OF AUTISM SPECTRUM DISORDER (ASD) AS IT RELATES TO ACCURACY OF SYMPTOM IDENTIFICATION

Jessica Prizer

Although most children with autism spectrum disorder (ASD) are not diagnosed until after four years of age, they can and should be identified much earlier. Given that preschool teachers repeatedly observe children in social contexts, they are in a unique position to aide in the early identification of ASD, which can prompt the initiation of intervention services that mitigate levels of disability. Few studies exist that examine preschool teachers' knowledge of ASD in the United States and no study to date has researched the relationship between knowledge and accuracy of symptom identification in this population. The current study aimed to examine key demographic variables related to preschool teachers' knowledge of ASD in the U.S., whether preschool teachers' knowledge relates to symptom identification, if ASD mediates the relationship between key variables and accurate symptom identification, and whether ASD knowledge is associated with teachers' likelihood of informing caregivers of identified concerns. Results demonstrated that education level, prior ASD-focused training, previous exposure to students with ASD, and special education teaching experience were significantly correlated with ASD knowledge. Further, ASD knowledge was significantly correlated with symptom identification accuracy and it significantly mediated the relationship between key variables (e.g., education level, prior training) and accurate symptom identification. Lastly, results showed that ASD knowledge was correlated with likelihood to inform caregivers of behaviors for vignettes depicting students with ASD

symptomatology. These findings build upon existing literature on ASD knowledge in the preschool teacher population and have important implications for training, school psychology, and clinical practice.

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TABLE OF CONTENTS

Acknowledgements	ii
List of Tables	vi
List of Figures	vii
Introduction	1
Description and Prevalence of Autism Spectrum Disorder (ASD)	2
Early Identification of ASD and Intervention	3
Barriers to Early Identification of ASD	4
Preschool Teachers' Role in Early Identification	5
ASD Knowledge Among Non-Preschool Teachers	6
Current Preschool Teacher Knowledge of ASD	7
Teacher Challenges to Early Identification of ASD	9
Knowledge and Symptom Identification	11
Present Study	12
Research Questions	12
Hypotheses	13
Method	16
Participants	16
Measures	16
Procedure	20
Results	21
Missing Data	21
Participant Demographics	21

Independent, Dependent, and Mediating Variables	21
Statistical Procedures	22
Descriptive Statistics	24
Hypothesis 1	24
Hypothesis 2	24
Hypothesis 3	25
Hypothesis 4	27
Supplemental Analyses	28
Discussion	29
Strengths, Limitations, and Future Directions.	34
Implications for School Psychology.	39
Appendix A: Recruitment Post	51
Appendix B: Consent Form.	52
Appendix C: Demographics Questionnaire	53
Appendix D: Autism Spectrum Knowledge Scale General Population (ASKSG).	57
Appendix E: Case Vignettes.	59
References	65

LIST OF TABLES

Table 1. Demographic and Professional Characteristics of Sample of Preschool Teachers (N=326)	41
Table 2. Descriptive Statistics of ASD Knowledge and Symptom Identification. . .	43
Table 3. Inter-Correlations Between Teacher Characteristics and ASD Knowledge. 44	
Table 4. Comparisons in Mean ASKSG Score and Likelihood of Informing Caregivers Based on Case Vignettes	45
Table 5. Hierarchical Regression of Independent Variables' Prediction on Accuracy of Symptom Identification.	46

LIST OF FIGURES

Figure 1. Teacher education level and accurate symptom identification as mediated by ASD knowledge	47
Figure 2. Previous exposure working with children with ASD and accurate symptom identification as mediated by ASD knowledge.	48
Figure 3. Prior ASD-focused training and accurate symptom identification as mediated by ASD knowledge.	49
Figure 4. Special education (SpEd) teaching experience (past or present) and accurate symptom identification as mediated by ASD knowledge.	50

Introduction

Over the past two decades, the number of children identified as having autism spectrum disorder (ASD) has increased substantially, with 1 in 44 children currently identified as having the disorder (Maenner et al., 2021). Although most children are not diagnosed with ASD until after four years of age (CDC, 2021; Maenner et al., 2020), there is increasing evidence that clinicians can reliably diagnose children with ASD as early as 18-24 months (Barbaro & Dissanayake, 2017; Larsen et al., 2019; Webb & Jones, 2009; Zwaigenbaum et al., 2015a, 2015c), with a recent study suggesting diagnostic stability at the age of 14 months (Pierce et al., 2019). A diagnosis of ASD enables the initiation of intervention services which are crucial to improving a child's developmental trajectory including outcomes related to cognition, language, adaptive behavior, and social behavior (Arif et al., 2013; Dawson et al., 2010; Elder et al., 2017; Remington et al., 2007; Vivanti et al., 2016). As a result, there is a great need to minimize the gap between when symptoms can first be recognized and when children receive a diagnosis of ASD (Elder et al., 2017).

There are a number of factors that influence the delay in diagnosis and subsequent intervention for children with ASD. While pediatricians are primarily relied on for the identification of young children with ASD, they often lack specific training, have difficulty following routine screening procedures, and do not necessarily recognize concerns due to the limited time frame of health check-ups (Branson et al., 2008; Coury, 2015; Dosreis et al., 2006; Finke et al., 2010; Gabrielsen et al., 2015; Shah, 2001). As a result, there is a need to turn to other professionals who work regularly with children, such as early childcare workers and preschool teachers, to assist in the early identification

of children with ASD. Preschool teachers are in a unique position to identify symptoms of ASD in young children, as they are able to repeatedly observe children socially interacting with one another during the period in which ASD symptoms are first recognizable (Branson et al., 2008; Larsen et al., 2018). However, while current research on preschool teachers' knowledge of ASD is variable, it generally reflects a lack of ASD knowledge among this population (Lian et al., 2008; Liu et al., 2016; Taresh et al., 2019).

The aims of the present study are to examine (a) whether key demographic variables (e.g., education level, prior training in ASD) are related to preschool teachers' knowledge of ASD, (b) whether preschool teachers' knowledge of ASD relates to accuracy of symptom identification using case vignettes and (c) if this knowledge is associated with teachers' likelihood of informing parents and/or caregivers of identified concerns. The current study aims to build upon existing research by also exploring whether ASD knowledge mediates the relationship between key variables and accurate symptom identification. Results of this study can highlight potential areas of need for teacher training and further contribute to a growing body of literature concerning early assessment and intervention for children with ASD (Liu et al., 2016). Additionally, because the preschool period is when most children with ASD are diagnosed, increased knowledge of ASD-like behaviors and prevalence in this age group could improve clinical decisions (Rescorla et al., 2019).

Description and Prevalence of Autism Spectrum Disorder (ASD)

ASD is a pervasive neurodevelopmental disorder that is characterized by impairments in social communication and restricted, repetitive patterns of behavior and interests (American Psychiatric Association, [APA], 2013). Given that ASD is

characterized as being a spectrum disorder, the symptoms fall on a continuum, with some individuals showing mild symptoms and others having more severe symptomatology (Lord et al., 2018). Over the past two decades, the number of children identified as having ASD has increased substantially and it has become one of the fastest growing developmental disabilities in the United States (Sansosti & Sansosti, 2013). The disorder is reported to occur in all racial, ethnic and socioeconomic groups and is four times more common among boys than girls (CDC, 2016; Maenner et al., 2020).

Early Identification of ASD and Intervention

Parents of children with ASD often report developmental delays and social deficits before their child's first birthday, as behavioral signs can be detected as early as one (Baio et al., 2018; Charman & Baird, 2002, Larsen et al., 2019; Mandell et al., 2005; Zwaigenbaum et al., 2013). Researchers have developed effective screening and diagnostic instruments to reliably identify and monitor the early signs of ASD in children younger than 2 years of age (Robins et al., 2014) and, recently, as early as 14 months (Pierce et al., 2019). As mentioned above, despite our increasing ability to identify the early signs of ASD, most children do not receive a diagnosis, on average, until after four years of age (APA, 2017; Maenner et al., 2020; Zwaigenbaum et al., 2015b). As a result, there is a great need to minimize the time between symptom presentation and when children receive a diagnosis of ASD (Elder et al., 2017).

Reducing the gap between identification and diagnosis is crucial to improving long-term outcomes related to cognition, language, adaptive behavior, daily living skills, and social behavior for children with ASD through early intervention (Dawson et al., 2010; Elder et al., 2017; Remington et al., 2007; Vivanti et al., 2016). A diagnosis of

ASD enables the initiation of intervention services which can improve a child's developmental trajectory and mitigate their levels of disability, leading to a better quality of life (Boyd et al., 2010; Dawson et al., 2010; Eaves & Ho, 2004; Elder et al., 2017; Zwaigenbaum et al., 2015b). Interventions that improve functioning are more beneficial when delivered at younger ages, as evidence suggests that earlier treatment optimizes long-term prognosis and that treatment yields diminish as children with ASD get older (Granpeesheh et al., 2009; MacDonald et al., 2014; Perry et al., 2011; Smith et al., 2015). Specifically, engagement in treatment by around the age of 2 is associated with increases in social orienting, adaptive behavior, functional communication, language ability, and overall IQ (Brian et al., 2016; Dawson et al., 2010). Taken together, the earlier a diagnosis can be made, the sooner interventions can improve overall outcomes (Mandell et al., 2005).

Barriers to Early Identification of ASD

A number of factors appear to influence the delay in identification and thus subsequent diagnosis and intervention for children with ASD. Currently, many individuals rely on pediatricians to screen and identify young children with developmental disabilities, including ASD (Branson et al., 2008; Mandell et al., 2005). However, many pediatricians spend little time with patients, adopt a "wait and see" approach, feel uncomfortable making a definitive diagnosis without specialist consultation, lack training on early symptoms of ASD, and have limited knowledge of the presentation, prognosis and treatment (Boyd et al., 2010; Coury, 2015; Finke et al. 2010; Sand et al., 2005 as cited in Branson et al., 2008; Shah, 2001). Additionally, pediatricians do not screen for ASD specifically and are often unable to follow child developmental

screening guidelines from the American Academy of Pediatrics (AAP) due to lack of time and resources, lack of familiarity with measures, and failure to follow-up after a positive screening outcome (Coury, 2015; Dosreis et al., 2006; King et al., 2010 as cited in Adelman & Kubiszyn, 2017; Sand et al., 2005 as cited in Branson et al., 2008). These identified barriers result in an elongated period of time before families and children are referred to specialists for further assessment and early intervention (Mandell et al., 2005). Based on these obstacles, relying on pediatricians alone is not an effective method of identification and could result in adverse consequences such as individuals with ASD being missed (Branson et al., 2008; Pierce et al., 2017). As a result, we need to turn to additional sources, such as early childcare centers and preschools, to assist in the early identification of children with ASD.

Preschool Teachers' Role in Early Identification

Teachers can play a significant role in terms of problem recognition and identification of children with mental health problems (Loades & Mastroyannopoulou, 2010). While licensed professionals (e.g., psychologists, developmental pediatricians) are most often involved in diagnosing ASD, teachers should be involved in early screening and identification (Boyd et al., 2010). After all, preschool teachers are in a prime position to observe symptoms of ASD (Rosenbaum & Gabrielsen, 2019) and, given the nature of their work, they have a basis of normative comparison. In contrast to pediatricians, preschool teachers have the opportunity to observe young children repeatedly over extended periods of time in social contexts with peers (Larsen et al., 2018). This is critical given that social deficits are a hallmark feature of ASD. Since preschool teachers play a vital role by interacting with children in their early years of life, their ability to

detect children who meet criteria for the disorder can be beneficial in the long term (Arif et al., 2013) and their capacity to subsequently recommend parents for referrals is instrumental (Liu et al., 2016; Loades & Mastroyannopoulos, 2010).

ASD Knowledge Among Non-Preschool Teachers

Given that extant literature on preschool teachers in the United States is sparse, research on teachers' knowledge of ASD in other countries was also used to help inform the present study. Studies examining teacher populations, serving varying age levels, found that across countries including Turkey, Oman, Pakistan, and Saudi Arabia, most teachers lacked overall knowledge of ASD and commonly held misconceptions about the disorder (Alharbi et al., 2019; Arif et al., 2013; Ayub et al., 2017; Haimour & Obaidat, 2013; Rakap et al., 2018; Al-Sharbati et al., 2015). In some studies, there were significant differences in teachers' knowledge of ASD depending on certain variables. For example, teachers with a higher education level and previous exposure to students with ASD had significantly more knowledge (Alharbi et al., 2019; Haimour & Obaidat, 2013). Additionally, studies in the U.S., Pakistan, and Saudi Arabia found that special education teachers have a significantly higher level of knowledge of ASD compared to general education or "mainstream" teachers (Farooq et al., 2018; Haimour & Obaidat, 2013; Segall & Campbell, 2012). These findings were also replicated in a pre-service teacher population in Spain (Sanz-Cervera et al., 2017). Studies in Greece and Pakistan, found that teachers with previous work experience with students with ASD had greater knowledge (Ayub et al., 2017; Syriopoulou-Delli et al., 2012). Lastly, in the U.S., having more training in ASD was positively associated with knowledge about the disorder across

school personnel which included teachers among other professionals (Corona et al., 2017).

Current Preschool Teacher Knowledge of ASD

ASD knowledge among preschool teachers refers to general information on ASD along with its symptoms, treatment and etiology (Taresh et al., 2020a). Currently, there is a general lack of ASD awareness among early childhood teachers overall and there is limited evidence that teachers, specifically in early childhood settings, possess sufficient knowledge of ASD (Arif et al., 2013; Liu et al., 2016; Taresh et al., 2019). Additionally, much of the existing research has examined ASD knowledge of primary and secondary school teachers along with school psychologists (Liu et al., 2016). This is problematic because preschool teachers are in a unique position, as they work with the age group in which identification and diagnosis is most likely to lead to beneficial outcomes through early intervention (Liu et al., 2016).

A number of studies related to preschool teachers' knowledge of ASD were conducted internationally and generally reflect a lack of ASD knowledge among this population (Lian et al., 2008; Liu et al., 2016; Taresh et al., 2019; Taresh et al., 2020b). A study conducted in Singapore found that preschool teachers had minimal knowledge of autism, including primary diagnostic characteristics, and that education level, previous work experience with students with "special needs," and formal training in early childhood education were significant factors related to ASD knowledge scores (Lian et al., 2008). In China, researchers also found that knowledge of ASD is lacking among preschool teachers, with 83% of participants providing inaccurate responses to more than half of the items assessing knowledge of ASD, highlighting the need for greater teacher

training and instruction (Liu et al., 2016). Additionally, knowledge of ASD was associated with higher education level and school type (Liu et al., 2016). Similarly, a study conducted in Yemen found that preschool teachers tended to have a low level of ASD knowledge and that misconceptions about the disorder (e.g. maltreatment of the child by his or her parents can cause ASD) were common (Taresh et al., 2019).

Consistent with findings in Liu et al. (2016), preschool teachers who had a higher level of education had significantly more knowledge about ASD (Taresh et al., 2019). In Yemen, Taresh et al. (2020b) examined preschool teachers' ability to accurately identify preschool-age children with ASD based on videos. While preschool teachers had a moderate ability to detect general behavior problems, they did not have the skills to identify children with ASD and some mistakenly identified symptoms of ADHD as being ASD (Taresh et al., 2020b). Notably, while international literature can assist in informing the current study, it is important to note that there are cross-cultural differences that can influence the perception, severity, and conceptualization of ASD symptoms (Matson et al., 2017) that may differ from those in the United States.

As mentioned above, studies conducted in the United States on preschool teachers' knowledge of ASD are sparse and generally reflect mixed results. A study examining early educators in the U.S. found that they had basic knowledge of observable behaviors relating to autism but had limited general knowledge of autism such as age of diagnosis, gender, and neurological underpinnings (Grattan, 2017). Additionally, an unpublished dissertation, which examined preschool teachers' identification of ASD found that they had a moderate level of knowledge of ASD symptoms regardless of years of experience and that teachers reported a high level of comfort discussing concerns with

parents (Drusch, 2015). There were several methodological limitations identified in each of these studies; for example, authors used measures with Likert scales which assess opinions and beliefs rather than objectively measuring knowledge of facts (Blumenthal, 2019; DeVellis, 2003). Additionally, studies examining early childhood pre-service educators in the U.S., found that participants had limited knowledge of the general signs of ASD (Barned et al., 2011; Johnson et al., 2012). One study in particular found that 93% of preservice teachers did not know that ASD was a developmental disorder and 60% believed that children could “outgrow” it (Barned et al., 2011).

Teacher Challenges to Early Identification of ASD

This overall lack of ASD knowledge is not surprising given the absence of required coursework on the developmental and educational needs of children in teacher training programs, including early childhood programs (Barned et al., 2011; Ray et al., 2006). Specifically, training in ASD and evidence-based practices is significantly low even among special education teachers (Hart & More, 2013; McGregor & Campbell, 2001). There is an array of credentialing requirements that teachers in early childhood classrooms can obtain, ranging from a high-school education to a completion of a four-year degree or graduate training (Barned et al. 2011), and teachers with more advanced training still have misconceptions about ASD (Barned et al., 2011; Sanz-Cervera et al., 2017).

In addition to preschool teachers, studies on primary school teachers suggest they receive limited training in identifying students with emotional and behavioral challenges and that they feel inadequately prepared to differentiate typical from concerning behaviors (Askill-Williams & Lawson, 2013). Taken together, teachers could benefit

from further training to more timely detect children's mental health problems to minimize the need for future interventions (Loades & Mastroyannaopoulou, 2010). It is critical that early childhood professionals in particular, working in a range of settings including schools, are trained to accurately identify children who may need to be further referred for ASD evaluations (Mozolic-Staunton et al., 2020).

In addition to lack of knowledge, it is important to acknowledge other perceived barriers when identifying and referring children with ASD for further assessment (Kingsley et al., 2012; Taresh et al., 2020b). For example, teachers have shown variability in their comfort and confidence regarding their role in problem identification and referral (Taresh et al., 2020b). Furthermore, it is often challenging to find a tactful way to approach a parent regarding concerns about their child's development and some parents may not be ready to hear that their child's development differs from others (Branson et al., 2008). Additionally, differential diagnosis of young children can be sometimes difficult, as neurotypical children may share characteristics of ASD (Branson et al., 2008; Lord & Luyster, 2005).

As such, childcare providers, including preschool teachers, must be mindful about raising concerns about ASD given the risk of misdiagnosis or inappropriate labeling (Branson et al., 2008). When examining factors that influence preschool teachers' referral decisions for children with behavior problems, many individuals expressed reluctance to assign a stigmatizing label, concern about talking to parents, awareness that labeling a child with ASD could have negative social repercussions, and fear of parents' reactions to their assessment of their child's behavior (Branson et al., 2008; Kingsley, 2012; Taresh et al., 2020a). Additionally, teachers may find it easier to discuss less stigmatizing

problems, such as a speech or language delay, than a potential mental health disorder (Fantuzzo et al., 1999; Taresh et al., 2020a).

Knowledge and Symptom Identification

Teachers' knowledge of autism has the potential to play a critical role in the referral, diagnosis, and intervention for children with ASD. However, the extant research examining the relationship between teachers' knowledge and accuracy of symptom identification is sparse, specifically within the area of ASD. Taresh et al., (2020a) proposed a conceptual framework, not yet supported by research, to assist in identifying children with ASD and, accordingly, preschool teachers' knowledge of ASD is considered the most important factor to help them identify early signs of ASD. When examining the effects of an educational knowledge module on primary school teachers' ability to identify symptoms of childhood psychiatric disorders (ADHD, ASD, conduct disorders, scholastic skills disorders, and speech/language disorders), results indicated that, after participating in the educational module, teachers' knowledge scores significantly improved along with their ability to accurately identify childhood psychiatric disorders in case vignettes (Daniel et al., 2013). This suggests that having knowledge regarding childhood psychiatric disorders can help in early identification of symptoms (Daniel et al., 2013). In line with these findings, an unpublished dissertation by Davis (2018), found that elementary teachers' knowledge of emotional and behavioral disorders (EBDs) were significant predictors for accurately identifying students with internalizing and externalizing symptoms at risk for EBDs according to case vignettes. However, knowledge of EBDs did not predict teacher referrals and while teachers with

higher actual knowledge of EBDs were able to identify students with symptoms, they still did not refer the student for services (Davis, 2018).

Present Study

Preschool teachers are in a unique position to help close the gap between symptom identification, diagnosis, and intervention for children with ASD, given that they work with the age group in which identification and diagnosis is most relevant (Arif et al., 2013; Liu et al., 2016). However, most of the extant literature examining knowledge of ASD focuses on primary and secondary school teachers or school psychologists (Liu et al., 2016). Although there are a handful of studies that examine preschool teachers' knowledge of ASD, the majority of these studies utilize international populations and/or have methodological limitations. Additionally, while there is some existing literature on preschool teachers' knowledge of ASD (Lian et al., 2008, Liu et al., 2016), no study has examined whether knowledge of ASD predicts accuracy of ASD symptom identification in a preschool teacher population. Lastly, little is known about whether preschool teachers, even if they were able to identify symptoms of ASD, would raise concerns to caregivers' attention. As such, the current study aims to examine factors that may predict preschool teachers' knowledge of ASD, whether having knowledge of ASD relates to preschool teachers' ability to correctly identify ASD symptoms, and lastly, if ASD knowledge is associated with whether preschool teachers bring identified concerns to caregiver attention.

Research Questions

The present study examined the following research questions:

1. What demographic factors (e.g., special education experience, education level, prior ASD-focused training, previous exposure working with students with ASD) will be associated with preschool teachers' knowledge of ASD?
2. Is preschool teachers' level of knowledge positively associated with ability to accurately identify symptoms of ASD according to case vignettes?
3. Does ASD knowledge mediate the relationship between key demographic variables (i.e., education level, special education experience, prior training in ASD or previous exposure to working with students with ASD) and accuracy of ASD symptom identification across a sample of preschool teachers?
4. Is preschool teachers' knowledge of ASD associated with their likelihood of informing parents of identified concerns?
5. What reasons do preschool teachers most commonly identify for not informing parents of identified concerns?

Hypotheses

1. I hypothesized that preschool teachers' level of education, special education experience, prior training in ASD, and previous exposure to students with ASD, would be associated with their knowledge of ASD. I hypothesized this because previous studies with international preschool teacher populations, pre-service teacher populations, and primary/secondary teacher populations have indicated that teachers who have higher levels of education, who are special education teachers, who have more training in children with special needs, or who have had previous experience working with children with ASD have more knowledge of ASD (Alharbi et al., 2019; Farooq et al., 2018; Haimour & Obidat, 2013; Lian et al., 2008; Liu et al., 2016;

Sanz-Cervera et al., 2017; Segall & Campbell, 2012; Taresh et al., 2019).

Additionally, international studies examining teacher knowledge of ADHD found that teachers' prior ADHD training was positively related to overall ADHD knowledge (Sciutto et al., 2016).

2. I hypothesized that preschool teachers' level of knowledge of ASD would be positively associated with their ability to accurately identify symptoms of ASD in case vignettes. I hypothesized this because previous research has shown that having more knowledge of childhood psychiatric disorders (including ASD) is related to higher accuracy of symptom identification in primary school teachers (Daniel et al., 2013).
3. I hypothesized that preschool teachers' knowledge of ASD would mediate the relationship between key demographic variables (education level, special education experience, prior training in ASD, previous exposure to students with ASD) and accurate symptom identification of ASD using case vignettes. Assuming that a relationship exists between the mediation variable (ASD knowledge) and dependent variable (symptom identification), I hypothesized knowledge of ASD would explain the link between the independent variables (e.g., education level, special education experience) and accurate symptom identification in preschool teachers. Specifically, I predicted that higher levels of education, being a special education teacher, having prior training in ASD, and/or having previous exposure working with students with ASD would be associated with greater knowledge of ASD, which would in turn be associated with increased accuracy in identifying symptoms of ASD in case vignettes. The established relationships between demographic variables and teachers' ASD

knowledge (e.g., Haimour & Obidat, 2013; Liu et al., 2016), along with previous research examining the relationship between teachers' knowledge and symptom identification (Daniel et al., 2013; Davis, 2018), provides preliminary support for the proposed model.

4. I hypothesized that preschool teachers' knowledge of ASD would not be associated with their likelihood to inform caregivers of identified symptoms based on ASD case vignettes. I hypothesize this because preschool teachers may encounter additional barriers, independent of their knowledge level, when deciding to inform caregivers that prevent them from doing so. For example, preschool teachers often have concerns about talking to parents about ASD, specifically about their reactions and about potentially assigning a stigmatizing label to their child (Kingsley, 2012; Tareh et al., 2020a).
5. The fifth research question concerning identified reasons as to why preschool teachers do not inform parents of behaviors characteristic of ASD is intended to be an exploratory analysis addressed in the discussion section.

Method

Participants

Participants included a sample of preschool teachers in the U.S. ($N = 326$) who taught students aged 2-5 years old. Both lead teachers and assistant teachers were eligible to participate in the study. Study recruitment consisted of posts on Facebook group pages for preschool teachers and emails to local preschools. Posts and emails included a short description of the study (Appendix A) and a survey link to the 20-30-minute web-based study.

Measures

Demographics Questionnaire. A brief questionnaire of 20 items was administered (Appendix C). This measure included questions regarding the participants' gender, age, race/ethnicity, current position, level of education, number of years they have been teaching, training in education, typical classroom teacher to student ratio, age group taught, type of classroom (current and previous), experience with special education, type of school, and state in which they teach. Further, participants indicated how much training they received regarding students with disabilities (e.g., ASD), what type of training (e.g., workshops/conferences), and whether they had previously worked with children with ASD.

Autism Spectrum Disorder Knowledge Scale (ASKSG; McClain et al., 2019).

Preschool teachers' knowledge of ASD was assessed using the Autism Spectrum Knowledge Scale, General Population version (ASKSG; McClain et al., 2019). The ASKSG (Appendix D) is a valid and reliable 31-item measure that assesses one's knowledge and understanding of ASD. Items on the ASKSG were specifically written to

minimize jargon and include language more appropriate for the general population, which is most applicable for a preschool teacher population given the wide range in their level of education and training (Barned et al., 2011). Cronbach's alpha on the 31 items indicated acceptable internal consistency ($\alpha = .75$) and, as items become more difficult, only participants with higher levels of ASD knowledge are likely able to respond correctly (McClain et al., 2019). The ASKSG was scored by calculating the total number of items answered correctly out of 31 (McClain et al., 2019). Responses to items were coded in a binary fashion (correct=1; incorrect=0) with "don't know" responses recoded as incorrect according to author suggestions (McClain et al., 2019). Higher ASKSG scores reflected more knowledge of ASD.

Case Vignettes. To assess preschool teachers' ability to identify children with ASD symptoms, they were presented with a total of five vignettes which described a range of preschool students' behavior (Appendix E). Three of these vignettes depicted students who display diagnostic symptoms of ASD and who subsequently would meet criteria for ASD according to the DSM-5. More specifically, the three vignettes described students who display restricted and repetitive behaviors and social communication deficits. Additionally, to be reflective of the spectrum nature of ASD, the vignettes varied in symptoms and severity. The other two vignettes depicted preschool students characterized by signs of neurotypical development and who, based on the vignette alone, would not meet criteria for ASD or another mental health disorder according to the DSM-5. Given research reflecting a gender bias against females with ASD (Whitlock et al., 2020), which could serve as a confounding variable, individuals in the vignettes were given the same gender-neutral name and referred to with gender-neutral pronouns. The

vignettes were created to include appropriate language and an appropriate reading level for individuals with at least a high school diploma, as this is most characteristic of the participant population.

The vignettes were evaluated by professionals and clinical experts who work with young children with ASD (e.g., school and clinical psychologists, board certified behavior analysts, and licensed behavior analysts). For each vignette, six professionals rated (1) whether the behaviors described in the vignette were characteristic of a student with ASD (Strongly Disagree - Strongly Agree) (2) whether the behaviors in the vignette were characteristic of a preschool-aged student (Strongly Disagree - Strongly Agree). Participants were given the option to comment with suggestions as to how they would change the vignette to be more or less characteristic of a student with ASD and more characteristic of a preschool student. For two out of the three ASD vignettes, participants all (100%) indicated they “agree” or “strongly agree” that the behaviors in the vignette are characteristic of a student with ASD. On one ASD vignette, 66.7% of participants indicated they “agree” or “strongly agree” that the behaviors are characteristic of a student with ASD whereas 33.3% of individuals reported “neutral.” Comments from these raters were taken into consideration when editing the vignettes. The majority of respondents (83.3%) reported that they “disagree” or “strongly disagree” that the behaviors in the neurotypical vignette are characteristic of a student with ASD and 16.7% reported “neutral.” Comments from this rater were taken into consideration when editing the vignettes. All individuals (100%) reported they agree that all five vignettes depict behaviors of preschool-aged students (versus older students). Taken together, participants were presented with a set of five vignettes describing preschool children exhibiting

symptoms of ASD (three vignettes varying in symptoms and severity) and neurotypical development (two vignettes; Appendix E)

Following the vignettes, preschool teacher participants were asked to rate how likely they think it is that the student is diagnosed with the following disorders: Anxiety, Attention-Deficit/Hyperactivity Disorder (ADHD), Autism Spectrum Disorder, Learning Disorder, and Oppositional Defiant Disorder. Each item included a 4-point Likert scale (“not likely, somewhat likely, likely, and very likely”) with the option for raters to indicate if they have never heard of the disorder. Higher ratings (e.g., likely and very likely) reflected higher likelihood of the student having the diagnosis. Following this, participants were asked whether they would bring the behaviors depicted in the vignette to the attention of the child’s parent/caregiver (yes/no). For participants that answered, “No,” they were given an additional question about why they wouldn’t inform a caregiver/parent. Participants were permitted to select all that apply. Based on literature review, multiple choice answers were provided with the option for participants to indicate their own answer as well. Participants’ ability to accurately identify symptoms of ASD were based on their answers to the five vignettes.

Vignettes were coded as either incorrect or correct based on participants’ answers to the 4-point Likert scale for all disorders listed. Specifically, answers were coded as accurate for ASD vignettes, if they indicated the likelihood of the preschool student having symptoms of ASD as either “likely” (3) or “very likely” (4) and no other “distractor” disorders (e.g., ADHD, anxiety) were rated as highly as ASD. For neurotypical vignettes, participants responses were coded as accurate if they indicated the likelihood of the preschool student having ASD as “somewhat likely” (2) or “not likely”

(1). From there, a total score was computed based on how many of the vignettes were answered accurately (scores ranged from 0 to 5, with 5 being the most accurate).

Procedure

Participants completed all measures through the Qualtrics online survey platform. Before completing the survey, all participants were informed of the general purpose of the study and were asked to provide informed, written consent (Appendix B). For individuals who consented to participate in the current study, they were asked to first complete the case vignettes measure, followed by the Autism Spectrum Disorder Knowledge Scale and the Demographics questionnaire. At the end of the study, each participant was given the opportunity to enter into a lottery in order to receive a \$50 gift card to amazon. At the end of the study, one participant was randomly selected and awarded the gift card.

Results

Missing Data

The survey yielded 527 responders in total who consented to participate in the study. Exclusion decisions were made based on availability of participants' responses on key variables (e.g., independent variables, mediator variable, dependent variable). A total of 201 respondents were excluded from analysis because they were missing data for more than one key variable. The final sample yielded 326 participants and, among this sample, there was less than 2% of missing data for key variables examined.

Participant Demographics

Table 1 provides details on the demographic and professional characteristics of the sample. Most respondents were female (99.1%), Caucasian (94.5%), and non-Hispanic (90.8%) with an average age of 41.51 years ($SD=12.35$). Over three-fourths of respondents had a Bachelor's or Master's degree, half reported 10 years or more of teaching experience, and 50.6% had experience teaching in a special education classroom. Roughly one-fourth (23.4%) reported no prior training or professional development focused on children with ASD, whereas 27.1% reported 10 hours or more of ASD-focused training. Most teachers (63.6%) indicated their ASD-focused training was via workshops, conferences, or in-services. Nearly all (89.5%) reported having worked with at least one child with ASD, 32.1% with 1-3 children and 29.0% having worked with 4-9 youth. Table 1 provides further details on sample characteristics.

Independent, Dependent, and Mediating Variables

The four independent variables were teachers' level of education, previous exposure working with students with ASD, prior ASD-focused training, and special

education experience. Level of education was based on teachers' self-reported highest educational attainment ranging from "some high school" (1) to "Master's Degree and post-Master's classes" (7). Previous exposure working with students with ASD was based on the number of children with ASD with whom participants had worked with, ranging from "none" (1) to "15+ children." Prior ASD-focused training was based on the number of hours of training and/or professional development participants received ranging from "0 hours" (1) to "10+ hours" (5). A fourth independent variable was created based on whether teachers had any experience working in special education, inclusion/integrated classrooms, or ABA-based or ASD-specialty classrooms (1 = yes) or had only worked in general education classrooms (0 = no). Specifically, individuals who had indicated current or prior experience working in any special education-type classroom were coded as having special education experience whereas those who only indicated general education experience were coded as general educators. The dependent variable was accurate symptom identification based on preschool teachers' responses to the five case vignettes (possible scores range from 0-5). Additional information surrounding scoring and coding for this variable can be found in the measures section. Lastly, the hypothesized mediator variable, ASD knowledge, was respondents' ASKSG total score (possible scores range from 0-31). Participants' responses on the ASKSG were scored according to author suggestions (McClain et al., 2019).

Statistical Procedures

Data were entered and analyzed using SPSS. Descriptive statistics included calculating percentages for categorical variables and means and standard deviations for continuous variables. Between-group differences were examined using ANOVAs for

comparisons between dichotomous and continuous variables. Associations between continuous variables were examined using Spearman correlations given the ordinal nature of the variables. Significance for all analyses was set as $p < .05$, two-tailed. Using the Model 4 from the PROCESS macro for SPSS (Hayes, 2017), a series of mediation analyses were tested to examine the effect of ASD knowledge on the relationship between demographic variables (independent) and accuracy of symptom identification (dependent variable). Before analyses were conducted, the data were assessed for skew, outliers, and kurtosis and examined to test assumptions for analyses (e.g., the normality assumption). Skewness generally within the -1.0 to 1.0 and Kurtosis within -2.0 to 2.0 were used as acceptable values to help determine variables' normality assumptions. As can be seen in Table 2, skew and kurtosis were within reasonable limits. All mediation analyses were conducted using bootstrapping, which is a robust nonparametric procedure that involved taking 10,000 random samples, with replacement, from the existing data. According to this method, indirect effects were generated from each random sample and these values were then used to construct upper and lower confidence intervals. Unstandardized indirect effects were computed for the 10,000 bootstrapped samples and 95% confidence intervals (CIs) were computed by determining the indirect effects at the 2.5th and 97.5th percentiles. When the confidence interval of the indirect effect does not contain zero, the effect of the mediation is thought to be statistically significant. Compared to other tests of mediation (e.g., the Sobel's test), this bootstrapping approach provides for greater statistical power in smaller sample sizes, accounts for non-normal distribution of scores, and provides estimates of indirect effects in addition to mediation (Hayes, 2017). Furthermore, an advantage to the Hayes approach to mediation is that the

total effect does not have to be significant in order to test the mediation model which is contrary to other approaches (Hayes, 2017).

Descriptive Statistics

Descriptive statistics for the ASD Knowledge (i.e., total ASKSG score) and symptom identification (i.e., total correct on case vignettes) are provided in Table 2. The mean ASKSG score was 20.04 ($SD = 3.94$) with a range from 8.00 – 29.00. The average symptom identification score was 3.21 ($SD = 1.12$) with a range from 0.00 – 5.00.

Hypothesis 1

A series of Spearman correlations were used to examine associations between knowledge of ASD and preschool teachers' level of education, prior ASD-focused training, and previous exposure working with students with ASD. Results supported this hypothesis, as education level ($r(326)=.221, p<.001, r^2= 4.9$), prior ASD training ($r(326)=.319, p<.001, r^2= 10.1$), and previous exposure working with children with ASD ($r(326)=.414, p<.001, r^2= 17.1$), were significantly positively correlated with ASKSG score (p 's $< .001$) (Table 3). While significant, these effect sizes were in the small range. Additionally, an ANOVA examined whether experience with special education (yes/no) was associated with differences in ASD knowledge. Moreover, teachers with any special education experience scored significantly higher on the ASKSG ($M = 21.0, SD = 3.86$) than teachers with only general education classroom experience ($M = 19.1, SD = 3.82$), $F(1,324) = 19.78, p < .001, \eta^2=0.058$, with a medium effect size (Cohen, 1988).

Hypothesis 2

Correlations were also used to examine whether preschool teachers' level of ASD knowledge was associated with their ability to accurately identify symptoms of ASD in

case vignettes (Table 3). This hypothesis was confirmed as total score on the ASKSG was significantly correlated with the total symptom accuracy score, $r(326) = .206, p < .001, r^2 = 4.9$, with a small effect size.

Hypothesis 3

As previously mentioned, a series of mediation models were tested to examine the effect of ASD knowledge on the relationship between demographic variables (special education experience, prior ASD-focused training, previous exposure working with students with ASD, and education level) and accuracy of symptom identification on case vignettes. All the models tested included the same mediating variable (M), ASD knowledge, and the same dependent variable (Y), accuracy of symptom identification. The only variable that changed across each model was the independent variable (X) depending on the demographic variable tested in the specific model. Support for this hypothesis was found across all four mediation analyses.

The first mediation analysis examined the extent to which ASD knowledge mediates the relationship between education level and accurate symptom identification (Figure 1). Results demonstrate there was a significant indirect effect, suggesting that ASD knowledge mediates the relationship between education level and accurate identification of symptoms ($a*b = 0.0320, 95\% \text{ CI} = [0.011, 0.06]$). In this model, teacher education level significantly predicted ASD knowledge ($b = .6651, t(324) = 3.639, p = .0003$), ASD knowledge significantly predicted accurate symptom identification ($b = .0481, t(324) = 3.335, p = .0020$), and teacher education level significantly predicted accurate symptom identification ($b = .2043, t(324) = 3.980, p = .0001$). The direct effect

of teacher education level on accurate symptom identification (direct = .1723, $t(324) = 3.335$, $p = .0010$) was also significant.

A second analysis examined the extent to which ASD knowledge mediates the relationship between previous exposure working with children with ASD and accurate symptom identification (Figure 2). Results indicate a significant indirect effect, suggesting that ASD knowledge does mediate the relationship between previous exposure working with children with ASD and accurate symptom identification ($a*b = 0.0518$, 95% CI = [0.008, 0.097]). In this model, previous exposure working with students with ASD significantly predicted ASD knowledge ($b = 1.325$, $t(324) = 8.464$, $p = .0000$), ASD knowledge significantly predicted accurate symptom identification ($b = .0391$, $t(324) = 2.332$, $p = 0.26$), and previous exposure to students with ASD significantly predicted accurate identification of symptoms ($b = .1920$, $t(324) = 4.032$, $p = .004$). The direct effect on previous exposure to students with ASD and accurate symptom identification was also significant (direct = .1401, $t(324) = 2.681$, $p = .000$).

The third mediation analysis examined whether ASD knowledge mediates the relationship between ASD-focused training and accurate symptom identification (Figure 3). A significant indirect effect was found which suggests that ASD knowledge mediates the relationship between prior ASD-focused training and accurate symptom identification ($a*b = 0.0428$, 95% CI = [0.016, 0.074]). In this model, prior ASD-focused training significantly predicted ASD knowledge ($b = .8416$, $t(324) = 6.166$, $p = .000$), ASD knowledge significantly predicted accurate symptom identification ($b = .0508$, $t(324) = 3.123$, $p = .0020$), and prior ASD-focused training predicted accurate symptom identification ($b = .1161$, $t(324) = 2.873$, $p = .0043$). However, when controlling for

ASD knowledge, the direct effect of prior ASD-focused training on accurate symptom identification became insignificant (direct = .0733, $t(324) = 1.739$, $p = .0829$).

Lastly, a fourth analysis was conducted to determine the extent to which ASD knowledge mediates the relationship between special education experience and accurate symptom identification (Figure 4). In this model, special education significantly predicted ASD knowledge ($b = 1.8945$, $t(324) = 4.445$, $p = .0000$) and ASD knowledge significantly predicted accurate symptom identification ($b = .0545$, $t(324) = 3.457$, $p = .0006$). This time, however, special education experience did not significantly predict accurate symptom identification ($b = .2331$, $t(324) = 1.897$, $p = .0587$). There was also no statistically significant direct effect of special education experience on symptom identification accuracy (direct = .1298, $t(324) = 1.042$, $p = .2979$). As mentioned above, a unique advantage to the Hayes (2017) approach is that the total effect does not have to be significant in order to run the mediation analysis. As such, a significant indirect effect was observed, suggesting that ASD knowledge mediates the association between special education experience and symptom identification ($a*b = 0.1033$, 95% CI = [0.039 – 0.189]).

Hypothesis 4

Analyses revealed that nearly all teachers (96.5%) reported they would inform caregivers of symptoms described in the three case vignettes involving students with ASD symptoms. For vignettes describing neurotypical youth, responses were more evenly distributed between those who would inform caregivers and those who would not. ANOVA analyses were run to compare the mean scores on the ASKSG between preschool teachers who said they would inform parents and those who said they would

not (Table 4). Results indicated that preschool teachers who reported they would inform caregivers had significantly higher ASD knowledge scores on all vignettes depicting ASD symptoms (V1: $F(1,322)=4.0$, $p < .05$, V3: $F(1,322)=13.51$, $p < .05$, V5: $F(1,322)=4.42$, $p < .05$). For neurotypical vignettes, an average of 45.0% of teachers (186 teachers for vignette #2 and 104 teachers for vignette #5) reported they would inform caregivers of symptoms described in the two case vignettes (55.0% reported they would not). For neurotypical vignettes, preschool teachers who reported they would inform caregivers had significantly higher ASKSG scores on one of the two vignettes (V2: $F(1,322)=1.18$, $p = .277$, V5: $F(1,322)=4.42$, $p = .036$).

Supplemental Analyses

A hierarchical regression using step-wise variable entry was conducted in order to determine which of the four independent variables were most predictive of accurate symptom identification (Table 5). Results of the hierarchical regression showed that education level is the most predictive of symptom accuracy when controlling for ASKSG score ($B = .175$, $SE = .052$, $beta = .185$, $t = 3.390$, $p = < .001$, $adj. R^2 = .07$). Beyond education level, previous exposure to working with students with ASD was the second strongest predictor ($B = .109$, $SE = .053$, $beta = .124$, $t = 2.060$, $p = < .040$, $adj. R^2 = .08$). Beyond these two variables, prior ASD-training and special education teaching experience did not add any more predictive power.

Discussion

The literature generally suggests that there is an overall lack of ASD knowledge in the preschool teacher population (Arif et al., 2013; Liu et al., 2016; Taresh et al., 2019) and although some studies have identified variables that are associated with preschool teacher's ASD knowledge, studies are generally sparse and reflect mixed results. Most literature that does exist focuses on primary and secondary school teachers rather than preschool teachers and studies that do include preschool teachers are largely within international populations, specifically the Middle East. Additionally, no study has examined whether having knowledge of ASD predicts preschool teachers' accuracy of symptom identification or likelihood of informing caregivers of any symptoms they notice, which is important because preschool teachers are in a unique position to recognize symptoms of ASD given the amount of time they spend on a daily basis observing preschoolers interacting with one another.

On average, preschool teachers in the present study answered 65% of items correctly on the Autism Spectrum Knowledge Scale, General Population (ASKSG). Preschool teachers in this study demonstrated greater knowledge of ASD compared to international populations. Existing literature identified that the majority of preschool teachers lack ASD knowledge and provide incorrect responses on knowledge measures in countries such as China, Yemen, and Singapore (Lian et al., 2008; Liu et al., 2016; Taresh et al., 2019). For example, in China, 83% of preschool teachers provided inaccurate responses to majority of items assessing knowledge (Liu et al., 2016) whereas, in the current study, participants answered 65% of knowledge items correctly. This discrepancy between knowledge of United States preschool teachers compared to

international populations is consistent with differences also found when examining ASD knowledge in general populations. For example, individuals in the United States displayed greater knowledge of ASD compared to general populations in China and Lebanon (Obeid et al., 2015; Yu et al., 2020). It is important to note that this could be due to differences in the prevalence and/or associated stigma of ASD in the United States compared to other countries. For example, ASD is less common in China and Middle Eastern countries and there is greater stigma in these countries compared to in the United States (Obeid et al., 2015; Yu et al., 2020).

Consistent with previous research on teachers' knowledge of ASD and as predicted by the first hypothesis, preschool teachers' education, training, and experience (i.e., education level, previous exposure to students with ASD, special education experience, and prior training in ASD) were all found to be significantly associated with their knowledge of ASD (Alharbi et al., 2019; Farooq et al., 2018; Gomez-Mari et al., 2021; Haimour & Obidat, 2013; Lian et al., 2008; Liu et al., 2016; Sanz-Cervera et al., 2017; Segall & Campbell, 2012; Taresh et al., 2019). Further, teachers who had any sort of special education experience at all (either current or previous) showed significantly greater knowledge about ASD than those who taught in general education settings only. This finding makes sense given that special education teachers receive more courses focused on instructional techniques specific to students with a variety of disabilities compared to general educators (Hart & More, 2013). Individuals in the study who received more education (e.g., Master's or post-Master's classes) scored significantly higher on the knowledge of ASD measure compared to teachers who received less education (e.g., Associates Degree, some college). Teachers who worked with more

students with ASD and who obtained more training focused on ASD (through workshops, conferences, and university coursework) scored significantly higher on the ASKSG. This is not surprising given that, through more education, ASD-training, and exposure to working with children with ASD, teachers were likely exposed to diagnostic criteria, etiology, and first-hand experiences in the classroom. Taken together, the present study provides greater clarity on the relationship between these demographic variables and ASD knowledge in preschool teacher populations, specifically in the United States.

In support of the second hypothesis, ASD knowledge was significantly associated with accuracy of ASD symptom identification. As such, preschool teachers who had higher ASD knowledge scores were more likely to correctly identify vignettes that depicted students displaying symptoms of ASD among a list of distractor diagnoses (e.g., anxiety, ADHD, learning disorder) compared to teachers with lower knowledge scores. This is not surprising, considering the ASKSG assesses for knowledge of symptoms, behaviors, and identification in addition to knowledge about prevalence, intervention and outcomes (Banallie et al., 2020). This finding highlights the importance of teachers having knowledge of ASD and provides further support for the conceptual framework of Taresh et al., (2020a), who suggested that preschool teachers' knowledge of ASD is the most important factor in helping them identify early signs of the disorder. Furthermore, these results are also consistent with extant literature about the relationship between mental health knowledge and symptom identification in teacher populations more broadly (Daniel et al., 2013; Davis, 2018). Not only does the current study further support existing research that having knowledge of mental health disorders increases symptom

detection ability, but it also fills a gap within the literature specific to preschool teachers and ASD populations.

To examine the third hypothesis, a series of mediation models were tested to explore the extent to which ASD knowledge accounts for the relationship between certain demographic variables and accuracy of symptom identification. Based on study results, ASD knowledge served as a powerful mediator in all relationships between key variables (i.e., prior ASD-focused training, education level, previous exposure working with students with ASD, special education experience) and accuracy of symptom identification. Specifically, teachers with higher education, more ASD-focused training, prior special education teaching experience, and more experience working with students with ASD, had higher ASD knowledge scores which, in turn, predicted greater accuracy in ASD symptom identification. Notably, in the model examining prior-ASD training, ASD knowledge served as such a powerful mediator that once it was controlled for, the relationship between prior ASD-focused training and symptom accuracy failed to reach significance. Furthermore, special education teaching experience was not significantly associated with more accurate symptom identification, regardless of whether or not ASD knowledge was included in the model. Nonetheless, ASD knowledge remained a statistically significant mediator. Taken together, ASD knowledge is, in part, the mechanism by which demographic variables related to education, training, and experience lead to increased accuracy in symptom identification, providing support for the third hypothesis.

When surveyed about whether they would inform parents/caregivers of behaviors depicted in the vignettes, nearly all preschool teachers (96.5%) reported they would

inform for those vignettes representing students with ASD. Further, teachers with higher knowledge scores were more likely to notify caregivers of concerning symptoms that could indicate ASD than teachers with lower knowledge scores. These findings that almost all preschool teachers would bring these ASD symptoms to parents' attention was surprising, given the research suggesting that some preschool teachers "shelter" parents from difficult information (Gavish & Fleischmann, 2020). Thus, this finding does not support the fourth hypothesis that there are potential barriers, such as reluctance to assign a label, fear of stigmatization, and worry about parents' reactions (Branson et al., 2008; Kingsley, 2012; Taresh et al., 2020a), that would prevent teachers from informing caregivers of students' ASD symptoms regardless of their knowledge level. However, given that almost all teachers (96.5%) *did* indicate they would inform caregivers for vignettes depicting ASD behaviors, and even a large percentage reported they would inform for neurotypical vignettes (45.0%), this finding should be interpreted with caution. In examining this finding within broader extant literature, prior studies have found that teacher self-efficacy is positively related to knowledge of ADHD (Sciutto et al., 2000). Individuals who have higher self-efficacy are more likely to personally believe in their own competence and in their own ability to implement actions that will lead to desired results (Bandura, 1997). As such, it is possible that teachers who have greater ASD knowledge may have more self-efficacy and thus greater belief in their competency to correctly identify ASD concerns. It is also possible that those teachers with greater knowledge may be more likely to believe their act of raising concerns to caregivers' attention will result in desired outcomes (e.g., referral for an ASD evaluation or services).

The fifth hypothesis was intended to be an exploratory analysis. Given that most participants did indicate they would inform parents of behaviors reported in the vignettes, especially for those that reflected ASD symptoms, responses were very limited regarding why participants would *not* inform caregivers for the ASD vignettes. The most commonly identified reasons that participants reported was that they believed the behaviors were typical, not that worrisome, and that the child will grow out of them. These findings are not surprising considering those with significantly lower knowledge scores were less likely to report likelihood to bring concerns to caregiver attention. Those with lower knowledge are likely to be less familiar with symptom characteristics compared to typical development and the neurodevelopmental longevity of the diagnosis (APA, 2013).

Through supplemental analyses, it was found that education level is most predictive of accuracy of symptom identification followed by previous exposures to working with students with ASD. This is not entirely surprising given that individuals who have obtained higher levels of education could have been exposed to more specialized education in teaching individuals with developmental disabilities. Additionally, the predictive nature of having previous exposure to working with students with ASD, supports the importance of incorporating fieldwork experience in teacher education programs.

Strengths, Limitations, and Future Directions

These findings contribute to the limited literature on preschool teachers' knowledge of ASD in the United States and provide further clarity on the relationship between demographic variables, ASD knowledge, and accuracy of symptom

identification. The results of the mediation analyses are of particular importance as they illustrate how having ASD knowledge explains the relationship between accuracy of symptom identification and prior ASD-focused training, education level, special education experience, and previous exposure working with students with ASD. Results regarding the relationship between ASD knowledge and accurate symptom identification are also of importance given this is the first study to examine this. Results indicate that higher ASD knowledge is positively associated with greater symptom identification accuracy and increased likelihood of informing caregivers.

While this study adds to the existing literature on ASD knowledge in preschool teachers, the results should be interpreted in light of several limitations. First, the findings in the current study with regard to symptom identification were based solely on a measure of hypothetical reports of preschool teachers' responses to written vignettes of child behavior. As such, the examples in the vignettes, including those of ASD symptoms and neurotypical behavior, may not be representative of what each teacher experiences in a school day. Importantly, limitations associated with using vignettes have been widely reported (Headley & Campbell, 2011; Loades & Mastroyannopoulou, 2010). For example, while this method has been shown to have high internal validity, its ecological validity is questionable (Headley & Campbell, 2011). Preschool teachers may have provided idealistic responses; their reported symptom identification, likelihood to inform caregivers, and reasons for not bringing concerns to caregiver attention may not represent how they would actually perceive and respond to children in their classroom. Additionally, responses to hypothetical descriptions of student behavior do not allow for full consideration of the dynamic between teachers, students, and their caregivers. Future

research could utilize video vignettes as opposed to “static” or written vignettes, as videos are reportedly easier for participants to grasp and can offer valid data as they are seen to more precisely reflect “real-life” situations (Bradbury-Jones et al., 2014; Skilling & Stylianides, 2020; Torres, 2009). Given that symptoms of ASD exist on a continuum, future research should incorporate greater variation in the severity of ASD symptoms depicted in vignettes. Since pediatricians are predominantly relied upon for diagnosing developmental disabilities, it is possible that they are better able to recognize the more severe symptomatology in their limited contact (in terms of time and setting) with children compared to preschool teachers. As such, incorporating vignettes with varying symptom severity can provide greater clarity on the type and intensity of symptoms preschool teachers are able to accurately identify.

Given that almost all participants indicated they would notify caregivers of identified concerns for ASD, the validity of these results are questionable. On average, about half of the participants reported they would also inform caregivers of behaviors depicted in neurotypical vignettes (this was correlated with ASD knowledge for one vignette) which casts further doubt regarding the accuracy of these findings. Data obtained for this question and all other survey items was in the form of self-report and response bias is a widely occurring phenomenon in this type of research (Rosenman et al., 2011). There are many reasons for biased estimates of self-reported behavior ranging from misunderstanding the questions to social desirability, meaning the tendency of participants to give socially desirable responses instead of choosing responses that are actually reflective of their true thoughts and feelings (Grimm, 2010; Rosenman et al., 2011). Given the results of this study, it is possible that there was some level of response

bias and/or social desirability when participants responded to the question about whether they would inform caregivers. Furthermore, this question was posed to participants in a dichotomous format (yes/no) rather than using a Likert scale. Dichotomous approaches can lead to inadvertent responses and limit response variability compared to responses in Likert format (Greenwald & O'Connell, 1970). In the future, posing referral questions in a Likert format, with varying degrees of likelihood that teachers would inform caregivers, may increase accuracy of their reporting. Further, this may provide more useful information given the variation in answer options on a Likert scale as opposed to having to choose between two options.

Another limitation is that aspects of the current sample are not representative of the national preschool teacher population, which can limit the generalizability of study results. According to a report examining professional characteristics of the early care and education workforce, approximately 63% of preschool teachers identify as Caucasian, 17% identify as African American, 14% identify as Hispanic (Paschall et al., 2021), relative to approximately 94.5% identifying as Caucasian, 1.5% identifying as African American, 6.7% as Hispanic in the current sample, respectively. Further, approximately 35% of preschool teachers in the United States have attained a Bachelor's Degree or higher (Costa, 2019) in comparison to approximately 79% with a bachelor's degree in the current study. Thus, the sample in the present study was much more highly educated than the entire population of preschool teachers (on average) in the U.S, which might mean that many teachers do not possess as much ASD knowledge as the teachers in this study and/or identify ASD symptoms as accurately as the teachers in this study. Additionally, with regard to sampling bias, given the nature of recruitment for this study, it is possible

that the preschool teachers who are actively members of social media groups are more motivated and dedicated to their profession and therefore may be more knowledgeable of ASD. Future research should utilize a more diverse sample stratified along important demographic characteristics, specifically, education level and ethnicity. Lastly, participants were included in this study if they self-identified as a preschool teacher. However, individuals who identify as early childcare workers or daycare employees are also in a unique position to assist in early identification of ASD as they interact with young children on a regular basis. As such, future research should include participants that identify as any type of early childcare educator. This can help inform decisions about where and how to prioritize training for early childcare educators with the goal of increasing their knowledge of ASD.

A final limitation is the way that the study assessed prior experience working with children with ASD, which served as an independent variable. While participants were asked the amount of years they worked with students with ASD and the number of students they worked with who were diagnosed with ASD, respondents were not asked about the type or quality of work they did. For example, while a participant may have reported they worked with ten children with ASD, no information was obtained about how closely, in what capacity, or how long they worked with these children with ASD. Future studies should gather more information about the nature of preschool teachers' work with children with ASD, as this can provide further clarity on how this may be associated with ASD knowledge. Lastly, as depicted in the study, those with prior ASD training had more knowledge and thus greater symptom identification accuracy and likelihood to inform caregivers of concerns. As noted in Table 1, 63.6% of participants

identified they received training in the form of workshops/conferences/in-services and 33.6% noted they received training through university coursework. Future research should examine which aspects of training (e.g., coursework, outside workshops, in-services) are most effective in terms of providing preschool teachers with information on symptoms, prevalence, and identification as this can provide greater clarity as to ways in which preschool teachers can build their overall ASD knowledge.

Implications for School Psychology

The findings of this study have essential implications for the field of school psychology. Results from the current study suggest the importance of addressing preschool teachers' knowledge of ASD, as they can assist in the early identification of preschool-aged children which can prompt the initiation of intervention services. By providing teachers with more education, they have the potential to aide in closing the gap between when children can reliably be identified and when they are most often diagnosed. As mentioned above, pediatricians are primarily relied upon for the diagnosis of ASD, which has a number of limitations (Branson et al., 2008; Coury, 2015; Dosreis et al., 2006; Finke et al., 2010; Gabrielsen et al., 2015; Shah, 2001). By preschool teachers becoming knowledgeable of ASD, this has the potential to incorporate other professionals in the assessment and diagnosis of ASD. Specifically, preschools can refer families to other providers such as clinical psychologists, developmental pediatricians, neuropsychologists, and school psychologists.

As mentioned above, teacher training programs overall lack required coursework on the developmental and educational needs of children. Training and education in ASD and evidence-based practices is significantly low and extant literature suggests teachers

receive limited training in identifying emotional and behavioral challenges in the classroom (Askill-Williams & Lawson, 2013; Hart & More, 2013; McGregor & Campbell, 2001). Not only is lack of specific training associated with lack of ASD knowledge, it is also related to decreased preparedness and confidence among teacher populations (Gomez-Mari et al., 2021). Taken together, and in light of the current study's results, teachers could benefit from additional and prioritized education to more readily detect ASD concerns earlier on, which could mitigate levels of disability and improve developmental trajectories. This can be in the form of professional development, fieldwork, undergraduate or graduate school coursework, or in-service workshops led by on-site school psychologists. Additionally, with training in this area, preschool teachers are likely to feel more confident and competent working with students with ASD, ultimately enhancing their self-efficacy (Corona et al., 2017). School psychologists are in a unique position to assist in the dissemination of accurate information on the etiology, prevalence, treatment and symptoms of ASD in hopes that preschool teachers are more knowledgeable and feel more equipped to best support students in their classrooms.

Table 1
Demographic and Professional Characteristics of Sample of Preschool Teachers
(N=326)

Characteristic	N	%
Gender		
Female	323	99.1%
Male	1	0.3%
Transgender/Gender Queer	2	0.6%
Race		
White/Caucasian	308	94.5%
Black/African American	5	1.5%
Asian American	2	0.6%
American Indian/Native American	3	0.9%
Other	8	2.5%
Ethnicity		
Hispanic/Latino	22	6.7%
Non-Hispanic	296	90.8%
Missing	8	2.5%
Age (years)		
Mean (SD)	41.51 (12.35)	
Highest Level of Education		
High school diploma/GED	8	2.4%
Some college	30	9.2%
Associate's Degree	30	9.2%
Bachelor's Degree	128	39.1%
Master's Degree	95	29.1%
Post-Master's classes	35	11.0%
Current Position in Classroom		
Lead or Co-Lead Teacher	302	92.6%
Assistant Teacher	24	7.4%
Years Teaching Preschool		
0-2 years	44	13.5%
3-5 years	60	18.4%
6-9 years	58	17.8%
10-15 years	66	20.2%
16-20 years	35	10.7%
20+ years	63	19.3%
Type of School		
Private day care/Preschool	134	41.1%
Pre-Kindergarten in public school	78	23.9%
Universal Pre-K program	19	5.8%
Religious-Affiliated preschool	62	19.1%
Other	33	10.1%
Type of Classroom (current) *		

General education	240	73.4%
Special education	24	7.3%
Inclusion/Integrated	80	24.5%
ABA or ASD students only	5	1.5%
Multiple disabilities	7	2.1%
Type of Classroom (prior) *		
General education	263	80.4%
Special education	58	17.7%
Inclusion/Integrated	110	33.6%
ABA or ASD students only	24	7.4%
Multiple disabilities	20	6.1%
Any Special Education Teaching Experience **		
Yes	165	50.6%
No	161	49.4%
Prior Training/Professional Development Focused on Children with ASD		
0 hours	76	23.4%
1-2 hours	73	22.5%
3-5 hours	66	20.3%
6-9 hours	22	6.7%
10+ hours	88	27.1%
Type of ASD Training *		
Workshops/Conferences/In-Services	208	63.6%
University Coursework	110	33.6%
One-on-One Training	34	10.4%
Other	16	4.9%
# of Children with ASD Worked with in the Past		
None	34	10.5%
1-3 children	104	32.1%
4-9 children	94	29.0%
10-14 children	31	9.6%
15+ children	61	18.8%
# of Years Working with Children with ASD		
0 years	13	4.0%
1-2 years	69	21.2%
3-5 years	67	20.6%
6-9 years	44	13.5%
10-15 years	40	12.3%
16-20 years	18	5.5%
20+ years	32	9.7%
Missing	43	13.2%

* Participants able to select more than one response; percentages exceed 100%

** Respondents were categorized as having any special education experience if they had current or prior experience teaching in special education or classrooms that were integrated/inclusive, ABA-based, or devoted to students with ASD only or with multiple disabilities

Table 2
Descriptive Statistics of ASD Knowledge and Symptom Identification

	Mean (SD)	Score Range	Skew	Kurtosis
ASD Knowledge				
Total ASKSG score	20.05 (3.21)	8.00-29.00	-.357	-.020
Symptom Identification				
Total Vignette Score	3.21 (1.12)	0.00-5.00	-.085	-.706
ASKSG (Autism Spectrum Knowledge Scale, General Population)				

Table 3
Inter-Correlations Between Teacher Characteristics and ASD Knowledge

	Education Level	Prior Exposure to ASD	Past ASD Training	SpEd Experience	ASD Knowledge	Symptom Accuracy
Education Level	--	.251***	.175**	.210***	.221***	.193***
Previous exposure to ASD		--	.541***	.389***	.414***	.213***
Prior ASD Training			--	.343***	.319***	.159**
SpEd Experience				--	.230***	.110*
ASD Knowledge					--	.206***
Symptom Accuracy						--

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4
Comparisons in Mean ASKSG Score and Likelihood of Informing Caregivers Based on Case Vignettes

Vignette	Inform Parents				Statistic(df)	<i>p</i>
	Yes		No			
	N	<i>M</i> (<i>SD</i>)	N	<i>M</i> (<i>SD</i>)		
#1 (ASD symptoms)	299	20.16 (3.82)	25	18.52 (5.03)	$F(1,322)=4.01$.046
#2 (Neurotypical)	186	20.26 (3.91)	137	19.77 (4.02)	$F(1,321)=1.18$.277
#3 (ASD symptoms)	318	20.15 (3.87)	7	14.71 (4.23)	$F(1,322)=13.5$ 1	<.00 1
#4 (ASD symptoms)	32 2	20.09 (3.90)	2	12.00 (5.66)	$F(1,322)=8.52$.004
#5 (Neurotypical)	10 4	20.68 (3.99)	219	19.70 (3.90)	$F(1,322)=4.42$.036

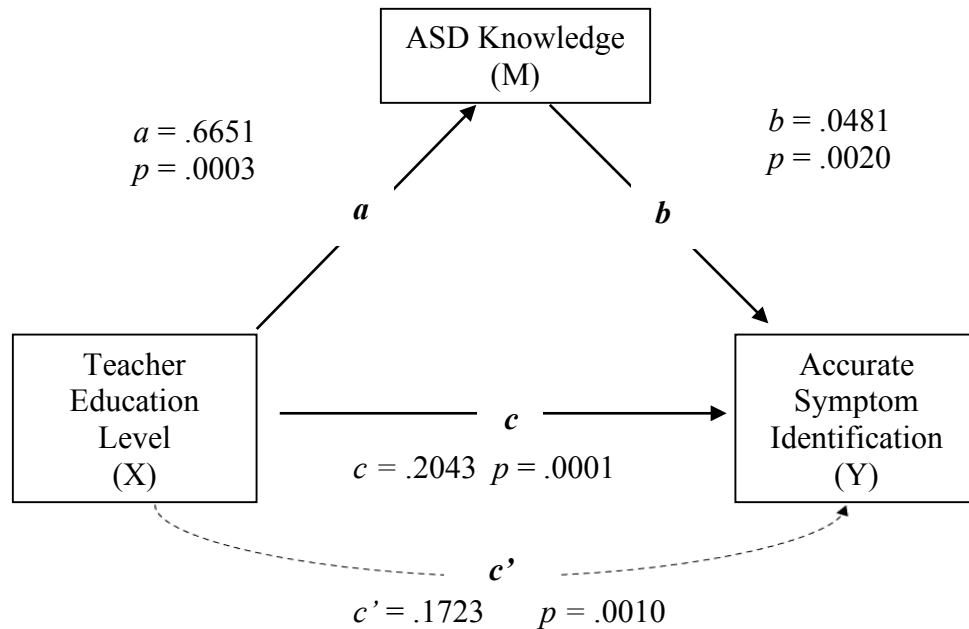
Table 5
Hierarchical Regression of Independent Variables' Prediction on Accuracy of Symptom Identification

Model		Unstandardized Coefficients		Standardized Coefficients	t	p-value
		B	Std. Error	Beta		
1	(Constant)	2.015	.315		6.396	<.001
	ASKSG	.060	.015	.213	3.906	<.001
2	(Constant)	1.317	.372		3.539	<.001
	ASKSG	.050	.015	.177	3.231	.001
	Educational level	.175	.052	.185	3.390	<.001
3	(Constant)	1.380	.372		3.714	<.001
	ASKSG	.037	.017	.129	2.185	.030
	Educational level	.154	.053	.162	2.922	.004
	Previous ASD exposure	.109	.053	.124	2.060	.040

Model 1: $R^2 = .045$, Adjusted $R^2 = .042$

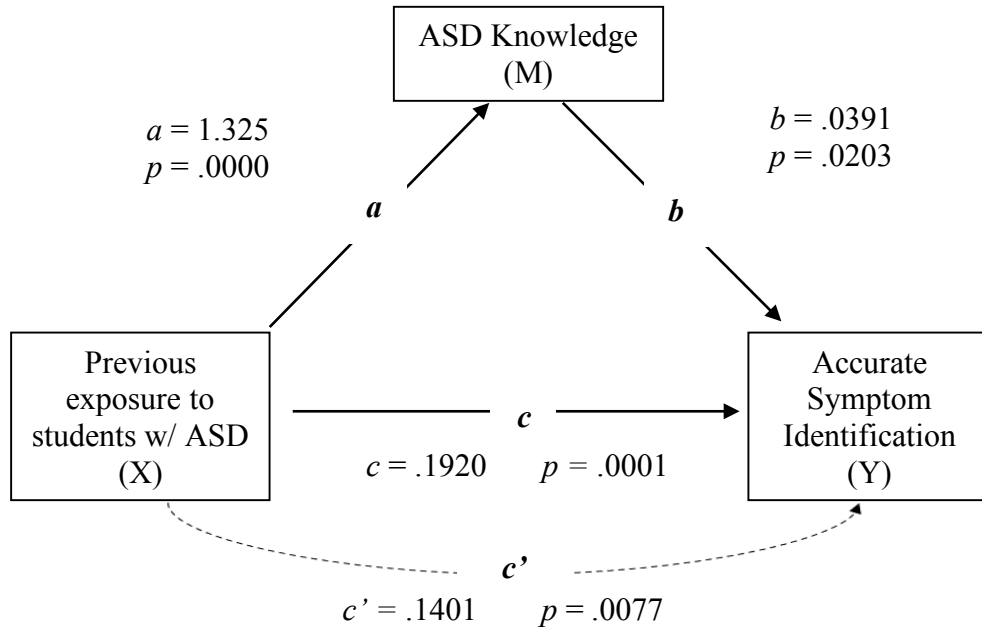
Model 2: $R^2 = .078$, Adjusted $R^2 = .073$, R^2 change = .033

Model 3: $R^2 = .091$, Adjusted $R^2 = .082$, R^2 change = .012



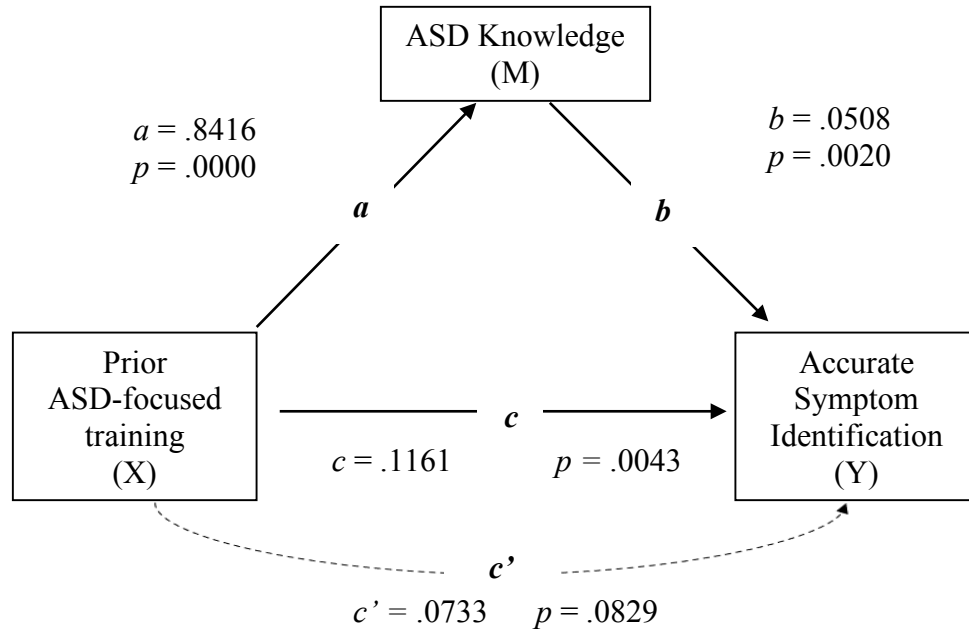
Indirect Effect of X on Y	Bootstrapped 95% CI			
	Effect	Boot SE	Lower	Upper
ASD Knowledge	.0320	.012	.011	.059

Figure 1. Teacher education level and accurate symptom identification as mediated by ASD knowledge.



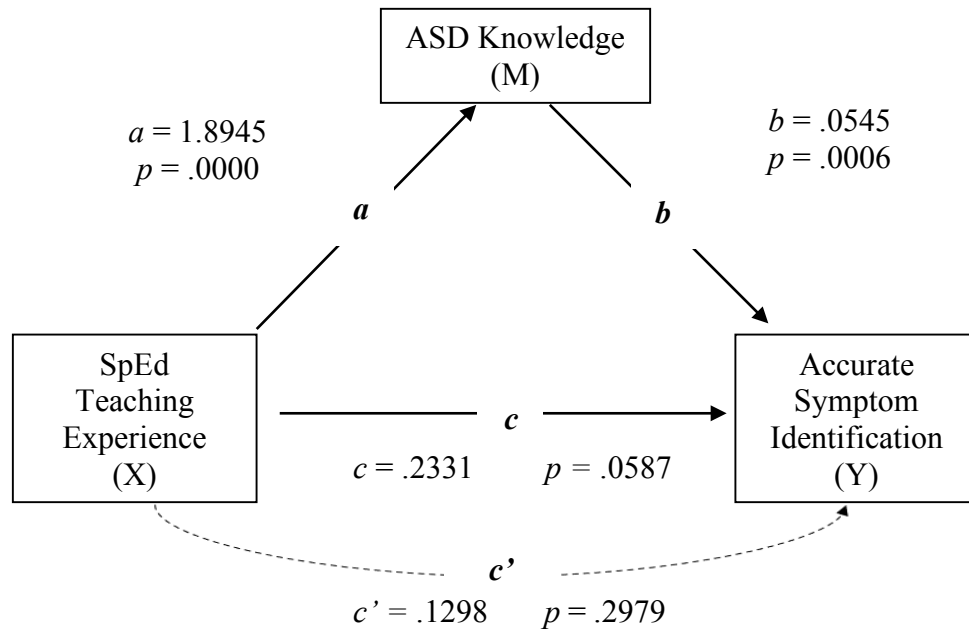
Indirect Effect of X on Y	Bootstrapped 95% CI			
	Effect	Boot SE	Lower	Upper
ASD Knowledge	.0518	.023	.008	.097

Figure 2. Previous exposure working with children with ASD and accurate symptom identification as mediated by ASD knowledge.



Indirect Effect of X on Y	Bootstrapped 95% CI			
	Effect	Boot SE	Lower	Upper
ASD Knowledge	.0428	.015	.016	.074

Figure 3. Prior ASD-focused training and accurate symptom identification as mediated by ASD knowledge.



Indirect Effect of X on Y	Bootstrapped 95% CI			
	Effect	Boot SE	Lower	Upper
ASD Knowledge	.1033	.038	.039	.189

Figure 4. Special education (SpEd) teaching experience (past or present) and accurate symptom identification as mediated by ASD knowledge.

Appendix A

Recruitment Post

Dear Preschool Teachers:

My name is Jessie Prizer and I am currently a doctoral student studying School Psychology at St. John's University. For my doctoral dissertation, I am examining how preschool teachers can assist in supporting and identifying children with mental health challenges. I would really appreciate it if you would be willing to take my survey and contribute to the research! Participants can enter to win a \$50 gift card to amazon.

Survey: https://stjohns.az1.qualtrics.com/jfe/form/SV_0ePlcdK8woMG898

Thank you very much!
Jessie

Appendix B

Consent Form



You have been invited to take part in a research study to learn more about preschool teachers' understanding of mental health disorders. This study will be conducted by Jessica Prizer, M.S. from the Department of Psychology at St. John's University as part of her doctoral dissertation and her faculty mentor is Lauren Moskowitz, Ph.D.

If you agree to be in this study, you will be asked to do the following:

1. Complete a questionnaire about your background (age, gender, education etc.).
2. Complete a questionnaire about knowledge of children's behavior
3. Read a set of vignettes describing preschooler behavior and complete a brief set of follow up questions related to your thoughts about the students' behavior.

Participation in this study will involve about 20-30 minutes of your time. At the end of the study, you will be provided with an opportunity to enter your name into a raffle drawing to receive a \$50 Amazon gift card.

Your participation in this study is voluntary. You may refuse to participate or withdraw at any time without penalty. For questionnaires or surveys, you have the right to skip or not answer any questions you prefer not to answer.

There are no known risks associated with your participation in this research beyond those of everyday life. Although you will receive no direct benefits, this research may help increase awareness surrounding preschool teachers' understanding of students with mental health problems.

Confidentiality of your research records will be strictly maintained. You will not be asked to provide any identifying information, such as your name or birthdate. However, if you wish to enter the raffle, you will be asked to provide your email address in a separate raffle survey after you complete the questionnaires. Your email address will be kept separate from your questionnaire answers (so that your e-mail address and the questionnaire data are not linked) and will only be available to study staff.

If there is anything about the study or your participation that is unclear or that you do not understand, if you have questions or wish to report a research-related problem, you may contact either Jessica Prizer at jessica.prizer17@stjohns.edu, (914) 844-3015, or her faculty mentor, Dr. Lauren Moskowitz at moskowil@stjohns.edu, (718) 990-6418.

For questions about your rights as a research participant, you may contact the University's Institutional Review Board, St. John's University, Dr. Raymond DiGiuseppe, Chair digiuser@stjohns.edu, 718-990-1955, or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu, 718-990-1440.

Agreement to Participate

Please check off below whether you agree to participate in the study.

- I have read the consent form and would like to participate in the study.
 I do not want to participate in the study.

Appendix C

Demographics Questionnaire

Are you currently a preschool teacher?

- Yes
- No

Do you teach in the United States?

- Yes
- No

What is your current gender identity?

- Male
- Female
- Transgender
- Gender queer/gender non-conforming

What is your age? _____

What is your race?

- Black/African American
- White/Caucasian
- Asian
- Middle Eastern
- American Indian/Native American
- Pacific Islander
- Other, please specify: _____

What is your ethnicity?

- Hispanic/Latino
- Not Hispanic/Latino

What is your current position in the classroom?

- Lead or Co-Lead Teacher
- Assistant Teacher

What teaching certifications do you currently hold (select all that apply)?

- None
- Child Development Associate (CDA) or equivalent certification
- Birth-2 General Education
- Birth-2 Special Education
- K-6 General Education
- K-6 Special Education
- Gifted and Talented
- English as a second language

___ Other, please specify: _____

What is the highest level of education you have completed?

- ___ Some high school
- ___ High school diploma or G.E.D. certificate
- ___ Some college
- ___ Associate's Degree
- ___ Bachelor's Degree (e.g., BA, BS)
- ___ Master's Degree (e.g., Med, MA, MS)
- ___ Master's Degree and post-Master's classes
- ___ Other: _____

How many years have you worked as a preschool teacher?

- ___ 0-2 years
- ___ 3-5 years
- ___ 6-9 years
- ___ 10-15 years
- ___ 16-20 years
- ___ 20+ years

Select the age level that you most often work with (select all that apply):

- ___ 2-3-year-olds
- ___ 3-4-year-olds
- ___ 4-5-year-olds

What is your typical Student to Teacher (to Assistant Teacher Ratio)?

- ___ 12:1:2
- ___ 8:1:1
- ___ 6:1:1
- ___ 16:1
- ___ Other: _____

How long have you worked in your current position?

- ___ 0-2 years
- ___ 3-5 years
- ___ 6-9 years
- ___ 10-15 years
- ___ 16-20 years
- ___ 20 + years

What type of school do you **currently** work in?

- ___ Private day care center/preschool
- ___ Pre-Kindergarten within a public school
- ___ Universal Pre-K Program
- ___ Religious-affiliated preschool
- ___ Other, please specify: _____

How much training and/or professional development have you received that is focused on children with disabilities and/or special education?

- 0 hours
- 1-2 hours
- 3-5 hours
- 6-9 hours
- 10+ hours

How much training and/or professional development have you received that is focused on children with autism spectrum disorder (also known as “Autism” or “ASD”)?

- 0 hours
- 1-2 hours
- 3-5 hours
- 6-9 hours
- 10 + hours

What type of training have you received focused on children with autism spectrum disorder (select all that apply)?

- Workshops/conferences/in-service
- University coursework
- One-on-one training
- Other, please specify: _____

During your time working in this field, how many children have you worked with who have autism spectrum disorder?

- None
- 1-3 children
- 4-9 children
- 10-14 children
- 15+ children

How many years have you worked in this field with children who have autism spectrum disorder?

- 0 years
- 1-2 years
- 3-5 years
- 6-9 years
- 10-15 years
- 16-20 years
- 20 + years

What type of classroom(s) do you **currently** teach in (select all that apply)?

- General education classroom

- Special education classroom
- Inclusion classroom/Integrated classroom: classroom with both general education and special education teachers and students
- Classroom with students who only have autism
- ABA classroom
- Multiple disabilities classroom
- Other: _____

What type of classroom(s) have you taught in **previously** (select all that apply)?

- General education classroom
- Special education classroom
- Inclusion classroom/Integrated classroom: classroom with both general education and special education teachers and students
- Classroom with students who only have autism
- ABA classroom
- Multiple disabilities classroom
- Other: _____

Which state do you currently teach in? _____

Appendix D

Autism Spectrum Knowledge Scale General Population (ASKSG)

Directions: Please read each statement carefully. Mark “true” if you think the statement is true, mark “false” if you think the statement is false, and mark “I don’t know” if you are unsure.

1	Less than 2% of people in the US have autism spectrum disorder.	True	I don't know	False
2	Vaccines can cause autism spectrum disorder.	True	I don't know	False
3	Boys are four times as likely than girls to have autism spectrum disorder.	True	I don't know	False
4	Children who have a brother or sister with autism spectrum disorder are more likely to develop the disorder.	True	I don't know	False
5	Autism spectrum disorder is caused by a lack of motherly warmth.	True	I don't know	False
6	Advanced paternal (father) age is a risk factor for autism spectrum disorder.	True	I don't know	False
7	There are no differences in the identification rates of autism spectrum disorders across racial and ethnic groups.	True	I don't know	False
8	All individuals with autism spectrum disorder have low intellectual quotients (i.e., IQs).	True	I don't know	False
9	Children with autism spectrum disorder may not play with toys the way they are intended.	True	I don't know	False
10	Individuals with autism spectrum disorder may have strict routines or rituals.	True	I don't know	False
11	Individuals with autism spectrum disorder have difficulties interacting socially with others.	True	I don't know	False
12	Some individuals with autism spectrum disorder may be uncoordinated or clumsy.	True	I don't know	False
13	Many individuals with autism spectrum disorder have difficulties expressing themselves.	True	I don't know	False
14	Symptoms of autism spectrum disorder do not appear before the age of two years.	True	I don't know	False
15	Diagnosis of autism spectrum disorder is primarily based on behavioral observations and parent interviews.	True	I don't know	False
16	Autism spectrum disorder can only be diagnosed after the age of four years.	True	I don't know	False
17	If a teacher believes a student has autism spectrum disorder, they can make a diagnosis.	True	I don't know	False
18	Autism Spectrum Disorder can be diagnosed with brain imaging.	True	I don't know	False

19	For a diagnosis of autism spectrum disorder, symptoms must be present from early childhood.	True	I don't know	False
20	It is possible for autism spectrum disorder to develop into adulthood.	True	I don't know	False
21	A diagnosis of autism spectrum disorder can only be made by a medical doctor.	True	I don't know	False
22	There are no beneficial treatments available for individuals with autism spectrum disorder.	True	I don't know	False
23	Restricting certain foods (e.g., gluten) is an effective treatment for autism spectrum disorder.	True	I don't know	False
24	Social skills training is an effective treatment for some individuals with autism spectrum disorder.	True	I don't know	False
25	Intellectual quotient (i.e., IQ) and age affect treatment success for children with autism spectrum disorder.	True	I don't know	False
26	Most individuals with autism spectrum disorder will never learn to speak.	True	I don't know	False
27	Symptoms of autism spectrum disorder do not change throughout an individual's life.	True	I don't know	False
28	Autism spectrum disorder only affects children.	True	I don't know	False
29	Many individuals with autism spectrum disorder have difficulties living and working independently in adulthood.	True	I don't know	False
30	Up to 70% of individuals with autism spectrum disorder also have an additional mental health diagnosis (e.g. anxiety).	True	I don't know	False
31	Many children with autism spectrum disorder are at risk for academic difficulties.	True	I don't know	False

Appendix E

Case Vignettes

Clinical Vignette #1: Alex is a preschool student. Alex enjoys playing with toy trains and happily plays alone on the rug, alongside other children. Alex often appears preoccupied by aspects of toys such as their wheels or doors. When feeling excited, Alex often jumps and moves his/her hands up and down. Alex loves the show “Daniel the Tiger” and frequently recite lines from the series while at school. Alex seems uninterested in engaging with other children and has difficulty making eye contact when interacting with others. Alex enjoys talking about the weather but usually doesn’t engage in back-and-forth conversation about other subjects. Alex is often sensitive to tags on shirts, dislikes the seams of socks, and is a picky eater.

1. How likely do you think the student described above is diagnosed with the following disorders?

Anxiety:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Attention-Deficit/Hyperactivity Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Autism Spectrum Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Learning Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Oppositional Defiant Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

2. Would you bring these behaviors to the attention of the child’s parent/caregiver?

Yes No

3. If you answered no, why wouldn't you bring these behaviors to the child's parent/caregiver's attention (select all that apply)?
- These behaviors are typical
 - These behaviors are not that severe or worrisome
 - The child will likely grow out of these behaviors
 - I don't have the training to do so
 - It is not a teacher's job
 - It wouldn't make a difference
 - I wouldn't have the support of my school team
 - I am concerned about parents' responses
 - I don't want to stigmatize the child
 - Other _____

Clinical Vignette #2: Alex is a preschool student. During free play, Alex enjoys lining up toys against the rug. Alex also has a preoccupation with firetrucks, specifically the way their ladders move up and down. Alex loves looking at the daily schedule and when the classroom has a change in routine, Alex can often become upset by crying or falling to the floor. Alex is sensitive to loud noises and covers his/her ears when the class plays music. Alex's language abilities are limited and his/her parents reported that Alex didn't speak until two years of age. Alex appears disengaged when adults and other children attempt to engage with him/her.

1. How likely do you think the student described above is diagnosed with the following disorders?

Anxiety:

Not Likely Somewhat Likely Likely Very Likely

__ I have never heard of this disorder

Attention-Deficit/Hyperactivity Disorder:

Not Likely Somewhat Likely Likely Very Likely

__ I have never heard of this disorder

Autism Spectrum Disorder:

Not Likely Somewhat Likely Likely Very Likely

__ I have never heard of this disorder

Learning Disorder:

Not Likely Somewhat Likely Likely Very Likely

__ I have never heard of this disorder

Oppositional Defiant Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

2. Would you bring these behaviors to the attention of the child's parent/caregiver?

Yes No

3. If you answered no, why wouldn't you bring these behaviors to the child's parent/caregiver's attention (select all that apply)?

- a. These behaviors are typical
- b. These behaviors are not that severe or worrisome
- c. The child will likely grow out of these behaviors
- d. I don't have the training to do so
- e. It is not a teacher's job
- f. It wouldn't make a difference
- g. I wouldn't have the support of my school team
- h. I am concerned about parents' responses
- i. I don't want to stigmatize the child
- j. Other _____

Clinical Vignette #3: Alex is a preschool student. While Alex enjoys playing with puzzles, he/she appears to lack enjoyment when engaging with peers and teachers. While Alex rarely engages in imaginative play, he/she loves to imitate vehicle sounds aloud. When it is time to clean up the toys and transition to another activity, Alex frequently tantrums which involves screaming and crying. Alex uses a limited number of single words and sometimes does not speak at all in school. When teachers or parents call his/her name, Alex does not respond. Alex frequently rocks his/her body back and forth when feeling upset or excited. Alex can become physically aggressive and often bites and hits other students.

1. How likely do you think the student described above is diagnosed with the following disorders?

Anxiety:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Attention-Deficit/Hyperactivity Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Autism Spectrum Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Learning Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Oppositional Defiant Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

2. Would you bring these behaviors to the attention of the child's parent/caregiver?

Yes No

3. If you answered no, why wouldn't you bring these behaviors to the child's parent/caregiver's attention (select all that apply)?

- a. These behaviors are typical
- b. These behaviors are not that severe or worrisome
- c. The child will likely grow out of these behaviors
- d. I don't have the training to do so
- e. It is not a teacher's job
- f. It wouldn't make a difference
- g. I wouldn't have the support of my school team
- h. I am concerned about parents' responses
- i. I don't want to stigmatize the child
- j. Other _____

Typical Development Vignette #1: Alex is a preschool student. Alex enjoys playing with building blocks and reading books. Alex's favorite activity at school is music and he/she gets very excited when they go on the playground. Alex can get easily upset when another child takes his/her toys and the teachers noticed that he/she is a picky eater. Alex can sometimes be shy around new people but is friendly and talkative with classmates especially when they have free play. Alex loves the morning meeting song and happily greets his/her mother when she arrives for afternoon pick up.

1. How likely do you think the student described above is diagnosed with the following disorders?

Anxiety:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Attention-Deficit/Hyperactivity Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Autism Spectrum Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Learning Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Oppositional Defiant Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

2. Would you bring these behaviors to the attention of the child's parent/caregiver?

Yes No

3. If you answered no, why wouldn't you bring these behaviors to the child's parent/caregiver's attention (select all that apply)?

- a. These behaviors are typical
- b. These behaviors are not that severe or worrisome
- c. The child will likely grow out of these behaviors
- d. I don't have the training to do so
- e. It is not a teacher's job
- f. It wouldn't make a difference
- g. I wouldn't have the support of my school team
- h. I am concerned about parents' responses
- i. I don't want to stigmatize the child
- j. Other _____

Typical Development Vignette #2: Alex is a preschool student. Alex enjoys playing with the toy kitchen and engaging in imaginative dress-up play. Alex loves being the line leader and prefers to sit on teachers' laps during circle time. Sometimes, Alex has difficulty separating from his/her father in the morning. Alex likes dressing him/herself in the mornings and frequently prefers to wear the same yellow shirt. When prompted to change clothing, Alex often tantrums. Alex enjoys art projects yet can easily become fussy if paint gets on his/her hands. While on the playground, Alex spends his/her time going down the slide and playing with classmates.

1. How likely do you think the student described above is diagnosed with the following disorders?

Anxiety:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Attention-Deficit/Hyperactivity Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Autism Spectrum Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Learning Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

Oppositional Defiant Disorder:

Not Likely Somewhat Likely Likely Very Likely

I have never heard of this disorder

2. Would you bring these behaviors to the attention of the child's parent/caregiver?

Yes No

3. If you answered no, why wouldn't you bring these behaviors to the child's parent/caregivers' attention (select all that apply)?

- a. These behaviors are typical
- b. These behaviors are not that severe or worrisome
- c. The child will likely grow out of these behaviors
- d. I don't have the training to do so
- e. It is not a teacher's job
- f. It wouldn't make a difference
- g. I wouldn't have the support of my school team
- h. I am concerned about parents' responses
- i. I don't want to stigmatize the child
- j. Other _____
- k.

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