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Longitudinal Associations Between Internalizing Behaviors and Social Skills for Autistic Students During the Early School Years

Brittany A. Pereira[1], Narmene Hamsho[2], Annisha Susilo[1], Gianna M. Famolare[1], Jan Blacher[3], and Abbey Eisenhower[4]

[1] Department of Counseling and School Psychology, University of Massachusetts Boston
[2] School of Psychology and Counseling, Fairleigh Dickinson University
[3] Graduate School of Education, University of California Riverside
[4] Department of Psychology, University of Massachusetts Boston

Autistic students experience greater social difficulties and heightened internalizing behaviors (e.g., anxiety, depression, withdrawal) relative to their nonautistic peers, yet little is known about how these domains influence one another over time. This 1.5-year longitudinal study analyzed the associations between teacher-reported social skills and internalizing behaviors across three time points for 177 autistic students aged 4–7 years. Cross-lagged panel analyses indicated an association between earlier internalizing behaviors and later social skills for autistic students, whereby lower internalizing behaviors predicted greater growth in social skills from one school year to the next. These changes in social skills followed children across multiple teachers and classroom contexts. The opposite cross-lagged path was not supported as early social skills did not predict changes in internalizing behaviors over time. Internalizing behaviors showed similar associations with later social skills for autistic students regardless of cognitive ability, for those in general and special education classrooms, and for those whose teachers did and did not have autism-specific training. Findings suggest that promoting students' early emotional well-being and targeting internalizing behaviors may indirectly enable social development over time.

Impact and Implications

This study examined developmental cascades of young autistic students' social skills and internalizing behaviors (e.g., anxiety, depression, withdrawal) across the early school years. Those with higher internalizing behaviors early in elementary school showed attenuated growth in social skills over 1.5 years relative to children who had fewer early internalizing behaviors. These findings can aid school psychologists efforts to intentionally support young autistic students social–emotional transition to formal schooling.

Keywords: autism, social–emotional, longitudinal

The transition to formal schooling marks a pivotal developmental shift for young children in the United States as they acclimate to meet the novel demands of the early school environment (Vitiello et al., 2020). This transition can be particularly difficult for neurodivergent students entering school who often encounter neurotypical behavior expectations, ableist communication demands, or classroom environments that are setup for nonautistic learners (Spaeth & Pearson, 2021). In turn, autistic students[1] may have difficulty with social communication and interactions in these contexts, leaving them especially vulnerable to social and emotional challenges during and beyond this transition period (Marsh et al., 2017).

In nonautistic samples, there is evidence that social and emotional difficulties may contribute to one another over time (Bichay-Awadalla et al., 2020; Bornstein et al., 2010; Ladd & Troop-Gordon, 2003). These developmental cascades, however, have yet to be explored among young autistic students during the sensitive transition to formal schooling. As such, we analyzed data from a larger 1.5-year study examining the early adjustment of autistic students from the perspective of teachers to investigate whether bidirectional associations between social skills and internalizing behaviors were observed during the early school years. School psychologists, positioned to coordinate social–emotional screening and intervention efforts within a multitiered system of support, may find this work useful when considering priority areas that warrant

Brittany A. Pereira https://orcid.org/0000-0001-5842-3565

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Correspondence concerning this article should be addressed to Brittany A. Pereira, Department of Counseling and School Psychology, University of Massachusetts Boston, 100 William T. Morrissey Boulevard, Boston, MA 02125-3393, United States. Email: brittany.pereira001@umb.edu

[1] Identity-first language (i.e., "autistic person") or "person on the autism spectrum" is used in place of person-first language (i.e., "person with autism spectrum disorder") to reflect emerging perspectives and preferences from the autistic community (e.g., Botha et al., 2023; Bottema-Beutel et al., 2021).

attention at a universal and secondary level to meet the heightened social–emotional needs of autistic students during the transition to formal schooling.

Internalizing Behaviors and Autism

During the early school years, autistic students begin to show heightened internalizing behaviors compared to their nonautistic peers (Salazar et al., 2015), which have been attributed to greater social difficulties for this population later in life (Bauminger et al., 2010). Internalizing behaviors (i.e., anxiety, depression, and social withdrawal) are more prevalent for autistic students than nonautistic students (Bauminger et al., 2010; Guttmann-Steinmetz et al., 2010). Compared to 8% of nonautistic youth, 69% of autistic youth aged 9–13 years met the criteria for clinically significant anxiety (Kerns et al., 2021), with anxiety disorders being the most common cooccurring disorder for autistic youth (Simonoff et al., 2008). Internalizing behaviors can be challenging to detect in autistic youth given symptom overlap between autism spectrum disorder, anxiety, and depression alongside limitations in self-reporting abilities when communication and intellectual impairments are present (Pandolfi et al., 2014). Despite these measurement challenges, heightened rates of internalizing behaviors are consistently observed and reported for young autistic youth across parent, teacher, and self-report ratings (Bauminger et al., 2010; Gadow et al., 2012; Guttmann-Steinmetz et al., 2010; Kerns et al., 2021).

Research has documented the many ways school environments can contribute to internalizing behaviors for autistic students. Autistic adolescents and adults report that isolation in school, and resulting anxiety, are intensified by autism stigma from teachers and peers (Berkovits et al., 2020; Mueller, 2021) and a lack of connection to a disability community (Mueller, 2021). Prolonged separations from caregivers over the school day (Salazar et al., 2015) and high levels of sensory stimuli in schools are also salient sources of anxiety for some young autistic students (Williams et al., 2019). Some researchers have even considered the extent to which autism characteristics (i.e., a preference for sameness or routine, the use of repetitive behaviors) may be mechanisms for managing the anxiety that comes from navigating inhospitable environments (e.g., Gillott et al., 2001; Kapp et al., 2019).

The early emergence of internalizing behaviors may interfere with children's ability to establish and maintain social relationships in which to exercise their social skills (Bornstein et al., 2010). When children continuously experience negative emotional outcomes in social situations, this can worsen already present internalizing behaviors that perpetuate a cycle of social withdrawal and prevent future attempts to socialize with others (Fine et al., 2003). Some evidence suggests that children with greater social awareness of their social difficulties may experience heightened distress as a result and therefore experience greater internalizing behaviors (Troop-Gordon & Ladd, 2005). Consistent with this hypothesis, social difficulties may take a particular toll on the emotional well-being for autistic children without a cooccurring intellectual disability (ID; Salazar et al., 2015), underscoring the importance of accounting for cognitive ability when examining social–emotional functioning (Baker & Blacher, 2020; Mayes et al., 2022).

Critically Evaluating the Construct of Social Skills

Importantly, assessing social domains among autistic children is inherently challenging and multilayered, given the legacy in the research, education, and mental health fields of upholding neurotypical social behaviors as "skills" to strive for, attempting to replace autistic characteristics in the name of social skill development, and generally implementing interventions aimed at getting autistic children to act or appear less autistic in their social interactions (Bottema-Beutel et al., 2018). We reject these goals while simultaneously holding on to the dialectic, articulated by autistic advocates, that social adjustment, social competence, and relationships are desired goals.

At the time of this writing, many commonly used instruments available to assess children's social and emotional development rely on an intraindividual deficit focus that, if misused, can divert intervention efforts from improving the conditions that perpetuate student challenges (Dineen et al., 2022). The Social Skills Improvement System (SSIS; Gresham & Elliott, 2008), selected for the purpose of this study given its ability to discriminate between samples of children affected by different psychological conditions and scales that mirror desired goals articulated by autistic individuals (i.e., communication, assertion, responsibility, empathy, engagement), is an example of a commonly used tool that can easily reinforce intraindividual deficits. By acknowledging the potential for misuse of social–emotional screening outright, we aim to encourage school psychologists and researchers alike to consider our conceptualizations of student challenges, data usage, and means of intervening to ensure we are doing so in ways that address root causes of concern.

Social Competence and Autism

Social skills include verbal and nonverbal means of communication that facilitate effective interactions with others under the social norms of an environmental context (Grover et al., 2020). In school environments, a student's ability to perform socially expected behaviors (engaging in conversation, turn-taking, sharing, listening to, and following directions, etc.) is relevant in enabling prosocial interactions and positive relationships (Gresham & Elliott, 2008). The social expectations of nonautistic individuals, however, can be difficult for autistic students to meet.

Consistent with inclusion, federal law mandates that students receiving special education services, including autistic students, are entitled to the least restrictive classroom environments that will adequately support their learning (Individuals with Disabilities Education Improvement Act, 2004). In practice, placement decisions and opportunities for inclusion for autistic students are, in part, dictated by their social skills (Lauderdale-Littin et al., 2013), with social difficulties linked to likelihood of more restrictive classroom placements (White et al., 2007). Research finds autistic students are likely to spend most of their school time with paraprofessionals and other students with disabilities (U.S. Department of Labor, Bureau of Labor Statistics, 2019). In many cases, even in full inclusion settings, autistic students are often physically positioned on the outskirts of the classroom, limiting their opportunities to participate as an integrated social member (Giangreco, 2010). These arrangements may inhibit autistic students from socializing with peers, creating a social disconnect that leaves them susceptible to

victimization and bullying. Indeed, autistic students experience higher rates of victimization (e.g., teasing and bullying; Tipton-Fisler et al., 2018), stigmatizing messages from peers (Cohen et al., 2022), and loneliness (Zeedyk et al., 2016) than nonautistic students, which in turn have been linked to greater internalizing behaviors relative to nonautistic youth (e.g., Gadow et al., 2012). In all, differences in social skills—coupled with limited opportunities for social integration with nonautistic peers—may inhibit peer relationships that exacerbate internalizing behaviors for autistic students (Bolourian et al., 2019).

Cognitive Ability as a Moderator

There is clear evidence to suggest that social skills (e.g., interpreting or responding to social cues, engaging in conversation, nonverbal behaviors, turn-taking, and conflict resolution) may be intertwined with cognitive ability (de Bildt et al., 2005). There is, however, conflicting evidence as to whether cognitive ability moderates the impact of internalizing behaviors on social adjustment for autistic individuals. About one third (31%) of individuals diagnosed with autism are also identified as having an ID, marked by cognitive and adaptive functioning difficulties that affect abstract thinking, reasoning, academic learning, and social skills (American Psychiatric Association, 2022). Some research shows that autistic youth without ID experience higher levels of anxiety and depressive symptoms than those with ID (Gillott et al., 2001; Mazurek & Kanne, 2010; Kanne et al., 2009), whereas other research shows just the opposite, with higher levels of anxiety-related symptoms among autistic youth with ID than those without (Winch et al., 2022). Moreover, some evidence suggests that ID may not be a significant moderator of internalizing behaviors and autism-related symptoms at all (Eussen et al., 2013). This inconsistent pattern begs the question of whether early social adjustment and internalizing behaviors are influenced by cognitive ability.

Classroom Type and Teacher Training as Moderators

The pathways between children's internalizing symptoms and their social adjustment over time may be facilitated or disrupted by aspects of their school experience. Namely, their classroom placement (general education vs. special education) may impact these pathways, aligned with research showing that children's student–teacher relationships and peer relationships often differ between classroom types (Feldman et al., 2019). Likewise, teachers who have autism-specific training may be equipped to alter these pathways by supporting children's social and emotional well-being even in the context of early social or internalizing difficulties. Thus, we examine these two possible moderators in an exploratory manner.

The Present Study

Autistic students experience heightened internalizing behaviors, which may relate to or be exacerbated by their difficulties with social competence. However, there is little understanding of how social competence and internalizing behaviors may be associated with each other over time for autistic students during the early school years. Because social skills and internalizing behaviors can impact students' educational and developmental experiences, we relied on secondary data analysis to examine the association between these factors over time among young autistic students to address the following questions:

1. Are there bidirectional associations between social skills and internalizing behaviors for autistic students across 2 school years?
2. Do cognitive ability, classroom type, or teachers' autism training moderate the associations between social skills and internalizing behaviors?

Method

Participants

Participants were 177 autistic students ages 4–7 years ($M = 5$ years, 7 months, $SD = 12.0$ months), and their parents and their teachers involved in a study examining early adjustment to formal schooling. University institutional review board approval was obtained before participants were recruited across Massachusetts and Southern California through online and print advertisements, autism-related conferences, school districts, clinicians, and autism resource centers. Once consent was obtained, parents and children attended an initial eligibility session held during the Summer or Fall where trained clinicians administered the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2000) using revised research algorithms developed for the ADOS-2 (Gotham et al., 2008) and an abbreviated version of the Weschler Preschool and Primary Scale of Intelligence–Third edition (WPPSI-III; Wechsler, 2002) to children.

Eligible children were those who scored in the autism or spectrum range on the ADOS (77.8% autism range) using the revised research algorithms (Gotham et al., 2007), earned an estimated Full-Scale IQ (FSIQ) over 50 on the WPPSI-III, and were entering elementary school or their final year of preschool. In addition, if children had not already received a formal diagnosis of autism spectrum disorder (<3%), the Autism Diagnostic Interview–Revised (Rutter et al., 2003) was administered to the parent. For the present study, students with teacher-reported data from at least one of three time points were included in analyses.

At Time 1, children were in preschool (34.5%), kindergarten (31.6%), 1st grade (25.9%), or 2nd grade (8.0%). About half of children (54.6%) spent ≥50% of the day in a general education versus a special education classroom. One-quarter of teachers (25.2%) had at least some professional training in autism, including 7.0% of general education teachers and 42.1% of special education teachers. Other teacher and student demographics, which were gathered through parent- and teacher-report surveys, are reported in Table 1. The majority of students were boys (83.1%), attended public school (86.8%), and did not have cognitive delays (83.1%).

Measures

Autism Diagnosis

The ADOS (Lord et al., 2000), a semistructured observation schedule to assess autism characteristics, was administered to determine eligibility (see Table 1). Ratings were assessed using the revised research algorithms, which outperform the original algorithm in terms of accurately predicting autism cases and comparability across modules (Gotham et al., 2008).

Table 1
Participant Demographics at Time 1 (N = 177)

Child demographics	%/*M* (*SD*)
Age (in months)	67.8 (12.0), range: 48–92 months
Gender (% male)	83.1%
Race (%)	
Asian	6.2%
African American	4.0%
Latine	9.0%
Multiracial	19.8%
Other	4.5%
White	55.4%
Race not provided	1.1%
School setting (% public)	86.8%
IQ (WPPSI-III)	88.4 (18.0)
Cognitive delay	16.9%
ADOS algorithm total score	15.3 (5.1)
Teacher demographics	
Gender (% female)	76.8%
Race (%)	
Asian	5.1%
African American	2.8%
Latine	11.9%
Native American	0.6%
Other	5.6%
White	60.5%
Education (% master's degree)	58.7%
% with any professional training in autism	25.2%

Note. ADOS = Autism Diagnostic Observation Schedule; WPPSI-III = Weschler Preschool and Primary Scale of Intelligence–Third edition.

Social Skills

Teacher responses on the 46-item SSIS (Gresham & Elliott, 2008) were used to assess students' social competencies across seven dimensions (communication, cooperation, assertion, responsibility, empathy, engagement, self-control). Teachers rated the frequency of behaviors on a 4-point scale from *never* to *almost always*. We utilized the total social skills standard score ($M = 100$, $SD = 15$) where higher scores indicate higher social skills, and scores ≤79 are considered in the borderline range. This tool demonstrates adequate validity (Gresham & Elliott, 2008) and has been used with autistic students (Mandelberg et al., 2014) and students with ID (Neece & Baker, 2008). Here, we report not only α but also ω, which has been shown to outperform α especially in conditions of τ inequivalence or differing item formats (Dunn et al., 2014). For our sample, the Time 1 social skills scale showed an α of 0.95 and an ω of 0.95 (95% CI [0.93, 0.97]).

Internalizing Behaviors

Teachers completed the Caregiver–Teacher Report Form (CTRF) ages 1.5–5 years and the Teacher Report Form (TRF) ages 6–18 years (Achenbach & Rescorla, 2000, 2001), depending on child age, to assess internalizing behaviors. Items are rated on a 5-point Likert scale evaluating withdrawn behavior, somatic complaints, and anxious/depressed symptomatology. Internalizing *T* scores ($M = 50$, $SD = 10$) of 60–63 fall in the borderline range, and scores ≥64 fall in the clinical range. CTRF and TRF demonstrate good internal consistency and construct validity and have been previously used with autistic samples (e.g., Pandolfi et al., 2014). Our sample showed a Time 1 α of 0.95 and an ω of 0.95 (95% CI [0.94, 0.97]). Research finds teachers more likely to underreport the presence of internalizing behaviors compared to self-report measures as the internally focused symptoms are often difficult to detect; as such, these instruments tend to have high specificity in terms of identifying children in the nonclinical range, with mixed sensitivity in terms of identifying children with clinically significant symptomatology (Stensen et al., 2022).

Cognitive Ability

Students' cognitive abilities were assessed using an abbreviated form of the WPPSI-3 (Wechsler, 2002). A FSIQ ($M = 100$, $SD = 15$) was reported for each student as determined by scores on Matrix Reasoning, Vocabulary, and Picture Completion subtests. This abbreviated measure has demonstrated predictive validity and reliability (Sattler, 2008). Cognitive delays were indicated by an FSIQ below 70.

Procedure

This study involves secondary data analysis drawn from a larger 1.5-year project examining school adaptation among young autistic students through parent-report, teacher-report, and research office-based child assessments. Participant eligibility was assessed during office visits held in Summer or Fall using the ADOS and WPPSI-III. The ADOS and WPPSI-III were administered by trained graduate students or postbaccalaureate staff (supervised by a licensed psychologist or trained professional) or by a licensed psychologist. Assessors were research reliable on the ADOS or supervised by a research-reliable clinician; 20% of assessments were completed by two examiners to minimize the risk of drift in administration and scoring. Student demographics were obtained in the Fall (Time 1) through parent surveys. Teachers completed the SSIS and CTRF (or TRF) Time 1 (1 month into the school year), Time 2 (6 months later in Spring, same school year), and Time 3 (9 months after Time 2, during Winter, following school year). Most students (95%) had a different teacher at Time 3, meaning that 95% of teacher respondents at Time 3 were different than at Times 1 and 2.

Data Analysis

Descriptive analyses were conducted in SPSS 27; all other analyses were conducted in MPlus. To assess whether there were transactional associations between internalizing behaviors and social skills over time (research question 1), we conducted a cross-lagged panel analysis, covarying IQ, between students' teacher-perceived internalizing behaviors and social skills across three time points. Research supports the examination of grouping variables in a structural equation modeling framework, even when the groups are of substantially unequal size, if the overall sample size is adequate for structural equation modeling (Baribeau et al., 2022; Hecht & Zitzmann, 2021). Next, to examine whether significant paths were moderated by cognitive ability (research question 2), the model was *constrained* by cognitive ability (1 = FSIQ < 70, 2 = FSIQ > 70) and compared to a model fully unconstrained by cognitive ability. Where an effect of cognitive ability was observed,

individual paths were unconstrained and χ^2 difference tests were performed to identify the intervention path(s) that significantly differed by cognitive ability. Likewise, classroom type and teacher training were similarly accounted for.

Nonsignificant paths were pruned; models were tested for goodness of fit using the comparative fit index (CFI), Tucker–Lewis index (TLI), root-mean-square error of approximation (RMSEA), standardized root-mean-square residual (SRMR), and χ^2. Acceptable model fit was determined by CFI and TLI values >.90, RMSEA and SRMR values <.08, and nonsignificant χ^2 values (Hu & Bentler, 1999). Our sample of 177 participants exceeds the estimated sample size needed for continuous-time, one-person models (Hecht & Zitzmann, 2021).

Results

Preliminary Analyses

Social skills and internalizing behaviors data were each missing at 18%–29% across time points; participants who were missing one or more data points did not differ from those with complete data on demographic factors (child, parent, or teacher race or gender; child IQ status, age, or grade; household income, parent education, and number of parents in the household; classroom type; teacher training, education, or years of experience). Little's Missing Completely at Random (MCAR) test failed to reject that data were MCAR, $\chi^2(58) = 52.51$, $p = .679$, justifying use of full estimate maximum likelihood to account for missingness (Muthén & Muthén, 2017). Maximum likelihood estimation techniques have been found to perform better than listwise deletion, pairwise deletion, or multiple imputation (Enders & Bandalos, 2001; Schlomer et al., 2010). Skewness and kurtosis fell within acceptable ranges (+1 and −1 for skewness and +2 and −2 for kurtosis) for all key variables, with no outliers. Descriptive statistics are shown in Table 2. On average, autistic students demonstrated below average social skills across all three time points, with 32.0%–39.3% of children showing social skills in the borderline range or lower compared to normative data; mean scores fell in the 13–19th percentile. In addition, 33.3%–46.9% of children displayed internalizing behaviors in the borderline or clinical range, with mean scores falling in the 66–81st percentile compared to normative data.

Correlations between social skills and internalizing behaviors are displayed in Table 3. Social skills were highly correlated across Times 1 and 2 ($r = .80$) and moderately correlated across Times 2 and 3 ($r = .31$). Internalizing behaviors were less stable, showing a significant correlation only between Times 1 and 2 ($r = .67$).

Associations Between Social Skills and Internalizing Behaviors

We first examined whether internalizing behaviors and social skills exhibited bi- or unidirectional associations with one another over time, including internalizing behaviors and social skills variables at all three time points for the overall sample. The model included four sets of cross-lagged paths between internalizing behaviors and social skills across time, with IQ as a covariate. This model also included correlations between measures at the same time point, as well as autoregressive paths for each measure across time. The initial, full model including all paths indicated excellent fit; $\chi^2 = 1.86$, $p = .76$, RMSEA = 0.00 (0.00–0.08), CFI = 1.0, TLI = 1.0, and SRMR = 0.012. The cross-lagged path from Time 2 internalizing behaviors to Time 3 social skills was significant. No other cross-lagged paths were significant.

Figure 1 presents the final model in which nonsignificant paths were pruned. Model fit remained excellent across all indices; $\chi^2 = 6.41$, $p = .49$, RMSEA = 0.00 (0.00–0.09), CFI = 1.0, TLI = 1.0, and SRMR = 0.03. The significant cross-lagged pathway from Time 2 internalizing behaviors to Time 3 social skills ($\beta = -0.26$, $p = .002$) indicated that internalizing behaviors negatively predicted change in social skills from the Spring of 1 school year to the Winter of the next.

Cognitive Ability as a Moderator

Next, with IQ as a covariate, we compared a model fully constrained by cognitive ability to a model fully unconstrained by cognitive ability. The difference in fit between the constrained and unconstrained models was significant ($\chi^2 = 36.47$, $p = .004$),

Table 2
Teacher-Reported Internalizing Behaviors and Social Skills Across Time by Intellectual Disability Status

	Internalizing behaviors *T* score					
	Full sample ($n = 177$)		Cognitive delays ($n = 30$)		Without cognitive delays ($n = 147$)	
Time point	*M* (*SD*)	% in borderline or clinical range	*M* (*SD*)	% in borderline or clinical range	*M* (*SD*)	% in borderline or clinical range
IB Time 1	58.4 (10.2)	46.9%	59.2 (8.9)	60.1%	58.3 (10.4)	44.3%
IB Time 2	55.8 (9.6)	38.7%	60.0 (6.0)	62.5%	55.0 (9.9)	33.9%
IB Time 3	56.2 (8.8)	33.3%	57.1 (7.2)	38.1%	56.1 (9.1)	32.4%
	Social skills standard score					
Time point	*M* (*SD*)	% in borderline range or lower	*M* (*SD*)	% in borderline range or lower	*M* (*SD*)	% in borderline range or lower
SS Time 1	82.9 (15.4)	39.3%	72.5 (18.7)	71.4%	84.7 (14.1)	33.6%
SS Time 2	85.3 (15.3)	34.3%	71.7 (15.7)	78.3%	88.1 (13.6)	25.4%
SS Time 3	86.4 (14.6)	32.0%	73.2 (13.5)	70.0%	89.0 (13.5)	24.8%

Note. IB = internalizing behaviors; SS = social skills. Although missing data were estimated using full information maximum likelihood, these descriptives are based on original data.

Table 3
Correlations of Internalizing Behaviors at Social Skills at Each Time Point (N = 177)

Time points	1	2	3	4	5	6
1. Internalizing behavior, T1	—	−0.51***	0.67***	−0.45***	0.15†	−0.24*
2. Social skills, T1		—	−0.36***	0.80***	−0.01†	0.37***
3. Internalizing behavior, T2			—	−0.47*	0.31***	−0.31***
4. Social skills, T2				—	−0.15†	0.42***
5. Internalizing behavior, T3					—	−0.30**
6. Social skills, T3						—

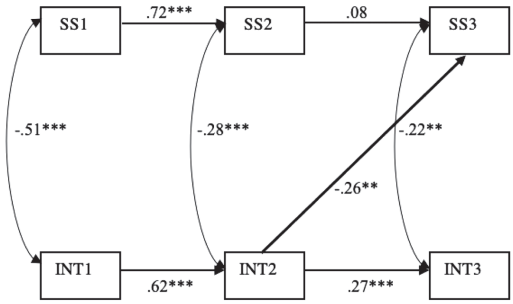
Note. T1 = Time 1; T2 = Time 2; T3 = Time 3.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$. † $p \geq .05$.

indicating that model fit improved once cognitive ability was accounted for. The unconstrained model reflected better fit (χ^2 = 6.09, df = 8, p = .64, Scaling Correction Factor of 0.9013), justifying further examination of which individual paths differed by cognitive ability. Individual paths were unconstrained to determine which led to significantly improved fit over the fully constrained model and therefore differed by cognitive ability. Only the path from Time 2 social skills to Time 3 social skills significantly differed by cognitive ability as indicated by a significant χ^2 difference test (χ^2 = 6.34, p = .01). Examination of the path separately by group indicates that the path was significant for youth with cognitive delays ($\beta = -0.27$, $p <$ .001) but not significant for autistic youth without cognitive delays ($\beta = 0.15$, p = .24). This was the only significant interaction effect detected.

Classroom Type and Teacher Training as Moderators

Next, we examined classroom placement as potential moderators of the paths. Classroom placement was based on the type of classroom (general education vs. special education) in which the child spent ≥50% of the school day. With IQ as a covariate, we compared a model fully constrained by classroom type to a model fully unconstrained by classroom type. The difference in fit between the constrained and unconstrained models was not significant (χ^2 = 20.75, p = .238), indicating that the paths did not significantly change once classroom type was accounted for. Next, teachers' autism training, defined as having received any professional training in autism, was examined dichotomously. With IQ as a covariate, we compared a model fully constrained by teacher training status to a model fully unconstrained by teacher training status. The difference in fit between the model constrained by teacher training status and the unconstrained model was not significant (χ^2 = 14.46, p = .209), indicating that paths did not significantly vary by teachers' autism training status.

Figure 1
Standardized Estimates of Pruned Cross-Lagged Panel Model Predicting Social Skills and Internalizing Behaviors for Autistic Students (N = 177)



Note. SS = social skills; INT = internalizing behaviors. The path from SS2 → SS3 was moderated by cognitive ability as follows: $\beta = 0.46$, $p < .001$ for autistic students with cognitive delays; $\beta = 0.07$, p = .61 for autistic students without cognitive delays.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

The transition to formal schooling is socially and emotionally demanding for all students (Vitiello et al., 2020), and especially for autistic students. We examined the associations between internalizing behaviors (e.g., anxiety, depressive symptoms, withdrawal) and social skills over time during the early elementary years for autistic students, using a longitudinal, cross-lagged design over three time points to identify early factors that predicted growth in either domain over time.

Consistent with past research (e.g., Gadow et al., 2012; Guttmann-Steinmetz et al., 2010), our sample of young autistic students began school with elevated internalizing behaviors and social difficulties: 46.9% exhibited internalizing behaviors in the borderline or clinical range and 39.3% had borderline or lower social skills. Notably, internalizing behaviors appeared less stable over the course of the 1.5-year period, calling in to question whether other factors aside from social skills not examined here (i.e., access to intervention or other therapeutic services, levels of adaptive functioning, the change in classroom from Times 1–2 to Time 3) may be responsible for driving these changes (Franchini et al., 2018).

Across a 1.5-year period, we observed that children's early levels of internalizing behaviors significantly predicted their growth in social skills. Namely, children with higher internalizing behaviors in the Spring of 1 school year showed attenuated growth in social skills during the following school year, while those with lower internalizing behaviors showed greater growth in social skills by the next school year. Early internalizing behaviors have similarly been shown to attenuate growth in adaptive behaviors for young autistic children (Franchini et al., 2018), further underscoring the ways in which early-emerging internalizing behaviors can stymie children's social competence over time. Notably, the pathway from Time 2 internalizing behaviors to Time 3 social skills extended across more than 1 school year, suggesting the potential power of anxiety and depressive symptoms to attenuate growth in social skills even in new classroom contexts with distinct demands, new teachers, and new social relationships (Mazurek & Kanne, 2010). This observation implies that

practitioners and educators could expect internalizing symptoms like anxiety to go closely hand-in-hand with social skills for autistic students, both synchronously and over time. At this time, however, replication of these findings is needed to strengthen this assumption given the small yet significant effect size ($\beta = -0.26$, $p = .002$) observed for this pathway. Our findings also mirrored past research whereby early social skills did not drive changes in internalizing behaviors over time (D. E. Jones et al., 2015). These patterns, in combination with the robust sample size, adequate recruitment strategies, and deployment of psychometrically sound measures aligned with our constructs of interest, give confidence in the conclusions drawn from the data. Despite these efforts to ensure internal validity, autism-specific patterns of development might also explain the observed findings, warranting the need for future research in this area.

Consistent with some prior research (Eussen et al., 2013) but in conflict with others (Gillott et al., 2001; Kanne et al., 2009; Mazurek & Kanne, 2010; Winch et al., 2022), cognitive ability, measured by IQ, did not appear to moderate changes in internalizing behaviors for this sample of young autistic students. The observed pathway between internalizing behaviors and social skills was significant for autistic children with and without cognitive delays. Likewise, the significant pathways also did not differ by classroom type or by whether teachers had received autism training. The path from early internalizing behaviors and later social skills, along with the other paths in the model, was similar between children in special education and general education classrooms and between children whose teachers did and did not have autism training. These findings suggest the need for interventions to address anxiety and other internalizing behaviors across autistic children of all cognitive abilities and across children in all classroom types that are nonetheless tailored to children's developmental needs (Kerns et al., 2021).

For autistic students without cognitive delays, early social skills appeared more consistent over time than that of their autistic peers with cognitive delays as indicated by the pattern observed for Time 2 to Time 3 social skills. This observation could perhaps be attributed to the level of social difficulties that are common for children with cognitive delays that should be considered when tailoring social–emotional interventions to developmental needs (de Bildt et al., 2005).

Implications

Our findings have implications for supporting autistic students' social development and emotional well-being. While these efforts are laudable, researchers, clinicians, and educators need to proceed cautiously in embracing "social skills" as an outcome for autistic children. We must critically consider what we mean by this term, ensuring that we employ social skills to refer to skills aimed at enabling social interactions in ways that promote self-determination or quality of life or align with individuals' goals. Existing measures of social skills do not consistently capture this definition; instead, existing measures and conceptions of social skills often conflate social skills with neurotypical behaviors and reduced autism characteristics. We need to listen to autistic students and former students who have noted that interventions targeting social skills can reinforce ableism and stigma (Spaeth & Pearson, 2021) and promote masking (Tierney et al., 2016), which have serious negative mental health ramifications (Hull et al., 2017), such as being experienced as traumatizing or as attempting to make students nonautistic (Kerns et al., 2022). Educators and school psychologists who want to support students' social development can mitigate these risks by intervening only in ways that are aligned with students' own goals, prioritize authenticity, and center self-determination (Bottema-Beutel et al., 2018; Cage & Troxell-Whitman, 2019).

This study expands upon the lack of research examining the early developmental cascades of internalizing behaviors and social skills for autistic students (Vaillancourt et al., 2017). Although our findings suggest the impact of early internalizing behaviors on future social skills consistent with that observed in nonautistic samples, the small yet significant effect size warrants the need for future research to replicate these findings. As it stands, these findings substantiate the need for educators to ensure that universal practices known to remediate internalizing behaviors for all students are in place, with attention to autistic students who are especially prone to social–emotional challenges during the early school years. School psychologists are uniquely positioned to advocate for and establish a multitiered approach to identifying and supporting autistic students who are likely experiencing internalizing behaviors within the school setting (Loftus-Rattan et al., 2023). Promisingly, even among teachers without prior training in autism, research with general education teachers shows that many regularly use evidence-based strategies for building strong relationships with autistic students and addressing their emotional needs within the context of their daily classroom routines (Bolourian et al., 2022).

The state of universal social–emotional screening in schools is fragmented (Dineen et al., 2022), and there is a dire need for researchers to develop culturally and contextually relevant measures that are sensitive to the needs of neurotypical and neurodivergent students alike. On the ground, school psychologists can advocate for the importance of routine, universally implemented social–emotional screening procedures to facilitate targeted efforts to promote the mental health of all students. In so doing, it is important to consider the limitations of teacher-reported screenings, especially for internalizing behaviors which are less observable than externalizing behaviors (Levinson et al., 2021). School psychologists can use this knowledge in consultation with teachers to improve symptom recognition (Zee & Rudasill, 2021). Moreover, building positive student–teacher relationships can also promote symptom identification while fostering autistic students' school connectedness (Eisenhower et al., 2015).

Consistent with a multitiered approach to *School Psychology* and relying on data-based decision making, Tier 2 group-based interventions to teach emotion coping skills and to foster reciprocal friendships may be especially valuable for autistic students (Rodda & Estes, 2018), as small groups may offer a protected space to foster friendships while providing autistic students with opportunities to develop further social competence. Progress monitoring within Tier 2 is also essential to determine when more intensive support is warranted (Loftus-Rattan et al., 2023).

Limitations and Future Directions

This study is limited by its reliance on teacher report as a sole indicator of internalizing symptomatology and social competence, unsubstantiated by behavioral observation or self-report data. Even so, internalizing behaviors are particularly challenging to detect, increasing the likelihood of underreporting (Stensen et al., 2022) or conflating these behaviors with autism-related symptoms (Pandolfi et al., 2014) when measured by teacher or parent report. To ensure

accurate classification, future research that examines internalizing behaviors in autistic students should include student self-report and parent report alongside behavioral observations. Due to secondary data analysis constraints, we were unable to obtain information related to adaptive functioning to confirm the presence of ID. Instead, we relied on FSIQ to account for cognitive ability. Future research should examine environmental conditions that reduce internalizing behaviors in young autistic students, in addition to whether similar intervention approaches are appropriate for autistic students with and without ID as a critical focus for future research (Baker & Blacher, 2020).

We determined that the pathways between internalizing symptoms and social skills did not vary by whether teachers had any professional autism training. However, future research ought to examine the role of teachers' autism training in a more nuanced manner, including the type and intensity of teachers' past autism-related training or experience. The trainings' orientation toward autism may be crucial. Training that is autism affirming and applies a neurodiversity lens is aligned with the recommendations of many autistic people (Gillespie-Lynch et al., 2022) and may prepare teachers to better support students' social and emotional development (Chung et al., 2015). Indeed, well-prepared teachers, who have received intensive or affirming autism training, may be better able foster autistic children's social gains even in the context of heightened internalizing symptoms early in school. Future research should also consider the interplay between the social behaviors measured here and the possible masking or social camouflaging in young autistic children, including the ways that social expectations may lead students to mask their autism characteristics and the potential impact of such masking on children's internalizing behaviors (Bernardin et al., 2021).

Finally, the generalizability of these findings may be limited by the underrepresentation of autistic students and teachers of color. Future lines of inquiry should address this limitation given the historical underrepresentation of Black, Indigenous and People of Color groups in autism research (D. R. Jones et al., 2020), alongside the known consequences of rater bias on the overidentification of Black males as having social–emotional challenges (Skiba et al., 2011).

Conclusion

These findings highlight the importance of attending to early internalizing behaviors in autistic students. Findings supported a symptom-driven pathway, whereby students' internalizing behaviors predicted changes in social skills over time for all autistic students regardless of cognitive ability, classroom type, or teacher training. School psychologists can use this knowledge to advocate for multitiered approaches to detect and mitigate internalizing behaviors for autistic students to improve later social–emotional and related outcomes.

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