

ORIGINAL ARTICLE

Autistic Children's self-reported social satisfaction: Comparison with observer- and teacher-reported perspectives

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Abstract

We conducted a small-scale exploratory study of how autistic children report on their loneliness and social (dis)satisfaction in the classroom, and whether child self-reports related to teacher-reported peer social integration or observed positive peer interactions. Child participants ($n = 18$) were in kindergarten through second grade, identified by their teachers ($n = 18$) as either having been diagnosed with or demonstrating the characteristics of autism. At three time points over roughly 4 months, teachers were surveyed about the peer social integration of their student, researchers observed student-peer interactions and students reported on their social satisfaction. Teacher reports of student social integration were positively correlated with observers' positive peer social interaction scores. However, child-reported loneliness was not correlated with either teacher-reported social integration or observer ratings of peer interactions. Autistic children consistently reported less loneliness than teacher and researcher observations of their socializing might suggest. We conclude that these young students may be using different criteria to evaluate their social satisfaction. We also reflect on neuro-normative measurement of autistic sociality. In future studies, autistic student self-reports about social connectedness and peer relationships should be considered, and more research on self-report and adult measurement tools in autism research is needed.

KEYWORDS

autism, children, neurodiversity, peer interaction, peer social integration, self-report, social satisfaction

Key points

- In past research, young autistic children were often not asked directly about their experiences of social connection in school settings, both because of structural discrimination against children and because of epistemic injustice affecting autistic people.
- In this exploratory study, young autistic children rated their feelings of loneliness and social connectedness. They consistently reported less loneliness and more social connection than their teachers' or the researchers' reports would imply. Child, teacher and observer measures seemed to capture different aspects of the children's classroom experiences.
- This paper highlights the need for more research that prioritizes self-report measures when inquiring about the social satisfaction of young autistic

children, so that we can better understand how they evaluate their social interactions and how outside observations may differ from the children's internal experiences.

- Current neuronormative instruments used in research or the school setting may not accurately measure the social behaviours of autistic children. Practitioners should be aware of potential confounds in observation tools, and future research should work directly with autistic individuals to develop new tools for validly measuring autistic social experiences.

Consistent with the 'nothing about us without us' movement (Charlton, 1998), understanding autistic students' self-reported experiences in the classroom, including their experiences of social connectedness, will facilitate their full educational inclusion (Kaplan-Kahn & Caplan, 2023). However, when measuring the friendships and loneliness of autistic children in school settings, most studies prioritize adult reports or observations, to the exclusion of student self-reports (Losh et al., 2022), and most have studied older children or adolescents (e.g., Bauminger & Kasari, 2000; Deckers et al., 2017; Locke et al., 2010; O'Connor et al., 2022). In research, autistic individuals, especially autistic children, have often been considered 'unreliable narrators and interpreters of social situations' (Chapman & Carel, 2022, p. 618; see also Bertilsdotter Rosqvist et al., 2023), but some studies show that young autistic children can reliably report on their internal experiences and social interactions if the questions are understandable to them (Bakhtiari et al., 2021; Zeedyk et al., 2016). The stated reason for the inclusion of adult reports in research is generally to guard against a child's acquiescent or extreme answering style (Chambers & Johnston, 2002) or the assumption that children cannot accurately report on their own experiences given their developmental level; however, the preference for adult reports over child reports in research in general likely also reflects structural discrimination against children and the fact that they often have little control over their education or healthcare (Adami, 2023; Wall, 2022). Other factors such as neuronormativity and the relative ethical and practical ease of obtaining adult reports compared to child self-reports are likely also to play a role in our reliance on adult report over child self-report in developmental research, even when this research is about children's internal states. Perhaps especially for children, developmentally appropriate self-report measures are recommended as part of an assessment of emotions and dispositions, as proxy reports alone have been shown to be insufficient for measuring subjective states (Mpundu-Kaambwa et al., 2021). Including child self-reports in research allows children to be 'not only research objects but research participants' (Wall, 2022, p. 258); reporting on their reliability and stability can provide further evidence of their trustworthiness.

SOCIAL PREFERENCES OF AUTISTIC CHILDREN

An important application for self-report measures is the social satisfaction of autistic children, who have been doubly excluded from research as children (Adami, 2023) and as autistic people (Botha & Cage, 2022). Research increasingly challenges previous assumptions about autistic sociality, including the lack of desire for friends. Multiple studies have shown that autistic children desire connection with others and feel loneliness when they are unable to make friends or have no one to play with (e.g. Calder et al., 2013; Libster et al., 2023), though autistic children's play can be qualitatively different from their allistic (i.e., non-autistic) peers (Wolfberg & Woods, 2023). Yet several studies show that older autistic children report less loneliness than assumed by their parents or teachers (Deckers et al., 2017; Fox & Asbury, 2024; Kwan et al., 2020). This apparent dialectic may be because some autistic children have different ideas than allistic adults or children about what constitutes a satisfying social interaction, preferring companionship in activities to conversation-based interactions (Bauminger & Kasari, 2000; Fox & Asbury, 2024; Zhao et al., 2025). However, some autistic children in an interview study (Fox & Asbury, 2024) also reported valuing emotional closeness with their friends, rather than only companionship. It is important to understand autistic children's own views of their social interactions, because autistic adults have expressed concern about the current intervention practices for autistic children (Walton et al., 2024), including in schools, which are often focused on changing their social communication styles (Nadwodny et al., 2026; Wei et al., 2014). The heterogeneity in desired friendship characteristics, loneliness and social experiences reported in studies of older autistic children support the need for similar research asking younger autistic children directly about their social experiences. The result may be improvements in understanding the social needs and preferences of these important stakeholders in educational practices, young autistic children themselves.

When self-evaluating their peer interactions, some autistic children define concepts like loneliness and friendship differently than the allistic people around them (Ólafsdóttir et al., 2025; Petrina et al., 2014). In a

qualitative meta-synthesis, Fox et al. (2024) found that autistic children wanted to have friends, preferred small friend groups, valued long-lasting friendships, enjoyed companionship during activities and noticed when they were being excluded. Further, this analysis found that adult reports of autistic children's social engagement tended to misunderstand their friendships. Because allistic adults may be predisposed to misinterpreting autistic children's social needs and preferences, it follows that instrument selection is important when using multiple measures to study autistic children's social behaviour. Neuro-normativity frames 'neurotypicality as the sole acceptable or superior mode of cognition, and... stigmatizes attitudes, behaviours or actions that reflect neuroatypical modes of cognition as deviant or inferior' (Catala et al., 2021, p. 9016; see also Pellicano & den Houting, 2022). Thus, if neuro-normative social standards are assumed systemically in self- and adult-report research instruments measuring the children's social experiences and feelings, we may perpetuate epistemic injustice (Legault et al., 2024), which is 'a wrong done to a person specifically in their capacity as a knower' (Fricker, 2007, p. 1).

TESTIMONIAL EPISTEMIC INJUSTICE AND AUTISTIC CHILDREN

Due to structural discrimination against children, assumptions about neuro-normativity and the prioritization of allistic perspectives on autistic experiences, discrepancies in research between autistic child self-reports on social well-being and the reports of external observers have historically often been resolved by characterizing the self-reports as misperceptions or an inability of the autistic children to report accurately or understand themselves fully (e.g. Chamberlain et al., 2007). This is despite the fact that when looking at internal states like effort and enjoyment, the self-reports of allistic children also tend to correlate weakly with adult reports (Renk & Phares, 2004; Skinner et al., 2009) or show higher levels of emotions than their parents report (e.g. anxiety, Keith et al., 2019). When autistic children are afforded less credibility than their allistic peers of similar age and cognitive abilities, this results in the prejudicial 'credibility deficit' (Fricker, 2007, p. 17) of testimonial epistemic injustice (Fisher et al., 2025). The injustice in this case is not only toward the individual whose testimony is doubted; when autistic children are not allowed to report on their experiences at the micro level, society is also wronged at the macro level by lacking the knowledge they possess (Catala et al., 2021) and by lacking 'the concepts and language to value and understand non-neuro-normative contributions, known as hermeneutical injustice' (Fisher et al., 2025, p. 3). As a result of this missing knowledge and language,

adults misinterpreting the social interactions of autistic children in schools can have important implications for the children's lives and future mental health, especially if the autistic child's preferred ways of socializing are stigmatized (Berkovits et al., 2020; Botha & Frost, 2020; Kwan et al., 2020).

Milton et al. (2022) theorized that while autistic people may have difficulty understanding the motivations and emotions of others, allistic people also have difficulty understanding the motivations and emotions of autistic people. This mutual misunderstanding or 'double empathy problem' is often evident in adults' interpretations of autistic children's play and social behaviours in the classroom (Wolfberg & Woods, 2023). Therefore, solely using instruments, whether direct observation or observer-report surveys, that were designed with neuro-normative play and sociality in mind to measure the social interactions of autistic children is inherently problematic. Combining such measures with child self-report, then, is especially important for autistic children; indeed, there is a need for research that prioritizes the child reports when interpreting the adult reports.

THE PRESENT STUDY

The purpose of this study was to (1) examine social experiences in the classroom as self-reported by young autistic children and (2) investigate whether and how these self-reports of loneliness and social satisfaction relate to teacher-reported social integration and researcher observations of social behaviour in the classroom. The following research questions were investigated:

1. How do autistic children in kindergarten through 2nd grade report on their feelings of loneliness and social satisfaction at school?
2. Are the self-reported loneliness and social dissatisfaction of autistic children related to teacher-reported social integration and observed positive peer social interactions?
3. Are the reports of child social interactions provided by the child, teacher and researcher-observer stable over time?

METHODS

Child participants in this small-scale, exploratory study ($n = 18$) were in kindergarten through second grade general education or inclusion classrooms in the United States for 50% or more of the school day, and were identified by their teachers ($n = 18$) as either having been diagnosed with or demonstrating the characteristics of autism. Each participating teacher nominated one child in their class for inclusion in the larger study, and parents provided information about their child's formal autism

diagnosis if they had received one; all parents filled out measures of their child's autistic traits to ensure they met study criteria. Teacher/autistic student dyads were recruited from elementary schools in the two U.S. states of California and Massachusetts. The behavioural observations were exploratory and conducted only with the first cohort of a three-cohort study, resulting in a small sample size.

Consistent with previous autism diagnosis rates by sex assigned at birth (Shaw et al., 2025), most child participants were male ($n=13$); race/ethnicity was diverse (Black=2, Asian=2, Latiné=4, White=5, bi-/multi-racial=4; missing=1). Family income was reported as follows: 33% \$125,001 or more; 22% \$75,001–\$125,000; 39% below \$75,000; 6% missing. The teacher participants were majority white (72%) and all female; all had at least a college education, but 83% had a master's degree.

Researcher positionality and autistic community involvement

The authors include one autistic team member, two other neurodivergent team members and two allistic (non-autistic) team members. Research team members bring lived experience in school as autistic and neurodivergent former students themselves and as parents of autistic people, and professional experiences as classroom teachers (general and special education), as psychologists conducting therapy and assessments, and as autism researchers. In addition, the observers/child interviewers, who were overlapping with the authors but were not all authors, included three autistic members, two who otherwise identify as neurodivergent, and three who do not identify as neurodivergent. Reflexive journaling and discussion with fellow coders during weekly coding meetings enabled coders to reflect on the impact of their own lived experiences, beliefs and identities on their coding decisions. Intentional steps to make space for the perspectives of team members with marginalized identities included having weekly coding team meetings led by a neurodivergent team member and inviting multiple forms of communication. Post hoc reflection on the observational measure in particular gave rise to the current study. However, the non-autistic identities of most of the principal investigator-level leaders of the larger study from which this is drawn perpetuate problematic power dynamics in autism research (Pukki et al., 2022; Sheldon, 2017).

The larger study from which the current project derives also incorporates a community advisory board, which includes stakeholders such as autistic youth and adults, teachers and parents or caregivers of autistic children. The advisory board members' input through regular meetings both shapes the research programme as a whole and offers reflexive participatory feedback on lines of inquiry in progress. Preliminary results from

this study were presented to the advisory board and their input was incorporated into the final work. Additionally, the autistic child participants' voices were centred by treating their reports of social satisfaction as correct for their experiences and seeking to understand how the child and adult reports differ. Finally, a narrative was built from the results of one representative child to attend to the 'story of data collection' (Truijens et al., 2023, p. 2) within this small-scale quantitative study to improve validity and illustrate how the children viewed their social interactions differently than the teachers or observers did.

Measures

Child measure

To measure self-reports of loneliness and social (dis)satisfaction, we administered a brief (8-item) version of the Loneliness and Social Dissatisfaction Questionnaire (LSDQ, Cassidy & Asher, 1992). LSDQ was selected as it has been used with both typically-developing and autistic children to measure loneliness and social relationships, and children who rated higher loneliness on this measure tended to also be more disruptive in class, have fewer social relationships, and experience more bullying (Zeedyk et al., 2016). The full LSDQ scale was adapted for use with 4- to 7-year-old autistic children in the 8-item form used in this study and validated with this population by Zeedyk et al. (2016), who found a Cronbach alpha of 0.68 for the total 8-item brief LSDQ score.

In this study, each child was administered the scale verbally in a comfortable location chosen by the teacher and student to afford privacy while answering the questions about loneliness and friends. Students were invited to the selected area either verbally, using hand-under-hand prompting, or using an object as a transition prompt, and asked for assent before proceeding with the scale administration (See Supplemental Materials 1 and 2 for child assent procedure and administration script). The assent and measures were written in plain language. For non-speaking or minimally verbal students, simple alternative and augmentative communication options were presented including a 'yes' and 'no' choice board, gestural presentation and writing to respond. To ensure that children understood the process, they were first asked to endorse simple yes or no questions (e.g., 'I like to play games', 'I am happy when I can go to recess', 'I like to get out of school early') and the measure was administered once it was clear the child understood and could answer questions. Additionally, the LSDQ includes redundant questions. Researchers noted whether the children's answers seemed to be internally consistent during administration and recorded their perceptions of the child's comprehension of the measure at the end of

each classroom visit for discussion with the data collection team. Both verbal and nonverbal responses were accepted. Some children (six different children at each time point) refused or revoked assent during the scale administration, although data collection methods were adapted to maximize access (Kenny et al., 2023; Rasmussen & Pagsberg, 2019). Children were approached and asked to participate anew at each visit to their classrooms for data collection; if they verbally refused to answer questions or walked away from the chosen area for scale administration at any point during data collection, this was accepted as refusing assent. Their data was treated as missing for that time point only if the child did not answer any questions at all. Child answers of 'I don't know,' 'yes', 'sometimes', or 'no' were scored 0, 1, 2 or 3, resulting in a total score between 0 and 24 at each time point. Higher scores signify less loneliness and greater social satisfaction. In this sample, the 8-item LSDQ scale had borderline internal consistency at Time 1 ($\alpha = 0.61$, $n = 13$) and Time 3 ($\alpha = 0.66$, $n = 13$), and good internal consistency at Time 2 ($\alpha = 0.85$, $n = 13$).

Teacher measure

Teachers reported perceptions of their autistic student's social behaviour via survey. The Social Competence and Behaviour Evaluation (SCBE, LaFreniere & Dumas, 1996) Isolated-Integrated subscale contains 10 items drawn from a larger scale that was not administered in full, as it also measures other constructs such as internalizing and externalizing problems that are not relevant to the current study. The SCBE Isolated-Integrated subscale measures peer social integration using similar wording to the items on the child-report measure, on a 6-point scale from 1 (almost never occurs) to 6 (almost always occurs), giving a total score between 10 and 60 at each time point. Higher values denote more peer social competence. SCBE Integrated-Isolated subscale showed good internal consistency when used to measure teacher perceptions of young autistic children's socializing, with alphas of 0.87–0.90 in Feldman et al. (2022) and 0.89–0.90 in Losh and Blacher (2023). In this sample, the 10-item SCBE Isolated-Integrated Scale had acceptable to good internal consistency at all time points: Time 1 $\alpha = 0.76$ ($n = 18$), Time 2 $\alpha = 0.80$ ($n = 17$) and Time 3 $\alpha = 0.84$ ($n = 18$).

Observer Measure

The inCLASS observation schedule (Downer et al., 2010) was used to observe the child's peer social behaviour in the classroom. The inCLASS was developed as a context-based observational tool for use in early childhood classroom settings to measure teacher-student interactions, peer interactions and task engagement, because all three domains are known to influence student success (Downer et al., 2010). It

measures behaviours such as proximity-seeking, shared positive affect, conversational turn-taking and joining or organizing play. The inCLASS has shown good reliability with preschool samples (Booren et al., 2012; Downer et al., 2012) and there is preliminary evidence of good psychometric properties in autistic samples (Fasano et al., 2023). Observers in our study completed a two-day training on the inCLASS and achieved reliability on all domains by coding videos before completing classroom observations. Each observation included time for five, 15-min cycles of inCLASS observation and coding at any time of day when the teacher was interacting with her focal student or the class as a whole. Thus, observations could take place during whole-group instruction, recess or other classroom activities, to get an overall sample of the classroom interactions. Twenty percent of inCLASS observations were coded by two observers, who achieved at least 80% reliability over all intervals for all codes. Along with dimensions relating to teacher-student interactions and academic engagement, the inCLASS comprises four peer socialization dimensions: Peer Sociability, Peer Communication, Peer Assertiveness and Peer Conflict. The three positively-valenced peer interaction competency dimensions (i.e. excluding Peer Conflict) were selected for analysis since they align with the peer socialization competencies measured by LSDQ and SCBE.

At each time point, inCLASS scores on a scale of 1–7 (1–2 Low, 3–5 Mid and 6–7 High) were averaged across the five coding cycles, resulting in a score from 1 to 7 for each dimension. Unique to this study, the three positive peer interaction dimension scores were summed at each time point to create a total inCLASS Positive Peer Interaction (PPI) score, ranging from 3 to 21, where higher values reflect more positive peer social interactions. Because the raters at each time point were drawn from a pool of trained observers and because we were interested in the overall total scores at a group level, the inCLASS PPI total score was assessed by a two-way random-effects model intraclass correlation with consistency for average measures, ICC (2, 3) = 0.75, 95% CI [0.42, 0.91], which yields moderately good reliability using the categories established by Koo and Li (2016). Interrater reliability for each dimension separately ranged from moderate to good (see Koo & Li, 2016): Peer Sociability ICC (2, 3) = 0.78, 95% CI [0.49, 0.92]; Peer Assertiveness ICC (2, 3) = 0.60, 95% CI [0.07, 0.85]; Peer Communication ICC (2, 3) = 0.71, 95% CI [0.34, 0.89].

Procedures

All participants in this study were involved in a larger study of an autism-focused teacher professional development (PD) programme (Hamsho et al., 2024); teachers paired with an autistic student and participated in training and coaching activities designed to improve

their student-teacher relationships and teacher knowledge of autism and neurodiversity. Data were collected at three time points over a four-month period: Time 1 was before the teacher professional development (PD) in the larger study began for all participants; for participants randomly assigned to the intervention group, Time 2 was immediately after the teacher completed the PD, and Time 3 was 4 weeks after the PD was completed. For those in the control group, the PD programme began within 2 weeks of completion of the Time 3 measures. At each time point, teachers were surveyed via Qualtrics about the peer social integration of their participating student, and an observation team visited each teacher/student pair's classroom to observe student-peer interactions and to collect the child self-reports via structured verbal administration of the scale. The intervention may have impacted the quality of peer interactions for the intervention group children by the end of the study, as peers could have observed their teacher positively interacting with the autistic student. However, the intervention was designed to improve student-teacher relationships and did not specifically include a peer interaction intervention component.

Institutional review board approval was obtained at the two universities involved and all teacher participants gave informed consent; caregiver consent was obtained for child participants and the children themselves gave assent. Participant privacy was carefully maintained throughout the study and data were de-identified for analysis.

RESULTS

Data were analysed using nonparametric tests for examination of Likert scores and non-normally distributed observation scores (inCLASS). See Table 1 for mean total scores at each time-point for child-reported loneliness and social (dis)satisfaction, teacher-reported peer social

integration and observed positive peer interactions. In all calculations, missingness in the child-report data was dealt with using pairwise deletion; thus correlations have a smaller sample size than some item descriptives. Cronbach alpha showed borderline to good internal consistency for the child-report measure ($\alpha = 0.61\text{--}0.84$), and acceptable to good internal consistency of the teacher-report measure ($\alpha = 0.76\text{--}0.84$). Intraclass correlations showed moderately good interrater reliability for the observer-report measure, ICC (2, 3) = 0.75. However, the small sample size in the current study means that these coefficients should be interpreted with caution.

Measures' stability over time

First, we addressed the question of whether the child-, teacher- and observer-reports were stable over time. Friedman's tests were conducted, which are well-suited for determining significant differences between means of repeated measures of a single group when the data is ordinal and nonparametric, and the sample size is greater than 5. No significant differences in mean total scores between time points were found for child-reported loneliness/social dissatisfaction, teacher-reported peer integration or observed positive peer interaction, indicating that the mean scores did not significantly change over time (See Table 1). Next, Kendall *tau-b* correlations were conducted; whereas Friedman's test examines the stability of the overall mean scores for each measure, Kendall *tau-b* coefficients examine the association between sets of ranked data, such as Likert scales. Kendall's *tau-b* is unitless, robust with small samples and many tied ranks, and useful for nonparametric data that are monotonic and ordinal. *Tau-b* correlations were calculated for each measure between time points to measure stability of the Likert scale ratings and ordinally ranked observation scores over time (See Table 2). Given our small sample size and thus limited statistical power to

TABLE 1 Mean total scores and scaled scores for all measures.

Mean total scores and scaled mean scores, with Friedman's test					
	Range	Time 1 (SD)	Time 2 (SD)	Time 3 (SD)	Friedman's test
LSDQ Mean Total Score ($n = 12$, 12, 12)	12–24	17.25 (3.46)	19.08 (3.18)	18.33 (3.47)	$\chi^2(2) = 0.207$, $p = 0.902$
LSDQ Scaled Mean Total Score		7.19 (1.45)	7.95 (1.23)	7.64 (1.45)	
SCBE Mean Total Score ($n = 18$, 17, 18)	17–54	33.17 (8.22)	36.06 (7.56)	35.83 (7.60)	$\chi^2(2) = 3.541$, $p = 0.107$
SCBE Scaled Mean Total Score		4.63 (1.64)	5.21 (1.51)	5.17 (1.52)	
inCLASS PPI Mean Total Score ($n = 17$, 17, 16)	3–15	5.91 (2.52)	5.04 (1.48)	5.39 (2.87)	$\chi^2(2) = 2.10$, $p = 0.350$
inCLASS PPI Scaled Mean Total Score		1.38 (1.20)	1.13 (0.82)	1.32 (1.59)	

Note: LSDQ is child self-report; SCBE is teacher-report; inCLASS is observer-report.

TABLE 2 Kendall *tau-b* correlations for child-report, teacher-report and observer-report measures, T1-T3.

		LSDQ Total T1	LSDQ Total T2	LSDQ Total T3	SCBE Total T1	SCBE Total T2	SCBE Total T3	inCLASS PPI Total T1	inCLASS PPI Total T2	inCLASS PPI Total T3
LSDQ Total T1	Correlation Coefficient	—								
	Sig. (2-tailed)									
	N	12								
LSDQ Total T2	Correlation Coefficient	0.119	—							
	Sig. (2-tailed)	0.647								
	N	10	12							
LSDQ Total T3	Correlation Coefficient	0.485	0.361	—						
	Sig. (2-tailed)	0.084	0.167							
	N	9	10	12						
SCBE Total T1	Correlation Coefficient	0.095	0.032	−0.129	—					
	Sig. (2-tailed)	0.677	0.889	0.575						
	N	12	12	12	18					
SCBE Total T2	Correlation Coefficient	0.097	0.019	0.000	0.512 ^a	—				
	Sig. (2-tailed)	0.690	0.937	1.000	0.005					
	N	11	11	11	17	17				
SCBE Total T3	Correlation Coefficient	0.222	0.080	0.081	0.327	0.517 ^a	—			
	Sig. (2-tailed)	0.330	0.727	0.725	0.066	0.005				
	N	12	12	12	18	17	18			
inCLASS PPI Total T1	Correlation Coefficient	0.381	0.058	0.289	0.494 ^a	0.522 ^a	0.595 ^a	—		
	Sig. (2-tailed)	0.114	0.811	0.233	0.007	0.006	0.001			
	N	11	11	11	17	16	17	17		
inCLASS PPI Total T2	Correlation Coefficient	0.132	−0.190	−0.114	0.309	0.397 ^b	0.348	0.379 ^b	—	
	Sig. (2-tailed)	0.581	0.429	0.635	0.089	0.037	0.056	0.038		
	N	11	11	11	17	16	17	17	17	
inCLASS PPI Total T3	Correlation Coefficient	−0.250	−0.092	−0.170	0.213	0.176	0.060	0.291	0.346	—
	Sig. (2-tailed)	0.321	0.717	0.477	0.258	0.370	0.751	0.123	0.064	
	N	10	10	11	16	15	16	16	16	16

Note: LSDQ is child self-report; SCBE is teacher-report; inCLASS is observer-report.

^aCorrelation is significant at the 0.01 level (2-tailed).^bCorrelation is significant at the 0.05 level (2-tailed).

detect significance, we emphasized association strength over p -value in our interpretation of correlation results. We used the following effect size scale for Kendall τ - b association strengths (Gignac & Szodorai, 2016; Gilpin, 1993): small τ - $\beta \geq 0.07$, medium τ - $\beta \geq 0.13$, large τ - $\beta \geq 0.20$. The child self-reports had a small association from T1 to T2, and a large association between both T2-T3 and T1-T3. The teacher-reports and observer-reports were very stable, with large association strengths at all three time points. Levels of missingness varied across time points, especially for the child-report data. Overall, the child self-reports show less evidence for stability over time than the teacher-reports and observer-reports, but the means for all three measures were consistent between time point administrations.

Synchronous correlations between measures

To address whether the child self-reports of loneliness and social (dis)satisfaction, teacher-reports of social integration, and observed peer interactions are related within each timepoint, Kendall's τ - b correlations were calculated in pairs (child-teacher, child-observer and teacher-observer) using the total summed scores for each measure at all time points (see Table 2). Teacher-reported peer integration and observed positive peer interaction at both Time 1 and Time 2 were significantly positively correlated, with large association strength. For Time 3, there was little association between teacher-reported peer integration and observed positive peer interaction. In contrast, no significant correlation was found between total child-reported loneliness and social dissatisfaction and total teacher-reported peer integration, or between child-reported loneliness and social dissatisfaction and observed positive peer interaction at any of the three time points, and the association strengths were small or negative.

Scaled scores of all measures for comparison

Because the child-report measure, teacher-report measure and observer measure were all on different scales, the mean total scores at each time point were converted to a 1 to 10 scale for comparison. The equation was $Y = [(X - X_{\min}) / (X_{\max} - X_{\min})]n$, where n is the upper limit of the rescaled variable (10), and each measures' theoretical minimum (e.g. LSDQ score of 0 on all eight items for a minimum of 0), maximum (e.g. LSDQ score of 3 on all items for a maximum of 24) and range were used for conversion (see Table 1 for scaled means). Higher scores on each measure indicate more social connectedness and less loneliness. When adjusted to the same scale, the student ratings were the highest, with teacher ratings less positive, and observer ratings markedly lower.

Child self-report loneliness and social (dis)satisfaction: Item-level results

Next, to address how autistic children report on their loneliness and social (dis)satisfaction at school, individual item level descriptive statistics were calculated (See Table 3). Though the primary analysis uses overall total scores, the item-level results tell a nuanced story and more closely reflect the children's social experiences in the classroom. Overall, a majority of the autistic children said 'no' when asked both 'Are you lonely at school?' and 'Do you feel alone at school?'. Similarly, many children said 'sometimes' or 'yes' when asked 'Do you have lots of friends at school?' and 'Do you have kids to play with at school?'. However, they also expressed that their friendships and connections might have been difficult to achieve: most of the children said 'sometimes' or 'yes' when asked 'Is it hard for you to make friends at school?' and 'Is it hard to get kids to like you at school?'. When asked 'Do the kids at school like you', though most children answered affirmatively, 11.8% said 'I don't know'. This was the only question where some children said 'I don't know' at every time point. Some of the children had difficulty knowing whether the other children in the class liked them.

Relationships between child and adult reports: Individual child spotlight

Due to missingness and small sample size, we could not calculate item-level correlations to provide a more detailed understanding of how the child, teacher and observer reports relate to each other in answer to research question 2. Instead, item-level means were calculated for the teacher-report measure and compared to item-level means of items with similar content in the child self-report measure to look for patterns in discrepant answers before comparing to the observer-report scores, which were in the *Low* range for all children (See Supplemental Material 3 for a table of item level descriptive results for the teacher-report measure). From this analysis, we narratively highlight the LSDQ, SCBE and inCLASS results of one participant child who illustrates a common pattern of agreement and disagreement between the child and adult reports. Most importantly, in this study where prioritization of the child reports is an important goal, it allows one autistic child to speak for himself. 'Sal' (a pseudonym) is an autistic, male, Latino kindergartener.

Sal and his teacher disagreed on some aspects of his socializing: Sal expressed that he does not feel lonely and does have many kids to play with, but his teacher reported that he may have few social connections. Sal's teacher reported that he 'often' 'remains apart, isolated from the group'. Meanwhile, on similar items on the self-report measure, 'Are you lonely at school?' and 'Do you feel left out of things at school?' Sal said, 'No'. On the teacher-report items related to his interactions with

TABLE 3 Children's self-report loneliness and social (dis)satisfaction on the LSDQ.

LSDQ item (verbally administered)	Answer (numeric value for analysis)	Time 1 percent (n = 13)	Time 2 percent (n = 15)	Time 3 percent (n = 13)	Overall mean percent
LSDQ Item 1 'Are you lonely at school?'	No (3)	46.2	66.7	53.8	55.6
	Sometimes (2)	23.1	13.3	30.3	22.2
	Yes (1)	30.8	6.7	15.4	17.6
	Don't know (0)		13.3		
LSDQ Item 2 'Do you feel alone at school?'	No (3)	53.8	66.7	61.5	60.7
	Sometimes (2)	7.7	6.7	30.8	15.1
	Yes (1)	38.5	26.7	7.7	24.3
	Don't know (0)				
LSDQ Item 3 'Do you feel left out of things at school?'	No (3)	30.8	60.0	53.8	48.2
	Sometimes (2)	30.8	6.7	38.5	25.3
	Yes (1)	38.5	33.3	7.7	26.5
	Don't know (0)				
LSDQ Item 4 'Is it hard to get kids to like you at school?'	No (3)	23.1	13.3	30.8	22.4
	Sometimes (2)	23.1	33.3	23.1	26.5
	Yes (1)	53.8	40.0	46.2	46.7
	Don't know (0)		13.3		
LSDQ Item 5 'Is it hard for you to make friends at school?'	No (3)	23.1	26.7	23.1	24.3
	Sometimes (2)	7.7	13.3	38.5	19.8
	Yes (1)	69.2	46.7	38.5	51.5
	Don't know (0)		13.3		
LSDQ Item 6 'Do you have lots of friends at school?'	No (1)	14.3	13.3	23.1	16.9
	Sometimes (2)	21.4	6.7	38.5	22.2
	Yes (3)	64.3	60.0	38.5	54.3
	Don't know (0)		20.0		
LSDQ Item 7 'Do you have kids to play with at school?'	No (1)	7.7	6.7	0.0	4.8
	Sometimes (2)	23.1	6.7	30.8	20.2
	Yes (3)	69.2	86.7	69.2	75.0
	Don't know (0)				
LSDQ Item 8 'Do the kids at school like you?'	No (1)	15.4	0.0	15.4	10.3
	Sometimes (2)	15.4	33.3	23.1	23.9
	Yes (3)	61.5	46.7	53.8	54
	Don't Know (0)	7.7	20.0	7.7	11.8

other children, Sal's teacher reported that he almost never talks/interacts in groups and does not usually appear to delight in playing with other children. In contrast, when asked if he has lots of friends at school, if he has kids to play with at school, and whether the kids at school like him, Sal said, 'Yes'. Sal's teacher seemed to view him as on the periphery of the social groups in the

classroom, but Sal seemed to be satisfied with his level of social interaction.

Sal and his teacher agreed on Sal's difficulty making connections in the classroom. Sal's teacher reported that he sometimes 'Does not respond to other children's invitations to play', and that he almost never 'Initiates or proposes games to other children'. Sal seemed to have

difficulty making or receiving those social overtures in the teacher's view, and he agreed: in answer to both, 'Is it hard to get kids to like you at school?' and 'Is it hard for you to make friends at school?', Sal said, 'Yes'.

On the items where teacher-report questions consider the behaviour of other children, Sal's teacher reported that other children may sometimes exclude him in play and may ignore him in groups. She reported that sometimes 'Children seek this child out to play with them', and that Sal almost always 'Goes unnoticed in a group'. These ratings suggest that Sal is satisfied with his level of socialization, despite some exclusion from his classmates. When observed in the classroom using inCLASS, Sal received a mean PPI score of 1.53 out of 7 at Time 1, 1.07 at Time 2 and 1.13 at Time 3. These scores fall in the *Low* range for positive peer social interaction, indicating that observers recorded minimal reciprocal social interactions. Taken together, Sal reported more positive feelings about his socializing than the researcher-observed low levels of peer interactions might indicate. Sal also reported having more satisfactory peer interactions than his teacher observed, though both he and his teacher reported that Sal may be experiencing some social exclusion.

DISCUSSION

This small-scale, exploratory study provides preliminary results challenging the assumption that when young autistic children are seen often alone in a classroom, they feel lonely. Teachers reported that the children in our study appeared to have fewer social connections than did their peers, but in contrast, the children themselves reported that they had friends and children to play with. Our LSDQ item mean scores are similar to those reported by Zeedyk et al. (2016) in terms of the high percent of children endorsing *not* feeling lonely at school, as well as reporting having friends or peers to play with at school. Also similar to Zeedyk and colleagues, more autistic children in our sample said it was difficult to make friends at school than the allistic children did in the original LSDQ validation study (Asher et al., 1984).

The weak correlation between child-reported loneliness and teacher-reported aspects of loneliness in the current study is also consistent with previous research (Calder et al., 2013; Warren et al., 2021). There are a number of potential explanations for this finding: the children may have been hesitant to share their feelings of loneliness with an unfamiliar adult, and also may have engaged in self-presentation strategies by answering the items in a more socially appropriate way rather than how they actually felt, though children younger than 8 years do not typically use these strategies (Gernsbacher et al., 2020; Scheeren et al., 2016). Another possible explanation for this low association

in our sample may rest in the common pattern of results represented by our spotlight child, Sal. Both Sal and his teacher perceived his difficulty in making friends, and the teacher may have viewed the connections Sal did make as being less personally satisfactory. For some children, a friend or satisfactory companion might really be simply someone with whom they play at school (Fox & Asbury, 2024) and not necessarily a reciprocal companion. Future research should further explore the criteria autistic children use for determining their satisfaction with social interactions in the school setting so that those criteria can be reliably and validly measured.

The teacher reports and observer reports, and to a lesser extent the student self-report measures, all showed some evidence of stability over time. Though some of the correlations were non-significant, Kendall's *tau-b* values indicated several medium to large associations, which may be significant in a larger sample. Though Cronbach alphas showed borderline internal consistency at Time 1 and Time 3 for the child-report measure, item analysis and possible removal of items may improve the alpha in a larger sample.

As evidenced by the differences in the scaled scores between measures, each seemed to be capturing different aspects of the target child's classroom interactions. While some degree of discordance between different informants is commonly observed across child and adult reports, particularly with respect to internalizing constructs (e.g. Youth Self-Report as examined by Ebesutani et al., 2011), considering all informant reports can provide a fuller picture of the social situations under study (Achenbach et al., 1987). The purpose of a study, as well as the characteristics of the participants, should determine whether the discrepancy between informants is meaningful or speaks to the reliability of any one measure (Renk & Phares, 2004). As these data were collected as part of a larger study of a teacher professional development programme to improve student-teacher relationships for autistic students, the intervention itself may have positively impacted teachers' perceptions of their target students' behaviours or classroom dynamics. However, inCLASS observation ratings were likely not influenced by the intervention because it did not target peer interactions. A large discrepancy between two reports, such as we observed between the child self-reports and the inCLASS observation ratings when placed on the same scale, suggests that in this sample the autistic child's social behaviour and interactions may be misinterpreted through the inCLASS codes, illustrating the double empathy problem (Milton et al., 2022). To our knowledge there is little published research on the use of inCLASS with autistic children (e.g. Fasano et al., 2023). While inCLASS has been validated and used successfully with children in the general population (Booren et al., 2012; Downer et al., 2010), it was not designed specifically

for observing autistic children and our exploratory results suggest further research is needed.

While not the purpose of this study, the differences in the perspectives between autistic children, their teachers, and researcher-observers gave rise to methodological reflection. Exploratory post-hoc examination of our results and the measures we used led us to notice that aspects of the inCLASS peer interaction codes are consistent with the *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition Text Revision* (DSM-V-TR) diagnostic criteria for autism spectrum disorder (American Psychiatric Association/APA, 2022). The 'gold standard' *Autism Diagnostic Observation Schedule, 2nd Edition* (ADOS-2; Lord et al., 2012) operationalizes DSM criteria with wording similar to low scores for inCLASS peer interaction domains, so someone conducting an autism diagnostic observation would be noting the same behaviours as someone who is conducting a classroom peer social integration observation using inCLASS. For example, both the autism diagnostic criteria and scores in the *Low* range on inCLASS peer interaction subdomains mention lack of eye contact and lack of reciprocal smiles (i.e. social communication differences), responding nonverbally or not at all to conversational attempts (i.e. difficulty with reciprocal social interaction), and sticking to one topic of conversation only (i.e. restricted and repetitive behaviours). Researchers should be aware of this conundrum, because they may really be measuring autism diagnostic characteristics instead of social integration when inCLASS is used with young autistic children.

Beyond the inCLASS, autistic children in general or special education classrooms in the United States are often observed for evaluation of progress toward their Individualized Educational Program (IEP) goals, which may involve social skills (Ruble et al., 2010). Observations of autistic children for the purpose of evaluating social interactions should take possible differences in sociality into account, such as different facial expressions and mannerisms than allistic children express when they are in a positive peer interaction (Trevisan et al., 2018). Additionally, the children's own social preferences should be incorporated, since they may have stronger connections with other autistic children (Chen et al., 2022), may value being liked by their classmates more than reciprocal friendships (Tsou et al., 2025), and may need less overall interaction than their allistic peers to feel satisfied with their friendships (Deckers et al., 2017). Though research has documented these differences in the social styles of autistic children, many of the same studies also found that they experienced exclusion by their allistic classmates or difficulty making friends (Calder et al., 2013; Chen et al., 2022; Fox & Asbury, 2024; Tsou et al., 2025), so some of these differences may be adaptive. Future research might work directly with autistic individuals to develop neuro-affirming observational tools that

reflect these potential differences, the heterogeneity of autistic social styles, and the impact of other children's exclusion.

Jones (2022) points out that research and assessment tools can be psychometrically valid but be irrelevant for the autistic populations they purport to measure. Tools developed with autistic people to validly measure constructs related to the sociality of autistic children could contribute to testimonial justice, by affording children the credibility to report on their experiences via self-report measures. Such neuro-affirming tools would also be very useful to school psychologists and other professionals who rely on behavioural observations of autistic children to write educational and social skills goals. The goals are usually created using neuro-normative standards and 'deficit-oriented monitoring' (Fisher et al., 2025, p.5), and failure to meet them has the potential to affect autistic children's future educational attainment. Thus, ensuring that the sociality of autistic children is being validly measured also contributes to hermeneutical justice, by giving researchers and educators greater ability to understand the experiences of autistic individuals and fully include them in educational settings.

Limitations of the study

This study had several limitations. First, our sample size was small, with too much missingness to conduct more sophisticated statistical analyses or item-level correlations between similar LSDQ and SCBE items. Additionally, because the LSDQ, SCBE and inCLASS measures used different scales and produced ordinal data, calculating scaled scores was the only option for direct comparison. As the child self-reports were collected via verbal administration of a structured questionnaire, their responses were limited by the specific questions the children were asked and we were not able to capture the children's spontaneous thoughts about their social experiences. Their responses may also have been limited by their receptive language abilities and understanding of the abstract concepts of loneliness and friendship. Also, though we incorporated verbal scale administration modifications for autistic children (see Lewis et al., 2024), some children did not want to participate at one or more time points. Their wishes were honoured, which resulted in a smaller sample size for the LSDQ than for the other measures. Finally, the inclusion of some children who were not diagnosed with autism spectrum disorder, but who were identified by their caregivers and teachers as having characteristics of autism may be viewed as a limitation. At the same time, it also provides a more representative sample, as many children who will later have an autism diagnosis are not yet identified in early elementary grades, especially those from low-income households

or marginalized linguistic or racial identities (van 't Hof et al., 2021). Among this age cohort, these delayed diagnoses disproportionately affect children of colour, those speaking languages other than English, and those from low-income households (Guthrie et al., 2019; Portillo et al., 2026).

CONCLUSION AND DIRECTION FOR FUTURE RESEARCH

In this exploratory study, autistic children consistently reported less loneliness at school than would be suggested by teacher-report and researcher observations and may have been using different criteria than the adults around them to determine their social satisfaction. This suggests that teachers should be educated about autistic children's social styles so they can offer appropriate support in the classroom. Relational observation measures are likely inadequate to capture a child's internal experience in general, but those developed for allistic children are more likely to be inherently biased against autistic children, whose core social communication characteristics differentiate them from their peers. Because autistic individuals have historically been victims of testimonial epistemic injustice (Catala et al., 2021), their voices should be prioritized in studies that inquire about their social connectedness and peer relationships and in the design of new observational measures of autistic sociality.

AUTHOR CONTRIBUTIONS

Katharine O'Brien: Conceptualization; investigation; writing – original draft. **Narmene Hamsho:** Conceptualization; funding acquisition; methodology; investigation; project administration; supervision; writing – review and editing. **Abbey Eisenhower:** Conceptualization; funding acquisition; investigation; methodology; project administration; writing – review and editing; supervision. **Amy Hoffman:** Conceptualization; data curation; investigation; formal analysis; visualization; writing – original draft. **Jan Blacher:** Conceptualization; methodology; investigation; funding acquisition; supervision; project administration; writing – review and editing.

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Research data are not shared.

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IRB approval was obtained at both participating institutions.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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