Review

The Impact of Psychoeducation Interventions on Social Skills in Autistic 5–12-Year-Olds: A Narrative Systematic Review

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Abstract

Little is known about the effectiveness of psychoeducation for autistic children and young people (CYP), though evidence supports this approach in other populations. This is the first systematic review to assess the impact of psychoeducational interventions on autistic CYPs' social, communication and interaction, and to provide recommendations for future intervention development. Eleven studies, including 727 participants, met the inclusion criteria. Findings suggest interventions with psychoeducation can support specific skills such as initiating and maintaining interactions, recognising social cues and navigating peer relationships. However, evidence quality was generally low, and there is limited clarity on what works best, for whom, or over time. Interventions frequently lacked theoretical grounding and long-term follow-up, and often adopted a medical model, overlooking autistic perspectives and priorities. Future research should adopt participatory approaches to ensure diversity, inclusivity and co-production with autistic people. Transparent reporting of participant characteristics and meaningful, neurodiversity-affirming outcome measures are also essential. Interventions may further benefit from incorporating non-autistic peers to promote mutual understanding and acceptance of different, not deficient, social practices between autistic and non-autistic CYP. This review highlights the potential of psychoeducation but underscores the need for more rigorous, inclusive and context-sensitive research to support autistic CYP's wellbeing and social development.

Lay Abstract

We don't know much about how well psychoeducation works for autistic children and young people, even though it has helped other groups. Psychoeducation means learning about autism and developing skills to live well with it. These skills might include understanding autism, finding ways to navigate challenges, and feeling more confident in social situations. This review is the first to explore whether psychoeducation can improve social communication and interaction skills for autistic young people and to suggest how these supports could be improved. We looked at 11 studies with a total of 727 participants. The findings show that psychoeducation can help autistic young people with social skills such as starting and keeping conversations and understanding social cue. However, we don't yet know which methods work best or who benefits most. The evidence is generally low quality, and there isn't enough information about long-term effects. Many interventions focus on 'fixing', rather than recognising that autistic people may simply socialise differently. Future research should involve autistic people in designing studies to include a wide range of experiences. Researchers should clearly describe who is involved and measure outcomes that matter to autistic people. Including non-autistic peers in interventions may also help both groups understand and accept each other's different ways of communicating.

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Background

Over four decades, autism's conceptualisation has evolved (Happe & Frith, 2020). The Diagnostic Statistical Manual 5 (DSM5) defines autism as a lifelong neurodevelopmental condition characterised by challenges in reciprocal social communication, interaction and restricted, repetitive behaviours (American Psychiatric Association, 2000). Critics argue DSM5 criteria favour young boys, neglecting autistic girls' and women's unique challenges and the influence of severity, demographics and individual factors on presentation (Happe & Frith, 2020; National Autistic Society, 2024; National Autistic Society, 2025). In this review, we use the term 'gender' rather than 'sex' to reflect the relevance of gender identity, social roles, and lived experiences in shaping autism presentation and access to support. This choice aligns with intersectionality-informed approaches that recognise how gender diversity intersects with other axes of identity to influence autistic CYP's experiences (Cho et al., 2013; Crenshaw, 1989). Autistic children and young people (CYP) are shown to face challenges with emotional regulation, executive functioning, academic attainment, social interactions, and bullying – especially in girls (Chouinard et al., 2019; Dai et al., 2019). These reduce quality of life (Adams et al., 2019), exacerbated by reduced mental flexibility, the ability to adapt thoughts and behaviours in changing social situations (Scott, 1962), and literal interpretation of abstract language, which can complicate friendships (American Psychiatric Association, 2000).

Debates challenge deficit-based views that frame autism as impairing symptoms (American Psychiatric Association, 2000), with neurodiversity perspectives, attributing challenges to an unaccommodating society and emphasising autistic strengths, which can improve quality of life (Kapp, 2020; Taylor et al., 2023; van Heijst & Geurts, 2015).

Social Skills in Autism: Deficient or Different?

'Social skills' encompass behaviours facilitating positive interactions, including verbal/nonverbal communication like initiating conversations, turn-taking, reading social cues, using body language and perspective-taking (Elliott & Gresham, 1987). However, this term can imply autistic communication as deficient. This review uses 'social skills' pragmatically, recognising autistic individuals communicate differently, not poorly, with skills supporting meaningful social engagement.

Deficit-based approach evidence suggests autistic CYP have impaired social skills and may lack interest in interactions (American Psychiatric Association, 2000). However, many autistic CYP desire interaction but lack confidence and skills (Salah et al., 2023). In response, interventions termed 'psychosocial' support social skills in autistic CYP (Morsa et al., 2022). These include clinic-based groups (Olsson et al., 2017), school-based programmes (de Bruin et al., 2013) and parent-assisted training (Park et al., 2023). However, autistic CYP's limited mental flexibility (Scott, 1962) often hinders skill generalisation (Olsson et al., 2017; Powell et al., 2022).

Other approaches focus on autism education, such as technology-assisted tools including emotion recognition technologies (e.g. facial expression analysis software for emotion identification (Garcia-Garcia et al., 2022), virtual reality platforms that create immersive social scenarios to practice social interactions (Dixon et al., 2020; Liao et al., 2022), and e-coaching via digital devices to support real-time feedback and guidance (Tunc-Paftali & Tekin-Iftar, 2021).

Interventions promoting empathy, peer integration, mental health and wellbeing (Kose et al., 2023) often draw on the Theory of Mind (ToM) hypothesis, suggesting autistic individuals struggle to understand others' emotions (Frith, 1989), although empirical findings remain mixed (Shalev et al., 2022). Emotional empathy (feeling others' emotions) and cognitive empathy (recognising mental states) are often studied separately. For example, autistic children show lower emotional empathy than non-autistic peers (Scambler et al., 2007), but no cognitive empathy differences in adults (Lombardo et al., 2016). These findings challenge the assumption of a distinct cognitive empathy deficit (Shalev et al., 2022).

Such interventions often adopt a deficit-based perspective, framing social and communicative differences as impairments. This view is contested by the Double Empathy Problem, which conceptualises communication challenges as arising from mutual differences in experience and understanding between autistic and non-autistic individuals, rather than from individual deficits (Radley et al., 2020). Consequently, deficit-based models are criticised for presuming incompetence and disempowering autistic individuals (Donaldson et al., 2017).

Peer-mediated training and structured engagement report positive outcomes, including increased social initiations, enhanced reciprocal conversations and improved social cue understanding (McGovern & Sigman, 2005; Radley et al., 2020). These involve guided peer interactions in naturalistic settings, fostering skills like turn-taking and emotional responsiveness. Effective social skills are associated with improved mental health, academic achievement and peer acceptance (Hartup, 1989). However, peer-mediated training and structured peer-engagement programs are

costly, time-limited and require unfamiliar environments, limiting accessibility (Lam et al., 2008; Powell et al., 2022).

Psychoeducation

Psychoeducation definitions range from patient education and problem-solving (Anderson et al., 1980) to promoting self-understanding and skill development (Bai et al., 2015; Ferrin et al., 2014). This review defines it as fostering autism understanding and skills for autistic individuals to thrive (Powell et al., 2022). Evidence supports psychoeducation for social communication and interaction in CYP with mental health conditions (Cummings & Fristad, 2007), Attention Deficit Hyperactivity Disorder (ADHD) (Powell et al., 2021), and autism (Dawson, 1997; Howlin, 2005; Powell et al., 2024; Smith, 1999). A recent scoping review highlights psychoeducation's potential for autistic CYP but notes intervention heterogeneity and research gaps (Morsa et al., 2022). A co-designed, paper-based psychoeducational resource for UK primary-aged autistic CYP in mainstream schools showed promise (Powell et al., 2024), enhancing communication, providing age-appropriate autism knowledge and supporting coping strategies. Families valued its strengths-based approach, and challenge recognition, e.g. by asking grown-ups for help.

Evidence synthesis on psychoeducation for autistic CYP is limited but critical to identify effective approaches and target groups. Therefore, this systematic narrative review aims to assess the effectiveness of interventions with psychoeducation for social skills in autistic 5-12-year-olds. Findings will inform future intervention development, research and contribute to shaping policy and practice through theoretically and practically significant recommendations.

Methods

The systematic review protocol was registered with PROSPERO (CRD42022307971) and followed Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) (Rethlefsen et al., 2013).

Author Positionality

It is important to recognise the positionality of authors. Author LP is a late-diagnosed ADHD and autistic woman; JP identifies as neurodivergent; JS is a clinical professional and EC is diagnosed with obsessive compulsive disorder. Lived experience researchers provide unique and valuable perspectives therefore this author composition is considered a strength to this work.

Search Strategy

Search terms and inclusion criteria were informed by Cochrane literature, information specialist advice and the Cochrane Handbook (Campbell et al., 2020). The Population Intervention Comparison Outcome Study Design (PICOS) framework guided criteria (Richardson et al., 1995). The population is autistic 5–12-year-olds in mainstream education. Interventions target specific social, communication and interaction skills broadly defined to encompass abilities such as initiating and maintaining interactions, recognising social cues, and navigating peer relationships, as reported in the included studies. This broad definition reflects the varied ways social skills are conceptualised in psychoeducational interventions for autistic CYP. Only RCTs with control groups receiving no other interventions were included for clearer effect size comparisons.

Searches covered 2013–2024, post-DSM5 release (Edition, 2013), limited to English due to translation constraints. Databases searched in April 2024 included MEDLINE, APA PsychINFO via Ovid, The Cochrane Library, CINAHL via EBSCO, Web of Science (Core Collection), ProQuest, ASSIA via ProQuest and Scopus, selected for comprehensive coverage across health, psychology, education, and interdisciplinary social sciences. Database search strategies can be found in supplemental material. Medical Subject Headings (MeSH) keywords used were child, students, minors, adolescent, young adult, autism, autistic disorder, autism spectrum disorder, Asperger syndrome, education, schools, knowledge, social skills, communication, empathy, friends, knowledge.

Text terms were 'young people, young person, teenage, student, school age, minor, boy, girl, YP, teen, youth, juvenile, juvenescent, pubescent, ASD, ASC, Autistic spectrum disorder, autistic spectrum condition, Asperger, pervasive developmental disorder, PDD, psychoeducation, train, teach, school, tuition, tutor, coach, guide, instruct, inform, develop, lesson, learn, social skill, social develop, disrupt, peer reject, peer problem, peer interact, peer dysfunction, peer relation, peer function, friendship, know, understand, comprehend, inform'. Terms like 'adolescent' and 'young adult' were included in the initial search to maximise sensitivity and capture a broad range of studies. However, only studies with a mean participant age of 5–12 were included, aligning with the review's focus on middle childhood. Peer interaction terms reflected school-age social contexts, with broader social skills like communication, empathy, and understanding included. Boolean logic ('AND', 'OR') combined terms. MeSH and free-text terms, adapted from prior work (Powell et al., 2021) were reviewed by LP, JP, JS to ensure completeness. No additional study identification methods were used. Search limits included English language, human participants, children under 18, 2013–2024 publications and RCTs. References were managed in Endnote for de-duplication.

Quality Assessment

RCT methodological quality was assessed using the Cochrane Risk of Bias 2 Tool (CRoB2) (Higgins et al., 2019), which

assesses bias in randomisation, intervention deviations, missing data, outcome measurement and result selection. Studies were rated some concerns, low or high risk per CRoB2 algorithms (Richardson et al., 1995). Low risk indicates methodological robustness; high risk suggests validity concerns. LP and JP conducted assessments, resolving disagreements via discussion or adjudication by JS and EC.

Study Selection

LP and JP independently screened titles, abstracts and full texts against inclusion criteria (Table 1). Agreement was reached at each stage, with all authors resolving discrepancies through discussion. Study characteristics (location, participants, intervention, comparator, results) were recorded. LP extracted data, verified by JP, JS and EC.

Data Extraction

Extracted data included author, year, country, study design, sample characteristics (age, gender, ethnicity, how diagnosis confirmed, occurring conditions), recruitment, social skills outcome measures and results.

Data Synthesis

Due to inconsistent outcome measures, meta-analysis was not feasible. Data were narratively synthesised using tables, graphs, and text, focusing on participant characteristics, intervention intensity, duration, content, participant involvement and outcome associations. All authors reviewed the synthesis, resolving discrepancies through discussion.

Results

Summary of Included Studies

The literature search yielded 4,199 records (4,183 after deduplication). No additional citations were identified via reference checks. LP and JP screened 4,183 citations, excluding 3,676 by title and 390 by abstract. Of 117 full texts reviewed, 104 were excluded, leaving 13 papers covering 11 studies.

Exclusion reasons:

- Age outside 5–12 years (n = 55)
- Non-autistic populations (n = 8)
- Not primary research (n = 2)
- Non-RCT (n = 1)
- No clinical autism diagnosis (n = 4)
- Pre-2013 publication (n = 1)
- No psychoeducation (n = 3)
- Unclear (n = 6) or non-mainstream school attendance (n = 8)
- No pure control group (n = 6)

Table 1. Inclusion Exclusion Criteria.

Inclusion Criteria	Exclusion Criteria
Participants	
Clinical autism diagnosis	No autism clinical diagnosis (e.g., waitlist, suspected or self-reported)
Autistic CYP in mainstream education to reflect the majority (Roberts & Webster, 2022)	Attending special education or education not reported
Aged 5–12 years as adolescents have distinct needs (Teliti & Resulaj, 2022)	Under 5 or over 12 years
Intervention	
Aims to benefit autistic 5–12-year-olds	Does not aim to benefit autistic CYP
Includes psychoeducation component – as defined in this review	Psychoeducation not included
Published from 2013 to reflect DSM-5 autism definition	Published before 2013
Outcomes	
Measures social skills	Does not measure social skills in autistic CYP
Study design	
RCT: Highest level of primary research evidence (Weiss et al., 1985)	Not an RCT, or a pilot/feasibility study.
Includes control group receiving only usual care.	Control group receives alternative intervention, potentially confounding results.
Published in English	Not published in English

- Outcomes not measuring social skills (n = 7) or not autistic CYP (n = 2)

Table 2 details screening; supplemental material show PRISMA diagrams per database.

Participant Composition of Included Studies

The 11 studies included 727 autistic CYP were included (mean n = 66), with 619 at follow-up (mean n = 56.3) and

Table 2. Search Results for the Seven Databases Searched.

Database	Results Yielded from Search	Results Following Deduplication	Results Excluded by Title	Results Excluded by Abstract	Full Texts Screened	Full Texts Excluded	Papers Included in Review
Cochrane database	1837	1835	1643	161	31	28	4
CINAHL	269	269	260	6	3	3	0
Medline	295	291	181	70	40	36	4
ASSIA	29	29	29	0	0	0	0
Proquest	245	245	245	0	0	0	0
Scopus	837	836	761	68	7	6	1
Web of Science	394	385	285	68	32	28	4
PsycInfo	293	293	272	17	4	4	0

108 dropouts. Mean age was 8.9 years (range 5–12). Studies spanned 2013–2024. Most participants were male and Caucasian /European/White (Table 3).

All but one study (Koning et al., 2013) included males and females, with 548 males, 78 females and 202 unreported (Figure 1).

Studies were conducted in Hong Kong (Chung et al., 2024), Australia (Beaumont et al., 2021; Kent et al., 2020), USA (Lopata et al., 2019, 2021; Nowell et al., 2019; Shih et al., 2019; Soorya et al., 2015; Thomeer et al., 2019), Netherlands (Begeer et al., 2015) and Canada (Koning et al., 2013). Four studies (264 participants) omitted ethnicity (Begeer et al., 2015; Chung et al., 2024; Kent et al., 2020; Koning et al., 2013). Of 463 with reported ethnicity, 339 (73.2%) were Caucasian/European/White (Figure 2).

Eight studies omitted co-occurring conditions (Chung et al., 2024; Kent et al., 2020; Koning et al., 2013; Lopata et al., 2019; Lopata et al., 2021; Nowell et al., 2019; Shih et al., 2019; Thomeer et al., 2019). One included them without breakdown (Soorya et al., 2015), another reported ADHD (n = 17), ODD (n = 2), OCD (n = 3), anxiety (n = 5), Tourette's (n = 1), depression (n = 2) (Beaumont et al., 2021), and one noted 14% had ADHD, 10% had hyperactivity symptoms, 4% ODD, and 2% Conduct Disorder (Begeer et al., 2015). Table 4 summarises studies.

Intervention Components: Context and Delivery

Interventions, rooted in deficit-based models, aimed to improve social skills, presumed deficient in autistic CYP. All required trained personnel: school staff (Lopata et al., 2019), study team (Shih et al., 2019), clinicians/therapists (Beaumont et al., 2021; Begeer et al., 2015; Chung et al., 2024; Kent et al., 2020; Lopata et al., 2021; Nowell et al., 2019; Soorya et al., 2015; Thomeer et al., 2019), or unspecified "trained individuals" (Koning et al., 2013). Delivery setting included online (Beaumont et al., 2021), in clinics (Kent et al., 2020), schools (Lopata et al., 2019; Shih et al., 2019), local agency (Thomeer et al., 2019) or community education (Chung et al., 2024). Settings were unreported in five studies (Begeer et al., 2015; Kent et al., 2020; Koning et al., 2013; Lopata et al., 2021; Soorya et al., 2015).

Intervention Components: Participating Audiences and Content. Interventions targeted autistic CYP, parents or staff. Examples include Secret Agent Society (Beaumont et al., 2021) which offered therapist-led parent webinars and home tasks to support children's social-emotional skills. Similarly, the Growing, Learning and Living with Autism programme (Nowell et al., 2019) combined parent and child training for social communication and self-regulation. Remaking Recess (Shih et al., 2019) trained staff for peer engagement during recess.

One intervention focussed on didactic play, language and friendship-building by pairing autistic CYP with non-autistic, age- and gender-matched peers (Kent et al., 2020), one trained school staff for peer engagement during unstructured school times (Shih et al., 2019), two targeted autistic CYP, one used CBT-based training to improve social motivation (Koning et al., 2013); and another employed a weekly robot-assisted group to teach two-way communication,

Table 3. Summary of Reported Demographic Information of Participants in Included Studies.

Author, Year, Country	Participant Age Mean	Participant Gender	Participant Ethnicity
Beaumont 2021. Australia	Intervention: 9.8 years (sd 1.57); Control: 9.9 years (sd 1.16). Range 7–10	30 male (86%), 5 female (14%) per group	European/Caucasian: n = 69 Aboriginal; n = 1
Lopata 2021. USA	Intervention: 9.77 (sd 1.76). Control: 9.57 (sd 1.73). Range 7–12	Intervention: 38 (86%) male, 6 (14%) female. Control: 37 (84%) male, 7 (16%) female	Caucasian: 84% treatment, 77% control group. Remaining not reported.
Soorya 2015. USA	Intervention: 10.05; Control: 9.87. Range 8–11	Intervention: 30 (85.7%) male, 5 (14.3%) female. Control: 27 (84.38%) male, 7 (15.62%) female	White: 43% Black 21% Hispanic: 26% Asian 1% Other: 9%.
Begeer 2015. Amsterdam	Intervention: 9.7; Control: 9.5. Range 7–12	Not reported	Not reported
Nowell 2019. USA	Intervention: 6.75; Control: 6.89. Range 6–8	Intervention: 6 male (75%), 2 (25%) female. Control: 8 male (80%), 2 (20%) female	Hispanic: 2 Non-Hispanic: 15
Thomeer 2019. USA	Intervention: 8.74; Control: 9.55. Range 7–12	Intervention: 25 (89.3%) male, 3 (10.7%) female. Control: 23 (79.3%) male, 6 (20.7%) female	Caucasian: 82.5% African American: 3.5% Asian-American: 1.8% Other: 12.3%
Kent 2020; 2021. Australia	Intervention: 8.68; Control: 8.44. Range 6–12	Intervention 30 male, 2 female. Control 27 male, 6 female	Not reported
Koning 2013. Canada	Intervention: 10.99; Control: 11.15; Range 10–12	100% male	Not reported
Lopata 2019; 2024. USA	Intervention: 8.65. Control: 9.01. Range 6–12	Intervention: 47 (90.4%) male, 5 (9.6%) female. Control: 47 (92.2%) male, 4 (7.8%) female	Caucasian: 96.2% intervention, 96.1% control Remaining not reported.
Scih 2019. USA	Intervention: 8.31; Control: 8.66; Range not reported	Intervention: 34 (83%) male, 4 (17%) female; Control: 39 (97.5%) male, 2 (2.5%) female	Caucasian: 23 Hispanic: 11 African/African American: 26 Asian: 9 Other/mixed: 7 Do not wish to disclose: 4
Chung 2024. Hong Kong	Mean 7.7 (sd 1.42) Range 5–11 Group breakdown not reported	54 (90%) male, 6 (10%) female Group breakdown not reported	Not reported

emotion recognition, imitation and reciprocal social interactions (Chung et al., 2024).

Eight interventions involved the child and parent: (1) Two focused on non-verbal communication, emotion recognition, and ToM training with parents engaged in complementary activities to reinforce skills at home (Soorya et al., 2015; Nowell et al., 2019). (2) Targeted social communication, nonliteral language interpretation, facial emotion recognition and interest expansion, incorporating behavioural reinforcement with parents trained to support

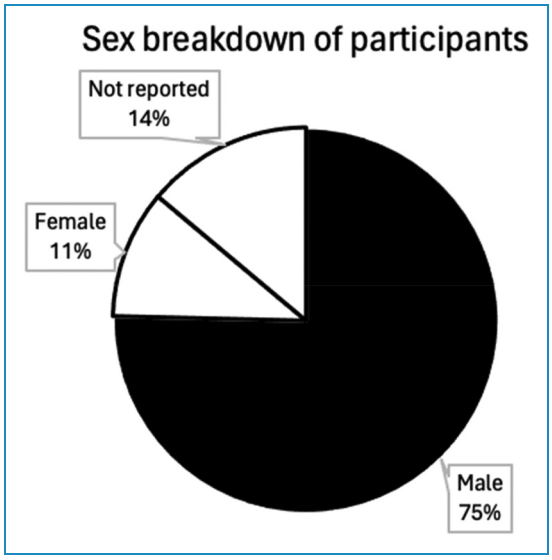

Figure 1. Breakdown of Male and Female Participants Across All Included Studies.

these skills outside of sessions (Thomeer et al., 2019). (3) Addressed social competence through social skills groups, emotion recognition, therapeutic activities and parent training (Lopata et al., 2019), involving parents as active learners and facilitators in everyday environments. (4) Computer game-based social-emotional skills development plus therapist-led parent webinars and home tasks (Beaumont et al., 2021). (5) Focused on social communication, facial emotion recognition, nonliteral language, and interest expansion (Lopata et al., 2021) with parent involvement aimed at generalising learned skills beyond intervention sessions. (6) Focussed ToM skills, including parent-guided activities to reinforce concepts in daily life (Begeer et al., 2015). (7) Focussed on parents observing their childs play in clinic and at home and discussing observations with a therapist (Kent et al., 2020, 2021).

Social Skills Outcomes

All studies reported improved social skills post intervention. Five studies (reported across seven papers) maintained effects at follow-up (Beaumont et al., 2021; Begeer et al., 2015; Kent et al., 2020; Kent et al., 2021; Lopata et al., 2019; Lopata et al., 2021; Lopata et al., 2024) two did not (Shih et al., 2019; Soorya et al., 2015), and four lacked follow-up data (Chung et al., 2024; Koning et al., 2013; Nowell et al., 2019; Thomeer et al., 2019). Follow-up periods ranged from six weeks (Beaumont et al., 2021) to one year (Lopata et al., 2024) (Table 5).

Comparative Intervention Outcomes

Table 6 compares social skills outcomes, highlighting interventions with consistent, sustained improvements in emotion recognition, ToM, and peer engagement, noting follow-up maintenance.

Quality Assessment: Summary

Overall, four studies had some concerns (Lopata et al., 2019; Shih et al., 2019; Soorya et al., 2015; Thomeer et al., 2019), and seven studies were considered high risk (Beaumont et al., 2021; Begeer et al., 2015; Chung et al., 2024; Kent et al., 2020; Koning et al., 2013; Lopata et al., 2021; Nowell et al., 2019) (see Table 5 and supplemental material).

Quality Assessment: Domain 1: Randomisation Process. Six studies were low risk (Beaumont et al., 2021; Begeer et al., 2015; Chung et al., 2024; Kent et al., 2020; Lopata et al., 2021; Nowell et al., 2019), five had some concerns (Koning et al., 2013; Lopata et al., 2019; Shih et al., 2019; Soorya et al., 2015; Thomeer et al., 2019).

Domain 2: Deviations From Intended Intervention. Three studies were low risk (Beaumont et al., 2021; Kent et al., 2020; Lopata et al., 2019) and eight had some concerns (Begeer et al., 2015; Chung et al., 2024; Koning et al., 2013; Lopata et al., 2021; Nowell et al., 2019; Shih et al., 2019; Soorya et al., 2015; Thomeer et al., 2019).

Domain 3: Missing Outcome Data. Nine studies were low risk (Beaumont et al., 2021; Begeer et al., 2015; Kent et al., 2020; Lopata et al., 2019; Lopata et al., 2021; Nowell et al., 2019; Shih et al., 2019; Soorya et al., 2015; Thomeer et al., 2019); two were high risk (Chung et al., 2024; Koning et al., 2013).

Domain 4: Outcome Measurement. Five studies had high risk (Beaumont et al., 2021; Begeer et al., 2015; Kent et al., 2020; Lopata et al., 2021; Nowell et al., 2019); six had low risk (Beaumont et al., 2021; Chung et al., 2024; Kent et al., 2020; Koning et al., 2013; Lopata et al., 2019; Lopata et al., 2021; Shih et al., 2019; Soorya et al., 2015; Thomeer et al., 2019).

Domain 5: Selection of Reported Results. Eight studies had low risk (Beaumont et al., 2021; Chung et al., 2024; Kent et al., 2020; Koning et al., 2013; Lopata et al., 2019; Lopata et al., 2021; Shih et al., 2019; Thomeer et al., 2019), two had some concerns (Begeer et al., 2015; Soorya et al., 2015), one had high risk (Nowell et al., 2019).

Discussion and Implications

Results Summary

This review evaluates social skills interventions incorporating psychoeducation for autistic 5–12-year-olds. All

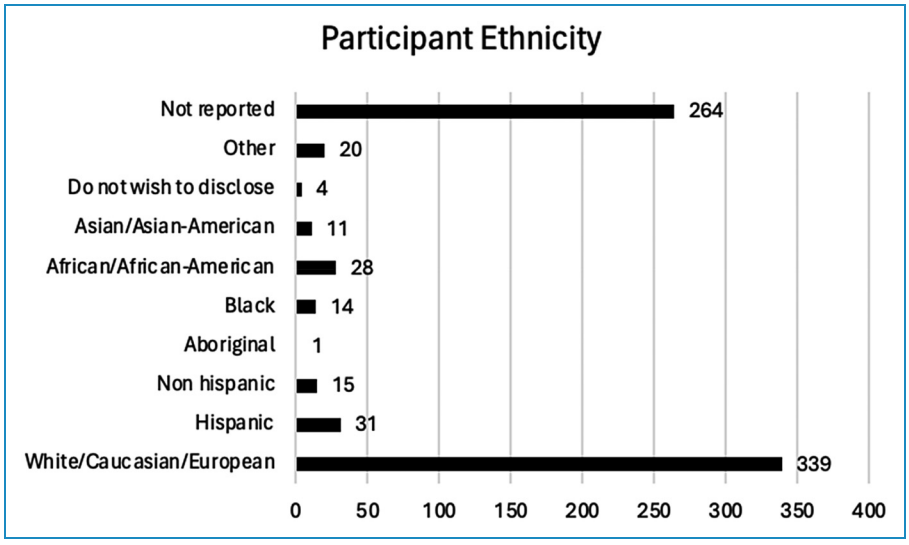

Figure 2. Breakdown of Participant Ethnicity Across Included Studies in This Review.

studies reported statistically significant post-intervention improvements ($p < 0.05$), though follow-up gains varied (Table 3). Participants were predominantly male (75%) and Caucasian (73.2%). Psychoeducation formats differed, engaging parents, school staff, autistic CYP and peers. As the first systematic narrative review focusing on such interventions, it offers guidance for future research, intervention design and support strategies.

Participant Representation

Despite UK calls for inclusive research (Department for Business, Energy and Inditrial Strategy, 2021; Guyan & Oloyede, 2020), ethnic minority groups and autistic girls were underrepresented, limiting conclusions about interventions efficacy for these groups. This highlights the need for broader inclusion to capture varied and distinct social experiences, challenges and strengths that influence how they respond to interventions. Categorising autism as a single condition risks neglecting such marginalised groups (Woods, 2017).

Interventions: From a Deficit to Neurodiversity Approach?

Interventions in this review adopted a deficit-based approach viewing social skills as impaired (Sonuga-Barke, 2023). Critics argue this ignores environment influences (Bertilsdotter Rosqvist et al., 2023; Kapp, 2020), and that framing social interaction as deficient may harm autistic CYP's mental health, fostering shame, low self-esteem and masking, which causes distress and burnout (Bertilsdotter Rosqvist et al., 2023). All included studies were RCTs, a design aligned with medical model assumptions, raising questions about their suitability for neurodiversity-affirming approaches. Neurodiversity-based interventions should validate autistic communication and promote acceptance to foster authentic social development and well-being.

One peer-mediated intervention (PMI) paired autistic CYP with non-autistic age-matched peers to address social skill deficits (Kent et al., 2020; Kent et al., 2021). PMIs have been criticised for their negative impact on non-autistic peers, risking emotional fatigue (Chang & Locke, 2016), yet autistic CYP face greater burnout from societal pressures (Phung et al., 2021). Evidence also shows that non-autistic CYP benefit from regular contact with CYP with disabilities, which can facilitate positive interactions (Reiter & Vitani, 2007). Relatedly, the Double Empathy Theory suggests mutual misunderstandings, not deficits, drive social challenges, urging interventions to foster bidirectional understanding (Milton et al., 2023).

Intervention Context and Delivery

Interventions required sustained attention, often in unfamiliar settings. This can pose several challenges for autistic CYP who may experience attention challenges (van der Meer et al., 2012) and prefer predictability, routine and familiarity (National Autistic Society, 2020). Most interventions required trained professionals, raising suitability concerns post-research funding. The studies included verbally able CYP in mainstream education, necessitating careful consideration of intervention suitability for broader autistic populations. Co-production methods, meaning collaborative development processes involving autistic CYP, their families and professionals, should be used to ensure interventions are accessible, acceptable and relevant to the needs of diverse autistic individuals (Chung et al., 2024).

Table 4. Summary of Included Studies in This Review.

Author, Year, Country, Study Design	Participant Numbers N(n) and Follow Up	Participant Diagnosis'	Intervention Name, Description; Length, Frequency; Who Undertook Intervention; Skills Covered	Control Description	Outcomes and Findings
Beaumont 2021; Australia; RCT	Intervention: 35(25); Control: 35(32); Pre, post, 6-week follow-up	Intervention: 13 ADHD, 1 ODD, 2 Anxiety, 1 Tourette's, 3 Major Depressive Disorder (MDD), 3 coexisting conditions. Control: 4 ADHD, 1 ODD, 3 OCD, 4 Anxiety, 1 MDD. IQ ≥ avg.	Secret Agent Society (SAS): Social-emotional skills via computer game, therapist-led parent webinar, home tasks, 10-week, daily 30-min sessions for child; social-emotional skills	Similar program, no social-emotional component	Significant effects favouring Intervention: SSQ-P ($p = 0.0005$), ERSSQ-P ($p < 0.0005$), SSQ-T ($p = 0.04$), maintained SSQ-P ($p < 0.0005$) ERSSQ-T*
Lopata, 2021; USA; 2 arm-RCT	Intervention: 44(42); Control: 44(41); Pre, post, 4–6-week follow-up	Confirmed autism diagnosis; co-occurring conditions not reported. IQ >70.	Small-group training: Social-communication, emotion recognition, nonliteral language, 18 weeks, 2× 90-min weekly sessions, child; social communication, face emotion recognition, non-literal language skills	Waitlist	Significant effects favour intervention: SRS-2, ASC ($p < 0.001$), maintained at follow-up ($p < 0.001$). BASC-3*; CAM-C*
Soorya 2015; USA; Parallel RCT	Intervention: Int: 35(17); Control: 34(17); Pre, post, 3-month follow-up	Autism (DSM-IV, ADOS, ADI-R). Verbal IQ >70. Co-occurring conditions not reported but considered in analysis. verbal IQ score of > 70	NETT (Nonverbal communication, Emotion recognition, and ToM Training): Nonverbal comm., emotion recognition, ToM training, 5 weeks, 30-min, 2–3x/ week Child including parent activities; Non-verbal communication, emotion recognition skills	Facilitated play, parent support group	GEM/SRS: significant improvements in intervention group, not maintained at follow up. CCC-2*; DANVA2*; RMET*
Begeer, 2015; Netherlands; 2-arm RCT	Intervention: 53(52); Control: 48(45); Pre, post, 6-month follow-up	Autism (DSM-IV). 14% ADHD, 10% hyperactivity, 4% ODD, 2% CD. IQ >70	Mini ToM: Structured therapist-led sessions, 8 weeks, 1hr/week; child; ToM skills	Waitlist	Significant effects favour intervention: SRS-P, ToM test ($p < 0.01$), ToMBC ($p < 0.05$), maintained at follow-up SSQ-P/T*; ToM advanced test*; LEAS-C*
Nowell, 2019; USA, Delayed treatment control RCT	Intervention: 8(7); Control: 10(8); Pre, post, 3 & 6-month follow-ups	Autism (ADOS, clinical interview). Mainstream school	Growing, Learning, and Living with Autism (GoriLLA): Social skills training, 12 weeks, 90-min weekly, parent sessions, Children and parents; Social communication, self-regulation skills	Delayed treatment control	Significant effects favour intervention: COP Social thinking ($p \leq 0.05$), parent detachments ($p \leq 0.04$)

(continued)

Table 4. Continued.

Author, Year, Country, Study Design	Participant Numbers N(n) and Follow Up	Participant Diagnosis'	Intervention Name, Description; Length, Frequency; Who Undertook Intervention; Skills Covered	Control Description	Outcomes and Findings
Thomeer 2019; USA; 2-arm RCT	Intervention: 28(28); Control: 29(29); Pre, post	HFASD, IQ ≥70,	SummerMAX: Social skills, problem-solving, emotion recognition, 5 days a week, 5 weeks; Children and parents; Social communication, non-literal language interpretation, face emotion recognition skills	Waitlist	Significant effects favour intervention: ASC, SRS-2, BASC-2 ($p < 0.001$/ 0.002)
Kent, 2020; Kent 2021; Australia; parallel RCT	Intervention: 32(18); Control: 33(17); Pre, post, 3-month follow-up	Autism, co-occurring permitted, IQ >70, mainstream school Co-occurring conditions not reported.	Ultimate Guide to Play, Language and Friendship: Dyadic play training, video modelling, therapist feedback, 10 weeks, 60-min, Autistic CYP, typically developing age-matched peer; didactic play skills	Delayed treatment control	Significant effects favour intervention: ToP: ($p =$ 0.039), maintained at follow up ($p <$0.001) PRQ*; HCSBS*; SSBS*
Koning, 2013; Canada; 2-arm RCT	Intervention: 8(8); Control: 9(9); Pre, post	Autism, IQ ≥80	Cognitive behaviour therapy-based social skills: Thought-feeling-behaviour link, goal setting, coaching, 15 weeks, 2 h per week; Child; social motivation and initiation, social perception, appropriate social responding skills	No intervention	Significant effects favour intervention: CASP/PIM ($p = 0.003/0.046$) Vineland II*; SRS*
Lopata 2019; Lopata 2024; USA; 2-arm RCT	Intervention: 52(52); Control: 51(50); Pre, post, 6 weeks into/2 weeks before school year end, 6 weeks into next year	Autism, IQ >70,	Comprehensive school-based intervention (CSBI): School-based, social competence training, social skills groups, parent training, 2–3x/week 60–90 min. Children for SSG and parents for parent training; Emotion recognition, social communication skills	Service as usual	Significant effects favour intervention: CAM-C, ASC ($p < 0.001$), maintained SIOS*
Shih, 2019; USA; Multisite 2-arm RCT	Intervention: 40(30); Control: 40(32); Pre, post, 4–6-week follow-up	Autism diagnosis, co-occurring conditions not reported, mainstream classroom ≥51% school day	Remaking Recess: Peer engagement training for school staff, 10 sessions, 20–30 min; School personnel; learn how to facilitate peer engagement	Waitlist	Significant effects favour intervention: POPE ($p =$ 0.049, not maintained), teacher-rated social skills ($p < 0.001$)

(continued)

Table 4. Continued.

Author, Year, Country, Study Design	Participant Numbers N(n) and Follow Up	Participant Diagnosis'	Intervention Name, Description; Length, Frequency; Who Undertook Intervention; Skills Covered	Control Description	Outcomes and Findings
Chung, 2024; Hong Kong 3-arm RCT	Robot: 20; Human: 20; Ctrl: 20; Pre, post	Autism diagnosis, co-occurring not reported.	Robotic intervention programme: Social communication, imitation, structured games, 12 weekly 1:1 sessions, length not reported; child; two-way communication, basic emotions, imitation, reciprocal responses.	No treatment, active comparator (human-led)	Significant effects favour intervention: SRS RSI ($p = 0.001$)

Note. All participants had a confirmed autism diagnosis. ASC: Adapted Skills steaming Checklist; BASC: Behaviour Assessment System for Children; CAM-C: Cambridge Mindreading Face-Voice Battery for Children; CASP: Child and Adolescent Social Perception Measure; CCC-2: Children's Communication Checklist; COP: Child Observation Protocol; DANVA2: Diagnostic Analysis of Nonverbal Accuracy; ERSSQ - P: Emotion Regulation and Social Skills Questionnaire - Parent completed; ERSSQ - T: Emotion Regulation and Social Skills Questionnaire - Teacher completed; GEM: Griffith Empathy Measure; HCSBS: Home and Community Social Behaviour Scales; LEAS-C: Levels of Emotional Awareness Scale for Children; PIM: The Peer Interaction Measure; POPE: The Playground Observation of Peer Engagement; PRQ: Parenting Relationship Questionnaire; RMET: Reading the Mind in the Eyes Test; SIOS: Social Interaction Observation Scale; SRS-2: Social Responsiveness Scale; SRS-P: Social Responsiveness Scale- Parent completed; SSBS: The Schools Social Behaviour Scales; SSQ - P: Social Skills Questionnaire-Parent completed; SSQ - T: Social Skills Questionnaire-Teacher completed; ToMBC: Theory of Mind Behaviour Checklist; ToM: Theory of Mind; ToP: The Test of Playfulness.
*No significant findings.

Intervention Components: What Works?

Successful interventions used engaging, visual activities (e.g. computer games, PMI, robots), accommodating autism's heterogeneity and varied reward preferences (Frober & Dreisbach, 2021). Intensive programs (10–18 weeks) with sustained effects included home activities, weekly goals, and interactive tasks. Findings suggest importance of: (1) support networks, (2) interactive learning, supported by recent systematic review and meta-analysis evidence in ADHD CYP (Powell et al., 2022), and (3) generalisation beyond intervention settings, critical given mental flexibility challenges (Morsa et al., 2022; Scott, 1962). However, intervention heterogeneity prevents definitive conclusions on what drives success.

Parent and Teacher Reported Outcomes

Varied social skills measurements prevented meta-analysis. Teacher and parent reports often diverged, with potential parent bias from intervention investment (Murray et al., 2021). Some studies showed parent-reported gains absent in teacher reports (Begeer et al., 2015; Kent et al., 2021), though three found consistent parent and teacher improvements (Beaumont et al., 2021; Lopata et al., 2024; Thomeer et al., 2019). Balanced reporting is needed to address observer bias.

Strengths and Limitations of This Review and Included Studies

This review is the first to explore the benefits and synthesise evidence of interventions incorporating psychoeducation to support social skills in autistic CYP. If offers unique insights from diverse author experiences (Sonuga-Barke, 2023), and explores the implications of a neurodiversity approach for future intervention development, contributing to important considerations around supporting autistic CYP, ultimately improving their outcomes.

Included studies are not without limitations. All studies followed a medical model of disability, viewing autistic social skills as deficient, not different. Most positioned neurotypical skills as the ideal, reinforcing a socialisation hierarchy (Sharma et al., 2012) and not recognising strengths of autistic CYP (Black et al., 2019; Scott et al., 2019).

Interventions varied in components, intensity and duration, limiting the ability to draw firm conclusions (Morsa et al., 2022). Many did not label their approach as psychoeducation, or include explicit education about autism, despite evidence that understanding one's condition and presuming competence (Donaldson et al., 2017) supports well-being (Powell et al., 2021; Powell et al., 2024). Though co-design with autistic people enhances impact and ethical practice, studies did not adopt participatory methods, including when selecting outcome measures. Most assessed social

Table 5. Cochrane Risk of Bias 2 Judgements Summary.

	Randomisation Process RoB	Deviations From Intended Intervention RoB	Missing Outcome Data RoB	Measurement of Outcome RoB	Selection of Reported Result RoB	Overall RoB
Beaumont, 2021	Low Risk	Low Risk	Low Risk	High Risk	Low Risk	High Risk
Lopata, 2020	Low Risk	Some Concerns	Low Risk	High Risk	Low Risk	High Risk
Soorya, 2015	Some Concerns	Some Concerns	Low Risk	Low Risk	Some Concerns	Some Concerns
Begeer, 2015	Low Risk	Some Concerns	Low Risk	High Risk	Some Concerns	High Risk
Nowell, 2019	Low Risk	Some Concerns	Low Risk	High Risk	High Risk	High Risk
Thomeer, 2019	Some Concerns	Some concerns	Low Risk	Low Risk	Low Risk	Some Concerns
Kent, 2020; 2021	Low Risk	Low Risk	Low Risk	High risk	Low Risk	High Risk
Koning, 2013	Some Concerns	Some Concerns	High Risk	Low Risk	Low Risk	High Risk
Lopata, 2018; 2024	Some Concerns	Low Risk	Low Risk	Low Risk	Low Risk	Some Concerns
Scih, 2019	Some Concerns	Some Concerns	Low Risk	Low Risk	Low Risk	Some Concerns
Yin-han Chung, 2023	Low Risk	Some Concerns	High Risk	Low Risk	Low Risk	High Risk

Table 6. Comparison of Outcomes Across Interventions.

Author (Year)	Intervention Name, Type/Mode	Duration, Frequency	Key Outcomes Measured	Significant Positive Effects	Maintenance at Follow-Up	Notes on Population & Delivery
Beaumont, 2021	Secret Agent Society (SAS); Computer game + therapist-led + parent webinar	10 weeks, daily 30-min child sessions	Social skills (SSQ-P, ERSSQ)	Significant improvements social and emotion regulation skills (SSQ-P, ERSSQ-P, SSQ-T)	Yes, maintained at 6 weeks	Includes children with ADHD, anxiety, ODD; IQ average or above
Lopata, 2021	Small-group training, Group therapy, child-focused	18 weeks, 2 × 90-min weekly	Social communication, emotion recognition, nonliteral language (SRS-2, ASC)	Significant improvements (SRS-2, ASC)	Yes, maintained at 4–6 weeks	Autism diagnosis, IQ > 70
Soorya, 2015	NETT; Nonverbal comm., emotion recognition, ToM training	5 weeks, 2–3x/week 30-min sessions	Nonverbal communication, emotion recognition (GEM/SRS)	Significant improvements post-intervention	No, effects not maintained at 3 months	Autism, verbal IQ >70
Begeer, 2015	Mini ToM; Therapist-led, child-focused	8 weeks, 1 h/week	Theory of Mind (SRS-P, ToM test)	Significant improvements	Yes, maintained at 6 months	Autism, some co-occurring conditions
Nowell, 2019	GoriLLA; Social skills training, parent & child	12 weeks, 90 min weekly	Social communication, self-regulation (COP)	Significant improvements	No data	Autism, mainstream school
Thomeer, 2019	SummerMAX, Social skills, problem-solving, emotion recognition	5 weeks, 5 days/ week	Social communication, emotion recognition (ASC, SRS-2)	Significant improvements	No data	HFASD, IQ ≥70
Kent, 2020; 2021	Ultimate Guide to Play; Dyadic play training, video modelling	10 weeks, 60 min weekly	Play skills, social behaviour (ToP, PRQ)	Significant improvements	Yes, maintained at 3 months	Autism, IQ > 70
Koning, 2013	CBT-based social skills; CBT, child-focused	15 weeks, 2 h/week	Social motivation, perception (CASP/PIM)	Significant improvements	No data	Autism, IQ ≥ 80
Lopata, 2019; 2024	CSBI; School-based social competence training	2–3x/week 60–90 min	Emotion recognition, social skills (CAM-C, ASC)	Significant improvements	Yes, maintained	Autism, IQ > 70
Shih, 2019	Remaking Recess; Peer engagement training for staff	10 sessions, 20–30 min	Peer engagement (POPE), social skills	Significant immediate improvements	No, POPE not maintained	Autism, school setting

(continued)

Table 6. Continued.

Author (Year)	Intervention Name, Type/Mode	Duration, Frequency	Key Outcomes Measured	Significant Positive Effects	Maintenance at Follow-Up	Notes on Population & Delivery
Chung, 2024	Robotic intervention; 1:1 structured games	12 weeks, weekly sessions	Social communication, imitation (SRS RSI)	Significant improvements	No data	Autism, no co-occurring data

skills against normative standards, contradicting calls for mutual understanding of autistic and non-autistic communication (Crompton et al., 2021) and for outcomes that matter to autistic individuals (Benevides & Cassidy, 2020).

Another notable limitation was the reliance on low-quality methodologies, weakening robustness and generalisability. This reduces confidence in intervention effectiveness and risks misdirecting future research and policy. Real-world application could therefore be inefficient or ineffective, highlighting the need for rigorous studies with diverse samples and ecologically valid outcomes. While all studies were RCTs, often viewed as the gold standard, such designs may not suit neurodiversity-affirming approaches. RCTs typically reflect medical model assumptions, which may constrain the development or evaluation of socially grounded lived experience-informed interventions.

Homogeneity and poor reporting of participant characteristics raise concerns around how representative the studies are of broader autistic communities. Further, none of the studies explored whether intervention suitability, uptake or benefits varied by gender – warranting caution in generalising findings. Lastly, future research should also include parent and teacher reported outcomes to address potential observer bias.

Future Research and Intervention Development Recommendations

This review demonstrates promise in psychoeducational approaches to support social skills in autistic 5–12-year-olds. The following recommendations for future intervention development aim to contribute to a research standard where research and interventions are suitable and relevant to autistic CYP:

1. Intersectionality and structural inequalities: To understand the intersectionality of sex, gender, race, socioeconomic status, disability and autism, and enable transparent integration of autistic individuals from diverse groups in intervention design, delivery and research. Recognising intersectionality is crucial because autistic CYP's experiences and needs vary widely across identities and backgrounds, which are shaped by structural inequalities and interlocking systems of power (Cho et al., 2013; Crenshaw, 1989). For example, autistic girls and young women may show social differences differently than boys, and cultural or ethnic backgrounds influence social expectations, stigma and support access. However, these differences are not only individual or cultural but also reflect systemic barriers such as racial discrimination in diagnostic processes, socioeconomic exclusion from services, and ableism within education and healthcare. Without explicit attention to these intersecting systems of oppression, interventions risk being less effective, culturally insensitive or inaccessible. Future intervention development must actively challenge these inequities by prioritising inclusion, detailed demographic reporting, and equity-oriented design. This will allow research to uncover the unique challenges, strengths and barriers faced by marginalised subpopulations, leading to more just, relevant, and effective interventions and policies that reflect the lived realities of the autistic community.
2. Approach: To adopt a neurodiversity approach that recognises challenges and strengths of autistic CYP (Lopez et al., 2018; Seligman & Csikszentmihalyi, 2000).
3. Participatory methods: Co-production with autistic people and their supporters should guide intervention and research design. This means involving autistic individuals as equal partners at all stages, from setting research priorities and designing interventions to selecting outcomes and interpreting findings. Strategies like advisory panels, lived-experience co-researchers and accessible consultation workshops enable meaningful engagement. Offering flexible participation formats, fair compensation and autism-friendly communication support is essential to include and value diverse voices. These practices ensure interventions are relevant, respectful and truly

reflect autistic CYP's lived experiences and needs, enhancing ethical integrity and impact.
4. Personalisation: Interventions must be flexible and tailored to individual needs, considering preferred learning styles and real-world applications.
5. Outcome measures: Standardised, validated measures sensitive to neurodivergent social development are needed and must be carefully selected with individuals with lived experience.

By addressing these areas, future research can move beyond the limitations of current evidence, fostering rigorous, inclusive and impactful interventions that truly support autistic CYP in diverse real-world contexts.

Recommendations for Support Networks

Educators should facilitate structured peer interactions, meaning planned and supervised social activities that support positive engagement and social skill development. For example, guided group games or collaborative classroom tasks with defined roles may benefit autistic CYP's social development (Aldabas, 2020). Educators and parents/carers may also wish to carefully encourage autistic CYP's interactions with age-matched typically developing peers, as evidence suggests these can promote mutual understanding of different social practices and preferences (Milton et al., 2023). Neurodiversity based approaches recognise strengths and challenges experienced by neurodivergent individuals and can improve outcomes and well-being, reinforcing the need for research agendas to prioritise diversity and inclusion (Bertilsdotter Rosqvist et al., 2023; Happe & Frith, 2020; Kapp, 2020). Greater adherence to such agendas (Department for Business, Energy and Inditrial Strategy, 2021; Guyan & Oloyede, 2020) may help embed this more widely in practice.

Conclusions

Findings indicate that interventions with psychoeducation could be beneficial for supporting social communication differences and interaction preferences in autistic CYP. Study quality is limited, sample compositions were homogenous, and questions are raised regarding the deficit-based approach interventions were rooted within. Future research should include autistic individuals who represent diverse groups and be rooted within a neurodiversity approach to recognise differences not deficits, and embrace individual strengths, thus moving away from categorising autism as a singular condition. This must be achieved through participatory methods that work towards support and interventions that are flexible, provide learning opportunities outside intervention setting and tailored to individual needs. Lastly, future intervention development should assume competence and support all CYP to understand communication differences to make a more inclusive and accepting world.

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References

Adams, D., Clark, M., & Keen, D. (2019). Using self-report to explore the relationship between anxiety and quality of life in children on the autism spectrum. *Autism Research*, *12*(10), 1505–1515. https://doi.org/10.1002/aur.2155

Aldabas, R. (2020). Effectiveness of peer-mediated interventions (PMIs) on children with autism spectrum disorder (ASD): A systematic review. *Early Child Development and Care*, *190*(10), 1586–1603. https://doi.org/10.1080/03004430.2019.1580275

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders*. APA.

Anderson, C. M., Hogarty, G. E., & Reiss, D. J. (1980). Family treatment of adult schizophrenic patients: A psycho-educational approach. *Schizophrenia Bulletin*, *6*(3), 490–505. https://doi.org/10.1093/schbul/6.3.490

Bai, G. N., et al. (2015). Effectiveness of a focused, brief psychoeducation program for parents of ADHD children: Improvement of medication adherence and symptoms. *Neuropsychiatr Dis Treat*, *11*, 2721–2735.

Beaumont, R., Walker, H., Weiss, J., & Sofronoff, K. (2021). Randomized controlled trial of a video gaming-based social skills program for children on the autism spectrum. *Journal of Autism and Developmental Disorders*, *51*(10), 3637–3650. https://doi.org/10.1007/s10803-020-04801-z

Begeer, S., Howlin, P., Hoddenbach, E., Clauser, C., Lindauer, R., Clifford, P., Gevers, C., Boer, F., & Koot, H. M. (2015). Effects and moderators of a short theory of mind intervention for children with autism spectrum disorder: A randomized controlled trial. *Autism Research*, *8*(6), 738–748. https://doi.org/10.1002/aur.1489

Benevides, T. W., & Cassidy, S. A. (2020). *Measuring what matters in autism research and practice*. Mary Ann Liebert, Inc.

Bertilsdotter Rosqvist, H., Hultman, L., Österborg Wiklund, S., Nygren, A., Storm, P., & Sandberg, G. (2023). Intensity and variable attention: Counter narrating ADHD, from ADHD deficits to ADHD difference. *The British Journal of Social Work*, *53*(8), 3647–3664. https://doi.org/10.1093/bjsw/bcad138

Black, M. H., Mahdi, S., Milbourn, B., Thompson, C., D'Angelo, A., Ström, E., Falkmer, M., & Falkmer, T. (2019). Perspectives of key stakeholders on employment of autistic adults across the United States, Australia, and Sweden. *Autism Research*, *12*(11), 1648–1662. https://doi.org/10.1002/aur.2167

Campbell, M., McKenzie, J. E., Sowden, A., Katikireddi, S. V., Brennan, S. E., Ellis, S., Hartmann-Boyce, J., Ryan, R., Shepperd, S., Thomas, J., Welch, V., & Thomson, H. (2020). Synthesis without meta-analysis (SWiM) in systematic reviews: Reporting guideline. *BMJ*, *368*, l6890. https://doi.org/10.1136/bmj.l6890

Chang, Y.-C., & Locke, J. (2016). A systematic review of peer-mediated interventions for children with autism spectrum disorder. *Research in Autism spectrum Disorders*, *27*, 1–10. https://doi.org/10.1016/j.rasd.2016.03.010

Cho, S., Crenshaw, K. W., & McCall, L. (2013). Toward a field of intersectionality studies: Theory, applications, and praxis. *Signs: Journal of Women in Culture and Society*, *38*(4), 785–810. https://doi.org/10.1086/669608

Chouinard, B., Gallagher, L., & Kelly, C. (2019). He said, she said: Autism spectrum diagnosis and gender differentially affect relationships between executive functions and social communication. *Autism*, *23*(7), 1793–1804. https://doi.org/10.1177/1362361318815639

Chung, E. Y., Kuen-Fung Sin, K., & Chow, D. H. (2025). Effectiveness of robotic intervention on improving social development and participation of children with autism Spectrum disorder - A randomised controlled trial. *Journal of Autism and Developmental Disorders*, *55*, 1–8.

Crenshaw, K. (1989). *Demarginalizing the intersection of race and sex: A African American feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics*. University of Chicago Legal Forum.

Crompton, C. J., DeBrabander, K., Heasman, B., Milton, D., & Sasson, N. J. (2021). Double empathy: Why autistic people are often misunderstood. *Frontiers for Young Minds*, *9*, 554875. https://doi.org/10.3389/frym.2021.554875

Cummings, C. M., & Fristad, M. A. (2007). Medications prescribed for children with mood disorders: Effects of a family-based psychoeducation program. *Experimental and Clinical Psychopharmacology*, *15*(6), 555–562. https://doi.org/10.1037/1064-1297.15.6.555

Dai, M., Lin, L., Liang, J., Wang, Z., & Jing, J. (2019). Gender difference in the association between executive function and autistic traits in typically developing children. *Journal of Autism and Developmental Disorders*, *49*, 1182–1192. https://doi.org/10.1007/s10803-018-3813-5

Dawson, G. (1997). Early intervention in autism. *The Effectiveness of Early Intervention*, *38*(2), 179–186.

de Bruin, C. L., Deppeler, J. M., Moore, D. W., & Diamond, N. T. (2013). Public school-based interventions for adolescents and young adults with an autism Spectrum disorder. *Review of Educational Research*, *83*(4), 521–550. https://doi.org/10.3102/0034654313498621

Department for Business, Energy, and Inditrial Strategy. (2021). R&D People and Culture Strategy: People at the heart of R&D [27.09.2024]; Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004685/r_d-people-culture-strategy.pdf.

Dixon, D. R., Miyake, C. J., Nohelty, K., Novack, M. N., & Granpeesheh, D. (2020). Evaluation of an immersive virtual reality safety training used to teach pedestrian skills to children with autism spectrum disorder. *Behavior Analysis in Practice*, *13*(3), 631–640. https://doi.org/10.1007/s40617-019-00401-1

Donaldson, A. L., Krejcha, K., & McMillin, A. (2017). A strengths-based approach to autism: Neurodiversity and partnering with the autism community. *Perspectives of the ASHA Special Interest Groups*, *2*(1), 56–68. https://doi.org/10.1044/persp2.SIG1.56

Edition, F. (2013). Diagnostic and statistical manual of mental disorders. *American Psychiatric Association*, *21*(21), 591–643.

Elliott, S. N., & Gresham, F. M. (1987). Children's social skills: Assessment and classification practices. *Journal of Counseling & Development*, *66*(2), 96–99. https://doi.org/10.1002/j.1556-6676.1987.tb00808.x

Ferrin, M., Moreno-Granados, J. M., Salcedo-Marin, M. D., Ruiz-Veguilla, M., Perez-Ayala, V., & Taylor, E. (2014). Evaluation of a psychoeducation programme for parents of children and adolescents with ADHD: Immediate and long-term effects using a blind randomized controlled trial. *European Child & Adolescent Psychiatry*, *23*(8), 637–647. https://doi.org/10.1007/s00787-013-0494-7

Frith, U. (1989). Autism and "theory of mind". In *Diagnosis and treatment of autism* (pp. 33–52). Springer.

Frober, K., & Dreisbach, G. (2021). How sequentially changing reward prospect modulates meta-control: Increasing reward prospect promotes cognitive flexibility. *Cognitive, Affective, & Behavioral Neuroscience*, *21*(3), 534–548. https://doi.org/10.3758/s13415-020-00825-1

Garcia-Garcia, J. M., Penichet, V. M. R., Lozano, M. D., & Fernando, A. (2022). Using emotion recognition technologies to teach children with autism spectrum disorder how to identify and express emotions. *Universal Access in the Information Society*, *21*(4), 809–825. https://doi.org/10.1007/s10209-021-00818-y

Guyan, K., & Oloyede, F. (2020). *Equality, diversity and inclusion in research and innovation: UK review*. UK Research and Innovation.

Happe, F., & Frith, U. (2020). Annual research review: Looking back to look forward - changes in the concept of autism and implications for future research. *Journal of Child Psychology and Psychiatry*, *61*(3), 218–232. https://doi.org/10.1111/jcpp.13176

Hartup, W. W. (1989). Social relationships and their developmental significance. *American Psychologist*, *44*(2), 120–126. https://doi.org/10.1037/0003-066X.44.2.120

Higgins, J. P. T., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J., & Welch, V. A. (2019). *Cochrane Handbook for Systematic Reviews of Interventions* (2nd ed.). Chichester, UK: John Wiley & Sons.

Howlin, P. (2005). The effectiveness of interventions for children with autism. *Journal of Neural Transmission. Supplementum*, *69*, 101–119. https://doi.org/10.1007/3-211-31222-6_6

Kapp, S. K. (2020). *Autistic community and the neurodiversity movement: Stories from the frontline*. Springer Nature.

Kent, C., Cordier, R., Joosten, A., Wilkes-Gillan, S., & Bundy, A. (2020). Can we play together? A closer look at the peers of a peer-mediated intervention to improve play in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *50*, 2860–2873. https://doi.org/10.1007/s10803-020-04387-6

Kent, C., Cordier, R., Joosten, A., Wilkes-Gillan, S., & Bundy, A. (2021). Can I learn to play? Randomized control trial to assess effectiveness of a peer-mediated intervention to improve play in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *51*(6), 1823–1838. https://doi.org/10.1007/s10803-020-04671-5

Koning, C., Magill-Evans, J., Volden, J., & Dick, B. (2013). Efficacy of cognitive behavior therapy-based social skills intervention for school-aged boys with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *7*(10), 1282–1290. https://doi.org/10.1016/j.rasd.2011.07.011

Kose, S., et al. (2023). The relationship between social skills and sensory profile, emotion regulation, and empathizing/systemizing in adolescents on the autism spectrum. *Journal of Autism and Developmental Disorders*, *55*(1), 1–17. https://doi.org/10.1007/s10803-023-06190-5

Lam, K. S., Bodfish, J. W., & Piven, J. (2008). Evidence for three subtypes of repetitive behavior in autism that differ in familiality and association with other symptoms. *Journal of Child Psychology and Psychiatry*, *49*(11), 1193–1200. https://doi.org/10.1111/j.1469-7610.2008.01944.x

Liao, C.-Y., Ganz, J. B., Wattanawongwan, S., Haas, A. N., Ura, S. K., Vannest, K. J., & Morin, K. L. (2022). Parent coaching in a multimodal communication intervention for children with autism. *Focus on Autism and Other Developmental Disabilities*, *37*(3), 158–168. https://doi.org/10.1177/10883576221099896

Lombardo, M. V., Lai, M.-C., Auyeung, B., Holt, R. J., Allison, C., Smith, P., Chakrabarti, B., Ruigrok, A. N. V., Suckling, J., Bullmore, E. T., Bailey, A. J., Baron-Cohen, S., Bolton, P. F., Bullmore, E. T., Carrington, S., Catani, M., & Chakrabarti, B. (2016). Unsupervised data-driven stratification of mentalizing heterogeneity in autism. *Scientific Reports*, *6*(1), 35333. https://doi.org/10.1038/srep35333

Lopata, C., et al. (2024). Longitudinal follow-up study of social intervention outcomes for children on the autism Spectrum. *Journal of Autism and Developmental Disorders*, *55*, 1–15. https://doi.org/10.1007/s10803-023-06221-1

Lopata, C., Thomeer, M. L., Rodgers, J. D., Donnelly, J. P., & Booth, A. J. (2021). RCT Of a comprehensive outpatient treatment for children with autism Spectrum disorder. *Journal of Clinical Child & Adolescent Psychology*, *50*(6), 796–810. https://doi.org/10.1080/15374416.2020.1790380

Lopata, C., Thomeer, M. L., Rodgers, J. D., Donnelly, J. P., McDonald, C. A., Volker, M. A., Smith, T. H., & Wang, H. (2019). Cluster randomized trial of a school intervention for children with autism spectrum disorder. *Journal of Clinical Child & Adolescent Psychology*, *48*(6), 922–933. https://doi.org/10.1080/15374416.2018.1520121

Lopez, S. J., Pedrotti, J. T., & Snyder, C. R. (2018). *Positive psychology: The scientific and practical explorations of human strengths*. Sage Publications.

McGovern, C. W., & Sigman, M. (2005). Continuity and change from early childhood to adolescence in autism. *Journal of Child Psychology and Psychiatry*, *46*(4), 401–408. https://doi.org/10.1111/j.1469-7610.2004.00361.x

Milton, D. E., Waldock, K. E., & Keates, N. (2023). Autism and the 'double empathy problem'. *Conversations on Empathy: Interdisciplinary Perspectives on Empathy, Imagination and Othering*, 78–97.

Morsa, M., De Andrade, V., Alcaraz, C., De La Tribonnière, X., Rattaz, C., & Baghdadli, A. (2022). A scoping review of education and training interventions in autism spectrum disorder. *Patient Education and Counseling*, *105*(9), 2850–2859. https://doi.org/10.1016/j.pec.2022.05.012

Murray, A. L., Speyer, L. G., Hall, H. A., Valdebenito, S., & Hughes, C. (2021). Teacher versus parent informant measurement invariance of the strengths and difficulties questionnaire. *Journal of Pediatric Psychology*, *46*(10), 1249–1257. https://doi.org/10.1093/jpepsy/jsab062

National Autistic Society. (2020). Dealing with change - a guide for all audiences. [27.09.2024]; Available from: https://www.autism.org.uk/advice-and-guidance/topics/behaviour/dealing-with-change/all-audiences.

National Autistic Society. (2024). Autism assessment waiting times. [03.01.2025]; Available from: https://www.autism.org.uk/what-we-do/news/autism-assessment-waiting-times-7.

National Autistic Society. (2025). LGBTQ+ online branch. [06.01.2025]; Available from: https://www.autism.org.uk/what-we-do/branches/lgbtq-online-branch.

Nowell, S. W., Watson, L. R., Boyd, B., & Klinger, L. G. (2019). Efficacy study of a social communication and self-regulation intervention for school-age children with autism Spectrum disorder: A randomized controlled trial. *Language, Speech, and Hearing Services in Schools*, *50*(3), 416–433. https://doi.org/10.1044/2019_LSHSS-18-0093

Olsson, N. C., Choque Olsson, N., Flygare, O., Coco, C., Görling, A., Råde, A., Chen, Q., Lindstedt, K., Berggren, S., Serlachius, E., Jonsson, U., Tammimies, K., Kjellin, L., & Bölte, S. (2017). Social skills training for children and adolescents with autism spectrum disorder: A randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, *56*(7), 585–592. https://doi.org/10.1016/j.jaac.2017.05.001

Park, M. N., Moulton, E. E., & Laugeson, E. A. (2023). Parent-assisted social skills training for children with autism

spectrum disorder: PEERS for preschoolers. *Focus on Autism and Other Developmental Disabilities*, *38*(2), 80–89. https://doi.org/10.1177/10883576221110158

Phung, J., Penner, M., Pirlot, C., & Welch, C. (2021). What I wish you knew: Insights on burnout, inertia, meltdown, and shutdown from autistic youth. *Frontiers in Psychology*, *12*, 741421. https://doi.org/10.3389/fpsyg.2021.741421

Powell, L. A., Parker, J., Weighall, A., & Harpin, V. (2022). Psychoeducation intervention effectiveness to improve social skills in young people with ADHD: A meta-analysis. *Journal of Attention Disorders*, *26*(3), 340–357. https://doi.org/10.1177/1087054721997553

Powell, L., Wheeler, G., Redford, C., & Parker, J. (2021). The suitability and acceptability of a co-designed prototype psychoeducational activity book for seven- to eleven-year-olds with ADHD. *Design for Health*, *5*(1), 4–25. https://doi.org/10.1080/24735132.2021.1928380

Powell, L., Wheeler, G., Redford, C., & Stott, J. (2024). The suitability and acceptability of a co-designed prototype psychoeducational activity book for autistic children aged five-eleven years. *Autism & Developmental Language Impairments*, *9*, 23969415241234648. https://doi.org/10.1177/23969415241234648

Radley, K. C., Dart, E. H., Brennan, K. J., Helbig, K. A., Lehman, E. L., Silberman, M., & Mendanhall, K. (2020). Social skills teaching for individuals with autism spectrum disorder: A systematic review. *Advances in Neurodevelopmental Disorders*, *4*, 215–226. https://doi.org/10.1007/s41252-020-00170-x

Reiter, S., & Vitani, T. (2007). Inclusion of pupils with autism. *Autism*, *11*(4), 321–333. https://doi.org/10.1177/1362361307078130

Rethlefsen, M. L., Mls, K. J., & Kirtley, S. (2013). PRISMA-search (PRISMA-S) extension to PRISMA development protocol.

Richardson, W. S., et al. (1995). The well-built clinical question: A key to evidence-based decisions. *ACP Journal Club*, *123*(3), A12–A13. https://doi.org/10.7326/ACPJC-1995-123-3-A12

Roberts, J., & Webster, A. (2022). Including students with autism in schools: A whole school approach to improve outcomes for students with autism. *International Journal of Inclusive Education*, *26*(7), 701–718. https://doi.org/10.1080/13603116.2020.1712622

Salah, B., et al. (2023). Guidance for autistic children in increasing confidence in socializing. *Information Sciences Letters*, *12*(2), 807–812. https://doi.org/10.18576/isl/120222

Scambler, D. J., Hepburn, S., Rutherford, M. D., Wehner, E. A., & Rogers, S. J. (2007). Emotional responsivity in children with autism, children with other developmental disabilities, and children with typical development. *Journal of Autism and Developmental Disorders*, *37*(3), 553–563. https://doi.org/10.1007/s10803-006-0186-y

Scott, W. A. (1962). Cognitive complexity and cognitive flexibility. *Sociometry*, *25*(4), 405–414. https://doi.org/10.2307/2785779

Scott, M., Milbourn, B., Falkmer, M., Black, M., Bölte, S., Halladay, A., Lerner, M., Taylor, J. L., & Girdler, S. (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, *23*(4), 869–901. https://doi.org/10.1177/1362361318787789

Seligman, M. E., & Csikszentmihalyi, M. (2000). *Positive psychology: An introduction. Vol. 55*. American Psychological Association.

Shalev, I., Warrier, V., Greenberg, D. M., Smith, P., Allison, C., Baron-Cohen, S., Eran, A., & Uzefovsky, F. (2022). Reexamining empathy in autism: Empathic disequilibrium as a novel predictor of autism diagnosis and autistic traits. *Autism Research*, *15*(10), 1917–1928. https://doi.org/10.1002/aur.2794

Sharma, U., Loreman, T., & Forlin, C. (2012). Measuring teacher efficacy to implement inclusive practices. *Journal of Research in Special Educational Needs*, *12*(1), 12–21. https://doi.org/10.1111/j.1471-3802.2011.01200.x

Shih, W., Dean, M., Kretzmann, M., Locke, J., Senturk, D., Mandell, D. S., Smith, T., & Kasari, C. (2019). Remaking recess intervention for improving peer interactions at school for children with autism spectrum disorder: Multisite randomized trial. *School Psychology Review*, *48*(2), 133–144. https://doi.org/10.17105/SPR-2017-0113.V48-2

Smith, T. (1999). Outcome of early intervention for children with autism. *Clinical Psychology: Science and Practice*, *6*(1), 33. https://doi.org/10.1093/clipsy.6.1.33

Sonuga-Barke, E. J. (2023). *Paradigm 'flipping' to reinvigorate translational science: Outlining a neurodevelopmental science framework from a 'neurodiversity' perspective*. Wiley Online Library.

Soorya, L. V., Siper, P. M., Beck, T., Soffes, S., Halpern, D., Gorenstein, M., Kolevzon, A., Buxbaum, J., & Wang, A. T. (2015). Randomized comparative trial of a social cognitive skills group for children with autism spectrum disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, *54*(3), 208–216.e1. https://doi.org/10.1016/j.jaac.2014.12.005

Taylor, E. C., Livingston, L. A., Clutterbuck, R. A., Callan, M. J., & Shah, P. (2023). Psychological strengths and well-being: Strengths use predicts quality of life, well-being and mental health in autism. *Autism*, *27*(6), 1826–1839. https://doi.org/10.1177/13623613221146440

Teliti, A., & Resulaj, L. (2022). Adolescence in autism spectrum disorder and challenges encountered. *Interdisciplinary Journal of Research and Development*, *9*(1), 42–42. https://doi.org/10.56345/ijrdv9n105

Thomeer, M. L., Lopata, C., Donnelly, J. P., Booth, A., Shanahan, A., Federiconi, V., McDonald, C. A., & Rodgers, J. D. (2019). Community effectiveness RCT of a comprehensive psychosocial treatment for high-functioning children with ASD. *Journal of Clinical Child & Adolescent Psychology*, *48*(sup1), S119–S130. https://doi.org/10.1080/15374416.2016.1247359

Tunc-Paftali, A., & Tekin-Iftar, E. (2021). E-coaching preschool teachers to use simultaneous prompting to teach children with autism spectrum disorder. *Teacher Education and*

Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children, *44*(3), 255–273. https://doi.org/10.1177/0888406420925014

van der Meer, J. M., Oerlemans, A. M., van Steijn, D. J., Lappenschaar, M. G. A., de Sonneville, L. M. J., Buitelaar, J. K., & Rommelse, N. N. J. (2012). Are autism spectrum disorder and attention-deficit/hyperactivity disorder different manifestations of one overarching disorder? Cognitive and symptom evidence from a clinical and population-based sample. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*(11), 1160–1172.e3. https://doi.org/10.1016/j.jaac.2012.08.024

van Heijst, B. F., & Geurts, H. M. (2015). Quality of life in autism across the lifespan: A meta-analysis. *Autism*, *19*(2), 158–167. https://doi.org/10.1177/1362361313517053

Weiss, G., Hechtman, L., Milroy, T., & Perlman, T. (1985). Psychiatric status of hyperactives as adults: A controlled prospective 15-year follow-up of 63 hyperactive children. *Journal of the American Academy of Child Psychiatry*, *24*(2), 211–220. https://doi.org/10.1016/S0002-7138(09)60450-7

Woods, R. (2017). Exploring how the social model of disability can be re-invigorated for autism: In response to Jonathan Levitt. *Disability & Society*, *32*(7), 1090–1095. https://doi.org/10.1080/09687599.2017.1328157