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Supporting children's social play with peer-based intervention and instruction in four inclusive Swedish preschools

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This multiple case study investigated a peer-based intervention and instruction (PBII) for social play, Play Time/Social Time (PT/ST), in four inclusive Swedish preschools. PT/ST contains 28 learning activities where children playfully practice six social skills with significance for social play and friendships. One teacher in each preschool was trained and instructed to implement PT/ST, two with coaching early in the implementation, and two without. At each preschool, one child with special educational needs (SEN) in social play ($n = 4$) and one or two socially skilled peers ($n = 6$) participated. The study aimed to explore how the teachers perceived the influence of PT/ST on social engagement and social play skills in the children with SEN, with/without coaching, and if PT/ST supported social play between the children with and without SEN. It also aimed to examine the feasibility of PT/ST and the influence on preschool inclusion quality in the preschools, with/without coaching. Observational assessments and video observations were used. The results indicate that PT/ST was beneficial for the children with SEN to engage in social play with peers and practice social skills, and for the preschool's inclusion quality regarding involvement in peer interactions and guidance in play, both with/without coaching for the teachers. However, the coaching strengthened the intervention fidelity. Social play occurred between the children with and without SEN in activities where they seemed similarly attracted by the toys and play materials and when they all could engage in the play goals, tasks, and roles. For this, they sometimes needed instructions and encouragement from the teachers.

KEYWORDS

social play, preschool instruction, preschool intervention, inclusion, peer-based, social skills

Introduction

For preschool children, playing with peers is crucial. Both because play in its own right gives children joy and wellbeing (Seland et al., 2015; Lundqvist, 2016) and because it contributes to children's learning, development, and social participation (OECD, 2015; Joseph et al., 2016). Social play between children may also give children opportunities to establish friendships, including social and emotional experiences of intimacy and positive emotions, but also competition and conflict (Maguire and Dunn, 1997; Dunn and Cutting, 1999; Kochenderfer-Ladd and Ladd, 2019). With increasing age, children's social play usually becomes more collaborative and based on pretending in the form of dramatic role-plays (Bodrova, 2008). It will thus also require increasingly complex social skills in the child (Garvey, 1990; Vig, 2007; Movahedazarhouli, 2018), such as persisting when the peer does not respond to a social invitation or play idea, accepting non-responsiveness, or taking new initiatives that contribute to the shared play rhythm (Odom et al., 1997). Based on a classical taxonomy for participation in social play developed by Parten (1932) and still applied in research, policy, and teaching (World Health Organization [WHO], 2007; Barton, 2016; Johnson et al., 2019), children develop from the early forms of social play; solitary play, onlooker, and parallel play, to the more mature associative and cooperative play. This development occurs in an interplay between social, cognitive, and communicative processes and in children's interactions with others (Williams et al., 2000), for which their engagement is a crucial mediating factor (De Kruif and McWilliam, 1999; Coolahan et al., 2000; Sjöman et al., 2016). Thereby, access to relationship quality with both adults and children matters for children's participation in social play and their learning of social skills (Soukakou, 2016; Kesäläinen et al., 2022). For play to be an opportunity for learning and participation for all children, adults may also need to get involved in children's play by utilizing and enriching the children's play ideas and actions (Boat et al., 2010; Johnson et al., 2019). For example, Raspa et al. (2001) found that preschool teachers with warm and affective interaction styles, who used many elaborations, i.e., instructing/informing children to expand their engagement, had more children involved in pretending, persisting, and talking in their classrooms.

The complexity of social play emerges in the sociodramatic, cooperative pretend play for which children use negotiations to interact and experience togetherness (Janson, 2001; Barton, 2016). In these negotiations, the children try to agree on common play goals and argue for and convince each other of appropriate roles and tasks, which can change during the play. They occur in three different but related contexts, which often extend over time: the physical context of space, people, and objects; the social context of communicative exchange; the symbolic context of transforming people, objects, and actions (Janson, 2001; Bodrova, 2008). Cooperative play does not

necessarily mean that all children who play together experience all these contexts in the same way but presupposes that they all engage in the play based on the negotiated goals, roles, and tasks.

Regarding inclusion, international education policy has shifted to emphasize a welcoming, creative and supportive learning community where every child is valued (European Agency for Special Needs and Inclusive Education [EASNIE], 2017), rather than emphasizing learning environments based on children's various disabilities (United Nations, 2006, 2015). Belonging, engagement, and learning for all children thus constitute both means and goals for high-quality inclusive early childhood education (ECE) (European Agency for Special Needs and Inclusive Education [EASNIE], 2017). With this perspective, the opportunities for children to participate in play with peers in preschool will depend on the availability of positive relationships based on their different personalities, interests, perceptions, experiences, social skills, and social play behaviors, and the guidance they may need to play together (Johnson et al., 2019).

For some children, disability, and/or, a non-adapted learning environment, can counteract participation in social play with peers. For example, some children with a disability may be less likely to engage in social play and to express their experiences while playing. They may thus also miss opportunities to learn and use more complex social play behaviors that lead to mutual exchange and communication with peers with typical development (TD) (Odom et al., 2006; Lifter et al., 2011; Barton, 2016). This could be the case, for example, for children with autism spectrum disorder (ASD) (Adler et al., 2014; Erickson et al., 2014) and intellectual disability (ID) (Guralnick et al., 2009), for whom there are often challenges in reciprocal social interaction and communication. A Swedish study showed that even though preschool children with ID were involved in the same kind of play situations and used the same toys as peers with TD, their play was less social and cooperative (Luttropp and Granlund, 2010). This study also showed that the teachers decided the interactions more often for children with ID than for children with TD and that they were more often physically closer to children with ID. In contrast, a study by Skogman (2004) showed that staff in Swedish preschools sometimes tended to take a more passive approach, especially in children's free play. This sometimes led to more moments of loneliness for children with disabilities, as compared to their TD peers. A disability such as ADHD, which involves difficulties with attention, hyperactivity, and impulsivity [American Psychiatric Association [APA], 2013], can also pose challenges to children's participation in social play with peers (Sjöman et al., 2016).

Furthermore, a Swedish review of research and reports on play for children with disabilities also shows the importance of the physical environment to enable play (Westling Allodi et al., 2019). For example, play materials or surfaces are not always physically accessible to all children. In addition, too much play material and unspecified play surfaces can

make it difficult for some children to concentrate on a play activity. However, not only children with disabilities may have difficulty participating in social play. In a large study sample of Swedish preschools including about 9,100 children, children with disabilities accounted for about 4% and children with other special educational needs (SEN) for about 14%. According to the preschool staff, about 55% of the children with disabilities and about 60% of the children with other SEN had difficulties in social play (Lillvist and Granlund, 2010).

Peer-Based Intervention and Instructions (PBIs) are complementary teaching methods supported in systematic research reviews for inclusive ECE (Division for Early Childhood, 2014; Wong et al., 2015; Hume et al., 2021). These are based on the premise that children learn social skills and adaptive behaviors in interaction with other children and with the guidance of adults (Guralnick, 1990). Although PBIs aim at children perceived to need to develop social skills, these can also stimulate social learning for the more socially competent peers who are their interaction partners (Odom et al., 1985; Carter et al., 2008). Play time/social time (PT/ST) is a PBI aiming to promote social play and social skills acquisition for preschool children (Odom et al., 1997). PT/ST provides social skills lessons and social play activities and includes various evidence-based strategies. These are *modeling* (demonstrating and encouraging children to use social skills with peers), *prompting* (supporting children verbally or with gestures and physical guidance to develop goal skills), and *feedback* (giving children responses to increase the likelihood of children using social skills, i.e., not just praising) (Wong et al., 2015; Hume et al., 2021).

Initially, researchers developed PT/ST based on extensive observations of activities in preschools that supported interactions between children (Odom et al., 1990) and in collaboration with teachers (Odom et al., 1993), which in turn generated information for interventions that researchers tested with single-subject design in preschool environments (McConnell et al., 1991; Odom et al., 1992). Several research groups have since tested the effectiveness of PT/ST. In a treatment comparison study, Odom et al. (1999) examined the effects of interventions for promoting the social skills of children with disabilities. The study had five intervention conditions and included TD peers in the play activities: environmental arrangements (EA), child-specific (CS), peer-mediated (PM), comprehensive (where features from the previous three were combined), and a control (no intervention) condition. The result shows positive effects for the children with disabilities, especially for the EA, CS, and PM conditions regarding the frequency of social interaction, whereas the CS and PM conditions had the greatest impact on the quality of interaction and teachers' ratings of social competence, and the EA condition on peer ratings. Moreover, three Polish studies, including children with ASD, ID, motor and sensory disabilities, low social skills, and TD, tested the overall effects of PT/ST (Szumski et al., 2016, 2019; Smogorzewska and Szumski, 2018).

These studies showed that PT/ST improved the children's social skills and ability to understand other people's thoughts and feelings (i.e., the theory of mind). Children with low social skills improved most, even though all children benefited from PT/ST, including their TD peers.

The study context

Swedish preschools enroll about 95% of all children aged 3–5 years (Swedish National Agency for Education [SNAE], 2021). The preschool settings vary in size (children, staff, and units/classes) and organizations (municipal, independent, or parent cooperatives). In addition to the national compulsory curriculum, preschools can add pedagogical orientations such as Reggio Emilia, Waldorf, or Outdoor (Swedish National Agency for Education [SNAE], 2022). Preschool staff includes teachers with university education (about 43%), childcare workers with upper secondary education (about 17%), and staff without pedagogical education (about 40%) (Swedish National Agency for Education [SNAE], 2021). Although not required by the legislation as in school (SFS, 2010/800), many Swedish preschools have access to special educators for supervision (Swedish National Agency for Education [SNAE], 2004). Usually, they have assignments in several settings for the preschool organizer, the municipality, or the county councils. According to the compulsory national curriculum (Swedish National Agency for Education [SNAE], 2011, 2018) and the Education Act (SFS, 2010/800), the preschool staff should adapt the education to each child and pay special attention to children who need more guidance and support. In Sweden, the access to inclusive preschools for young children is thus high. The preschool curriculum also emphasizes the importance of play and social interactions with peers for children's development and learning (Swedish National Agency for Education [SNAE], 2011, 2018). By tradition and supported by the curriculum, children in Swedish preschools have higher access to free play and self-chosen activities than teacher-instructed activities (Coelho et al., 2021). Previous studies have pointed to the challenge for the preschool staff to combine free playing, child agency, teaching, and care to ensure play participation and social learning for all children (Åström et al., 2022), not least when it comes to children with SEN. Investigating PT/ST can contribute knowledge about how inclusive preschools can proactively support children's social play and promote their social skills development.

Aims

In this multiple case study, four teachers at four inclusive preschools implemented PT/ST with a two-model design. Two of the teachers received training in the program,

implementation instructions, and a manual for lessons and play activities. The other two teachers received the same training, instructions, and manual, with additional coaching. The study had two aims. First, it aimed to explore if there were differences in how the teachers in the two models perceived the influences of PT/ST on social engagement and social play skills in the children with SEN and if PT/ST supported social play between the participating children. Second, it aimed to examine the implementation feasibility of PT/ST and the influences on inclusion quality in the preschools, with and without coaching. These were the research questions:

1. Were there differences in how the teachers that received and did not receive coaching perceived social play skills and social engagement in children with SEN?
2. Did PT/ST support social play among children with SEN and their TD peers? What were the facilitators and barriers to social play?
3. Were there differences in the fidelity and completion of the PT/ST implementation in preschools that received and did not receive coaching?
4. How was the inclusion quality in the preschools that did and did not receive coaching?

Materials and methods

For this multiple case study (Yin, 2018) we used a mixed-method approach with both simultaneous and sequential strategies to analyze the data (QUAL/quan; Morse, 2010), and we summarized the data in four descriptive case studies (Corr et al., 2020).

Recruitment of participants and training of teachers

Inclusion criteria

To participate in the study, the preschools needed consent from the guardians (a) for one child, the staff considered to have SEN in social play with peers, with or without disabilities, and (b) for one or more children, the staff considered as socially skilled (hereafter, peers), aged between three to five. We allowed all settings that signed up for the study meeting these criteria to participate. However, we had set a limit of 10 participating preschool units/classes to enable the coaching and observations that the first author would make during the study.

A convenience sample

We recruited the participants via a research-practice network that included principals, teachers, childcare workers, and special educators from different preschools

and municipalities in Sweden. Since childcare workers often have similar responsibilities as teachers to plan and perform activities in Swedish preschools, they could also sign up for the study. Based on our previous knowledge of Swedish preschools, most settings enroll more than one child with a disability or other SEN, making it possible for several preschools within the network to participate. By this convenience and snowball sample, we also assumed some variation of the preschool settings (Bryman, 2016) for size, organization, and pedagogical orientation. Via the network, we sent an invitation to a workshop on the background and purpose for PT/ST, which reached 94 staff. Of these, 15 agreed to the workshop, which lasted about 5 h. At the end of the workshop, we submitted the study request, to which two preschools responded positively (Alpha 1, Beta 1). Later, three additional preschools from the network signed up for the study (Alpha 2, 3, Beta 2).

The two model implementation design, the basic training, and dropout

We divided the five preschools into two groups, one where the teachers should get basic training and instructions for PT/ST (Alpha 1–3) and one where the teachers should get additional coaching (Beta 1–2). In January 2018, the three teachers (from Alpha 2, Alpha 3, and Beta 1) participated in a 4-h training and instruction session. This session included a video-recorded role-play of the learning activities performed by the first and second author and question time and instructions for the teacher-observations of the children with SEN; pre-and post-PT/ST (see section “Measures”). Since the teachers at Alpha 1 and Beta 2 could not participate in the first session, they received the corresponding basic training and instruction by the first author in February 2018, including the video-recorded role-play and question time at their preschools. These lasted about 2 h, respectively. After completing the basic training from February and ahead, the teachers should perform three learning activities per week, including their pre-and post-observations. The teacher in Alpha 3 dropped out of the study due to staff changes after completing the initial observations (for the recruitment and training procedures see [Supplementary Table 1](#)). For the four preschools that participated in the study ([Table 1](#)), we extended the implementation period to June 2018 due to children or staff’s sick leave causing delays. As noted in [Table 1](#), all participating preschools had access to one contracted special educator. For the preschool’s Alpha 1 and Alpha 2, we instructed their special educators not to coach the preschool teachers in the PT/ST intervention.

The additional coaching

The first author conducted the coaching for the teachers in Beta 1 and Beta 2, in direct connection with the fidelity observations of learning activities (see section “Measures”) three times at each preschool, early in the implementation. The coaching addressed the goal of the last and the preceding

TABLE 1 Description of the participating preschools.

	Alpha 1	Alpha 2	Beta 1	Beta 2
Municipality population	39,000	78,000	960,000	78,000
Type of municipality	Industrial/rural	Suburban	City	Suburban
Type of preschool	Municipal	Independent	Independent	Municipal
Additional pedagogical orientation to the compulsory Swedish preschool curriculum	No	Reggio Emilia	Reggio Emilia	No
Teacher/children ratio	6.3	6.3	5.2	5.6
Number of children, setting	95	95	115	60
Number of children, intervention unit/class	19	19	21	17
Age of children, intervention unit/class (years)	3–4	4–5	3–5	1–4
Opening hours (a.m. to p.m.)	6.30–5.30	6.30–5.30	6.30–6.30	6.30–5.30
Access to a contracted special educator	Yes	Yes	Yes	Yes

Data on municipality population and teacher/children ratio are approximate.

TABLE 2 Participating children and teachers with pseudonyms for the case studies.

Preschools	Intervention children with SEN	Age (in years)	Type of SEN	Intervention peers, age (in years)	The teachers, work experience (in years)
Alpha 1	Alex ♂	4	ASD	Sara ♀ (5)	Anita ♀ (10) ^a
Alpha 2	Bill ♂	4	Unspecified	Sam ♂, Sofie ♀ (4)	Beatrice ♀ (15)
Beta 1	Carl ♂	5 1/2	Unspecified	Simon ♂ (5 1/2)	Celia ♀ (5)
Beta 2	Dean ♂	5	ASD, limited verbal speech, using PECS	Sigge ♂, Sebastian ♂ (5)	Danielle ♀ (10)

SEND, SEN, Special Educational Needs with or without a Disability; ASD, Autism Spectrum Disorder; PECS, Picture Exchange Communication System (Frost and Bondy, 2002).

^aExperienced child care worker that during the study underwent preschool teacher education.

learning activity with guiding questions such as “What did you do?,” “How did it feel?,” “What do you think about what happened?,” and “What would you like to do differently?” (Kucharczyk et al., 2012). Since the teachers did not perform the learning activities concurrently, the coaching sessions occurred differently and varied in time from 10 to 36 min.

Participants

The teachers

Three teachers and one experienced childcare worker (hereafter, teachers) participated in the study (Table 2). The teachers had an average work experience of 10 years.

The children

Ten children participated in the study, four of the children had SEN, and six of the children participated as peers (Table 2). **Alex** was a 4-year-old verbal boy with ASD. His peer Sara was a 5-year-old girl. **Bill** was a 4-year-old verbal boy. His peers were Sam and Sofie, a boy and a girl, 4 years old. **Carl** was a five-and-a-half-year-old boy. Carl went to a speech therapist due to speech difficulties. His peer was Simon, a five-and-a-half-year-old boy. During the study, Simon was a little bit concerned over changes in the home situation, which could have influenced his social engagement with peers

in preschool and he interrupted his participation after 11 lessons/play activities. **Dean** was a 5-year-old boy with ASD. Dean used Picture Exchange Communication System (PECS; Frost and Bondy, 2002) to communicate as he had few spoken words. Since Dean was older than the other children in his unit, two children at his age from another unit/class in the preschool participated as peers, Sigge and Sebastian, both 5 years old. During the PT/ST implementation, the teacher instructed and prompted Dean and his peers in PECS, simultaneously with her instructions on their play interactions.

Dropout of peers

The PT/ST manual suggests that the preschools ask for consent for more than one peer to compensate for any absences that may prevent their participation during the implementation. However, the same child with SEN is expected to participate. Alpha 1 and Beta 1 had consent for more than one peer in case of dropouts and planned the PT/ST activities for one peer at a time. Alpha 2 and Beta 2 had consent for two peers and planned the PT/ST activities for two peers at a time. According to the teachers' logbooks, another peer than Sara in Alpha 1 discontinued participation after three lessons/play activities, and one peer in addition to Sara participated in lesson/play activity 12; in Beta 1 the peer Simon discontinued participation after 11 lessons/play activities, and another peer participated in five lessons/play activities. Since we have no further data about these

children they are not included in the study. In Alpha 2 and Beta 2, the two peers participated throughout the implementation.

Implementation procedures and processes

The program: Play time/social time

Play time/social time (PT/ST) addresses 3–5-year-old children and focuses on six observable social skills that children use to begin or maintain social play interactions with peers, with potential for friendships; sharing with others, requesting to share, persistence, initiating/organizing play, agreeing to play, providing help, and helping others (Odom et al., 1997). The PT/ST program covers 28 lessons with play activities. It starts with three introductory lessons, where the teacher set up, introduces a play activity, and talks to the children about playing together. The following 25 lessons contain two parts. In the first part of the lesson (about 5 min), the teacher introduces a new social skill, reviews the previously learned social skills, and lets each child practice/repeat the target skill, first with the teacher and then with the peer/peers. The teacher playfully demonstrates and models how to interact. In the second part of the lesson, the play activity follows (about 5–10 min), where the children practice the skills. The teacher has prepared the play activity in advance with toys and materials. Each play activity focus on a specific theme, e.g., pretend play like a grocery or constructive play like building blocks. The teacher introduces the play activity, suggests how to use the toys and materials and interact, for example, by assigning the children interaction roles appropriate to their current levels of social skills, and may prompt the children and give them feedback without overly directing their play.

Translations and adaptations of the manual and program

An authorized translator translated PT/ST to Swedish. For the implementation instructions, we used “learning activity” as the overall concept for the lessons and play activities. Further, we used “mini-circle time” for the first part of the lesson, and “playgroup” for the following play activity. “Lesson” is not used in Swedish preschools even though the concept of *teaching* was launched for preschool in addition to *care*, through the current Education Act in 2010 (SFS, 2010/800; Sheridan and Williams, 2018). However, circle time is a teacher-instructed preschool activity practiced in most Swedish preschools, which is structurally similar to a lesson. During circle time, the teachers call over the children, inform them about activities, initiate theme discussions, and sing together with the children (often sitting in a circle on the floor). In this study, the teachers implemented the learning activities with a less structured use and reduction of scaffolding than in the original program (Odom et al., 1997), although the teachers

were still encouraged to give prompts and feedback to the children when needed.

Measures

Teacher impression scale

Before and after implementing the PT/ST program, the teachers conducted three to four approximately 5-min play observations using the teacher impression scale (TIS) (Odom et al., 1997) for each of the children with SEN. The TIS has 16 items reflecting prosocial behaviors that children use to initiate or maintain contact and interactions with peers at play, like “The child is persistent at social attempts,” “The child continues an interaction once it has begun.” The teachers assessed the extent of these behaviors on a five-point Likert scale (1 = never performs skill to 5 = frequently performs skill) and completed the ratings on the TIS immediately after each observation. When the teachers had completed all the observations, they calculated the average score for each item, pre, and post. In previous Swedish studies, the internal consistency for TIS was high, with Cronbach’s alpha (CA) = 0.97 (Gladh et al., 2021; Sedem et al., 2022). It also had highly correlated test-retest scores ($r = 0.94$) (Sedem et al., 2022).

Children’s engagement questionnaire

Complementing the information from the TIS observations of the children with SEN, the teachers used CEQ (McWilliam, 1991) before and after the implementation of PT/ST. The original children’s engagement questionnaire (CEQ) has 32 items to assess young children’s engagement in relationships and activities. It has previously been validated and adapted for teachers in Swedish preschools (Almqvist, 2006), with high internal consistency (CA = 0.92). For this study, the teachers completed three subscales of the original CEQ (Granlund et al., 2015). These were *CEQ1 Engagement* with 29 questions like “Tries new ways to play with things,” *CEQ2 Interaction with other children* with 16 questions like “The child understands what other children mean,” and *CEQ3 Interaction with the preschool teacher* with 16 questions like “The child understands what I mean.” In CEQ1, the teachers estimated each item on a four-point Likert scale (1 = rarely happens to 4 = happens very often). In CEQs 2 and 3, they estimated each item on a five-point Likert scale (1 = seldom to 5 = most often).

Inclusive classroom profile

To evaluate the inclusion of preschool quality for children with SEN in preschools, the first author conducted inclusive classroom profile (ICP) observations (Soukakou, 2012, 2016; Soukakou et al., 2014) as a trained observer, twice at each preschool, one before and one after PT/ST. Each observation took between two and 3 h to complete. The ICP, which employs a 7-point Likert Scale format (1 = inadequate, 5 = good, and

7 = excellent quality), has 12 items based on factors supporting development in children with SEN (Soukakou, 2016). For this study, we selected the items focusing on social interactions and play. These were (2) *Adults' involvement in peer interactions*, (3) *Adults' guidance of children's free-choice activities and play*, and (6) *Relationships between adults and children*.

Video-recorded learning activities

During the study, we had mini-circle times and playgroups video-recorded, comprising 209 min of material: Alpha 1; 37 min, Alpha 2; 1.23 min, Beta 1; 54 min, and Beta 2; 35 min. From this material, we selected three playgroups for each of the four children with SEN. These were from the beginning and the middle of the PT/ST implementation. We analyzed a 5-min sequence for each of the 12 playgroups, yielding 60 min of video recordings (Table 3). For playgroups that lasted 5 min, we selected the whole sequence of play that started immediately after the mini-circle time (five cases). When the video recordings of the playgroups were more than 5 min, we counted 5 min from the end of the playgroup and back and started analyzing from there to include the end of the play (seven cases). To analyze the video-recorded playgroups, we used the coding scheme Observation of Social Participation in Play (OSPiP; Allodi Westling et al., 2019). OSPiP is based on the Friendship Observation Scale (FOS) (Bauminger et al., 2008), and was adapted to the content of PT/ST. It includes (1) Play Behavior (*unoccupied, onlooker, solitary play, parallel play, cooperative play*); (2) Social Play Behavior (*share toys with peers, ask for help the peer, offer to help the peer, other type with the peer, persist in interaction, keep trying, give suggestions, organize, solve problems, no pro-social behavior*); (3) Communication (*no/non-verbal communication*); (4) Interfering Behavior (*stereotype, negative, and no interfering behavior*); (5) Expressing emotions

(*positive, negative, neutral*). The OSPiP has a partial sampling format based on 15-s intervals, and we used it with the Noldus Observer XT software, version 14.2 (Zimmerman et al., 2009). The primary behavior within each of the previously described categories occurring during the interval was coded. If multiple behaviors occurred during the session for relatively the same amount of time, the most advanced or positive behavior was coded. Two coders independently analyzed 42% of the video-recorded playgroups, and the interrater reliability with Cohen's kappa was 0.87, thus considered as strong (McHugh, 2012).

Fidelity observations, completion checklist, and logbooks

To evaluate the fidelity of the implementation, the first author performed observations of 14 learning activities with a revised version of an implementation checklist for social interaction interventions, corresponding to PT/ST (Odom et al., 1997). For convenience, since the preschool Alpha 1 was located geographically more distant than the other preschools, their special educator performed fidelity observations and video recordings for the study. For similar convenience, the special educator at Beta 1 performed two fidelity observations. To monitor to what extent the teachers applied PT/ST, the teachers used a checklist to fill in the dates for their completed PT/ST activities (for fidelity and completion checklists, see Supplementary material).

Data analysis

To examine how the teachers perceived social skills in free play situations and the engagement in social interactions and preschool activities for children with SEN, we calculated their pre, and post-intervention mean scores and SD for the TIS (Odom et al., 1997) and the CEQs (McWilliam, 1991;

TABLE 3 The sample of analyzed playgroups (PG) with PT/ST learning goals^a for children with SEND (Alex, Dean) and SEN (Bill, Carl) and their peers (Sara, Sam, Sofie, Simon, Sigge, Sebastian).

	Alex (Alpha 1)	Bill (Alpha 2)	Carl (Beta 1)	Dean (Beta 2)
PG # 3: Sharing and persistence				Sigge, Sebastian
PG # 4: Sharing and persistence—review and practice		• Sam, Sofie		• Sigge, Sebastian
PG # 5: Sharing and persistence—review and practice	• Sara		• Simon	
PG # 7: Requesting to share—target children	• Sara		• Simon	
PG # 9: Sharing, persistence, requesting to share—review and practice	• Sara			• Sigge
PG # 10: Sharing, persistence, requesting to share—review and practice		• Sam, Sofie	• Simon	
PG # 11: Play organizing—peers		• Sam, Sofie		
Minutes	15	15	15	15

PT/ST, play time/social time (Odom et al., 1997); SEND, SEN, Special Educational Needs with or without a Disability.

^aThe preschool teachers were instructed to perform three learning activities per week, including mini-circle time and playgroup, from February to June 2018.

Granlund et al., 2015). By analyzing the video recordings with OSPiP, we obtained data on frequencies and proportions for play and prosocial behaviors in the children with SEN from the beginning and the middle of the implementation (Figures 1, 2, also see Supplementary Figures 1–4, and Supplementary Tables 2,3). From these video recordings, we traced examples

of facilitators and barriers to children’s social play, of which we selected two representative vignettes for each child with SEN. The selection of vignettes reflected the variation of social play behaviors and skills for each child with SEN and corresponded in time for the playgroups for all children with SEN. These were for Alex from playgroups 5 and 9; Bill from

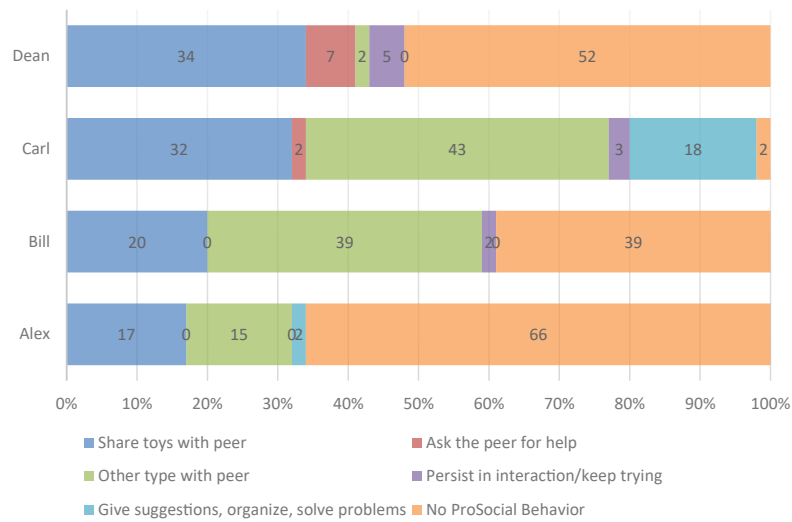


FIGURE 1 Distribution of prosocial behaviors (%) for children with SEN during 12 video-recorded PT/ST playgroups with peers (15 min/child), observed with OSPiP. For Alex playgroup 5, 7, 9; for Bill playgroup 4, 10, 11; for Carl playgroup 5, 7, 11; and for Dean playgroup 3, 4, 9; PT/ST = play/time social/time (Odom et al., 1997); SEN = Special Educational Needs; OSPiP = Observation of Social Participation in Play (Allodi Westling et al., 2019).

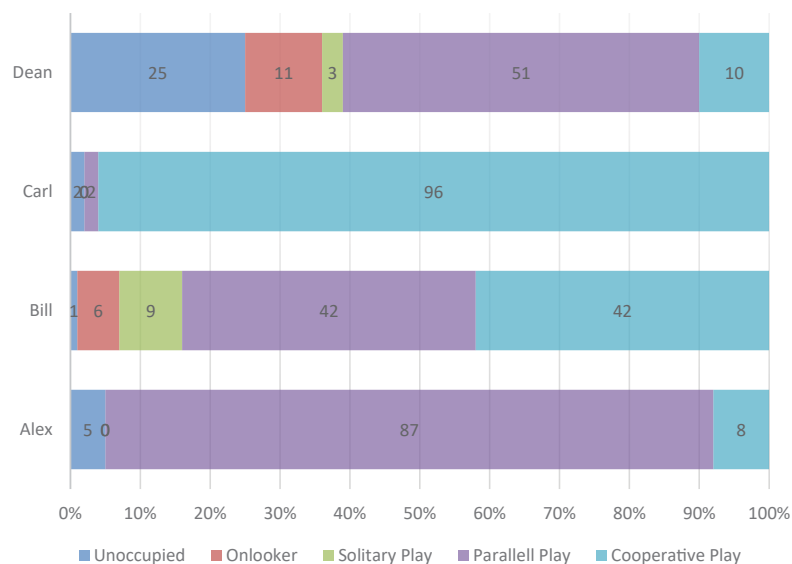


FIGURE 2 Distribution of play behaviors (%) for children with SEN during 12 video-recorded PT/ST playgroups with peers (15 min/child), observed with OSPiP. For Alex playgroup 5, 7, 9; for Bill playgroup 4, 10, 11; for Carl playgroup 5, 7, 11; and for Dean playgroup 3, 4, 9; PT/ST = play/time social/time (Odom et al., 1997); SEN = Special Educational Needs; OSPiP = Observation of Social Participation in Play (Allodi Westling et al., 2019).

playgroups 4 and 11; Carl from playgroups 5 and 11; Dean from playgroups 4 and 9. Since Carl exclusively played cooperatively in the sample of playgroups, his two vignettes describe only facilitators for play synch, while the others describe both facilitators and barriers.

Ethical considerations

The Regional Ethical Review Board in Stockholm approved the study (Diary Number 2016/5:8), and it follows the regulations for research data (SFS, 1998/204, 2018/218; General Data Protection Regulation [GDPR], 2016/679). Principals and preschool teachers were informed about the study and submitted consent for participation. The guardians of the children in the study were informed about the study and consented to their children participating. This consent included agreements for participation in the PT/ST activities, the observations, and the video recordings. In addition, the teachers were aware of the children's willingness to participate, from PT/ST activity to activity. The guardians at the preschools whose children did not participate in the PT/ST activities, the observations, and the video recordings received information about the study. There were no reports of harm by the children or the preschool staff.

Results

Alex, Alpha 1

Fidelity and completion of the play time/social time implementation

At Alpha 1, the teacher Anita implemented PT/ST with training and manual and without coaching. She fulfilled fidelity of PT/ST to a relatively high degree, 70% (Table 4). Sometimes, in the mini-circle times during the fidelity observations, Anita did not describe to Alex and the peer Sara ways to play with each other and the material and did not repeat the rules for the playgroup. In her instructions, she sometimes did not give any examples of how they were good playmates previously concerning the skills in PT/ST. Otherwise, she adhered to the instructions. The completion of her PT/ST implementation was high, 82% (Table 4). According to her completion checklist, Anita just excluded the three introductory mini-circle times, and the learning activities 20 and 25.

Adult involvement in peer interactions, adults' guidance of children's free-choice activities and play, and relationships between adults and children

Pre-test observation with ICP regarding preschool inclusion quality took place indoors and post-test observation outdoors.

For Alpha 1 it was noted an increase in inclusion quality in the ICP observations regarding the teachers' involvement in peer interactions (from score 3 to 4), and guidance of children's free-choice activities and play (from score 2 to 6), before and after PT/ST (Table 5). For relationships between teachers and children, no difference was observed, thus remaining low (score 2).

Social skills in free play situations and the engagement and involvement in social interactions and preschool activities

According to the teacher's observations with TIS (Table 6), Alex's use of social skills increased after the implementation of PT/ST (from a total mean score of 2.7 to 3.4). Correspondingly, the teacher estimated an increase in the engagement and involvement of preschool activities in CEQ1 (from a total mean score of 2.7 to 3.3) and social interactions with peers in CEQ2 (from a total mean score of 2.1 to 3.1). The increase was lower for interactions with staff in CEQ3 (from a total mean score of 4.3 to 4.4) (Table 6).

Prosocial and play behaviors with peers during play time/social time playgroups

In the sample of video-recorded playgroups at the beginning and middle of the implementation of PT/ST, Alex used prosocial behaviors 34% of the time. For Alex, these behaviors were primarily about sharing and other prosocial behaviors like seeking the peer Sara's attention or giving her attention and temporarily proposing a play idea (Figure 1). Alex's play behaviors during these playgroups corresponded with how he used prosocial behaviors (Figures 1, 2). Sometimes Alex played cooperatively (Vignette 1), but primarily he engaged in parallel play (Vignette 2).

Vignette 1. facilitators for social peer play

For Playgroup 9 (*Sharing, Persistence, Requesting to share*), Anita has prepared the table by putting a large piece of paper in front of Alex and Sara. She has also provided them with each pencil in different colors and has put more pencils in other colors on the table closest to Alex. Anita suggests Alex and Sara draw their families, to which they both respond positively. As in the previous session, Alex engages most in parallel play. However, as Anita comments on their drawings coming together, the play shifts from parallel to cooperative. Literally and figuratively, Alex has drawn his father so tall that he ends up in Sara's family. The session ends with Alex looking at Sara, seemingly amused as she laughs at the raindrops that she draws falling on her family.

Vignette 2. barriers to social peer play

For Playgroup 5 (*Sharing and Persistence, Review and Practice*) the teacher Anita has prepared the table for Alex and the peer Sara with a box of blocks and cars. When starting to

TABLE 4 Frequencies of fidelity and completion of PT/ST implementation in Swedish preschools ($N = 4$).

Preschool	Coaching	Peers in playgroups		Fidelity		Completion	
		<i>N</i>	%	<i>n</i>	%	<i>n</i>	
Alpha 1	No	1	70	39/56	82	23/28	
Alpha 2	No	2	87	49/56	89	25/28	
Beta 1	Yes (3 times)	1	91	51/56	57	16/28	
Beta 2	Yes (3 times)	1 or 2	88	37/42	46	13/28	

PT/ST, play time/social time (Odom et al., 1997).

TABLE 5 Inclusion quality in observations with ICP, items 2, 3, 6, before and after the PT/ST implementation, for the preschool units.

Ratings	Alpha 1		Alpha 2		Beta 1		Beta 2	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Item 2								
Adults' involvement in peer interactions	3	4	6	6	5	6	6	2
Item 3								
Adults' guidance of children's free choice activities and play	2	6	5	6	5	6	4	2
Item 6								
Relationships between adults and children	2	2	2	2	2	2	2	2

ICP, Inclusive Classroom Profile, min = 1, max = 7 (Soukaku, 2016); PT/ST, play/time social/time (Odom et al., 1997).

TABLE 6 Teachers' ratings of social skills, engagement, and involvement in interactions with other children and preschool staff at pre and post PT/ST-intervention for children with SEND (Alex, Dean) and SEN (Bill, Carl) observed with the teacher impression scale (TIS) and three children engagement questionnaires (CEQ).

Ratings	Alex		Bill		Carl		Dean	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
TIS								
Item mean	2.7	3.4	2.5	3.8	3.3	2.8	2.7	3.8
SD	1.54	0.90	0.63	0.54	0.81	0.83	1.34	1.11
Total score	43	55	40	61	54	45	44	61
CEQ1								
Item mean	2.7	3.3	2.1	2.8	1.7	1.8	1.8	2.3
SD	1.09	0.87	0.46	0.74	0.60	0.66	0.99	0.86
Total score	81	96	63	82	52	53	55	69
CEQ2								
Item mean	2.1	3.1	2.6	3.5	2.9	2.6	2.1	3.3
SD	1.13	1.05	0.69	0.70	0.96	0.68	1.11	0.78
Total score	35	50	42	57	47	43	34	54
CEQ3								
Item mean	4.3 ^a	4.4	3.5	4.6	3	3.6	3.3	4
SD	0.72	0.86	1.24	0.65	1.14	0.91	1.5	0.94
Total score	87 ^a	88	70	93	60	72	70	80

PT/ST, play/time social/time (Odom et al., 1997); SEND, SEN, Special Educational Needs with or without a Disability.

TIS, 16 questions, Likert scale, min = 1, max = 5 (Odom et al., 1997); CEQ1 Engagement, 29 questions, Likert scale: min = 1, max = 4; CEQ2 The child's interaction with other children, 16 questions, Likert scale: min = 1, max = 5; CEQ3 Preschool staff's experience of interaction with the child, 20 questions, Likert scale: min = 1, max = 5 (McWilliam, 1991; translated from Swedish to English from Granlund et al., 2015).

^aMissing value, item 1 The child begins the interaction, replaced with 3.

play with the blocks Alex exclaims "A tunnel!" Anita answers "Yes, can one build a tunnel?" Alex continues to build with the blocks on his own, without sharing the material with Sara or trying to play together with her. Nevertheless, he is playing close to her in a similar way and with the same material. When he is sharing, later in the playgroup, Anita has encouraged him to do so. During the playgroup, Alex mainly talks to Anita. However, he is also looking and laughing at Sara putting together her cars, and once calling her attention to his construction by shouting

"Look, Sara, look! A big tower!" Sometimes, we interpreted Alex's behavior as interfering. This is when he is avoiding Anita's attempt to get him to share blocks with Sara, or when he is protecting his blocks from Sara. Then Sara appears a little bothered, but seemingly she awaits Anita's actions rather than asking for blocks from Alex herself. Once at these moments, she looks questioningly, at the special educator who is video recording the playgroup. Alex, on the other hand, seems satisfied and happy with the situation.

Bill, Alpha 2

Fidelity and completion of the play time/social time implementation

Beatrice at Alpha 2 implemented PT/ST with training and manual, without coaching. She fulfilled fidelity of PT/ST for the participating children to a high degree (87%), see [Table 4](#). During the four fidelity observations, Beatrice twice did not describe the routine for the mini-circle time and the rules for the playgroup or described to Bill, and the peers, Sam and Sofie, how they were good playmates on previous days regarding the skills in PT/ST. Once she did not repeat the rules for the playgroup. Otherwise, she adhered to the instructions. Likewise, the degree of completion of her implementation of PT/ST was high, 89% ([Table 4](#)). According to her completion checklist, Beatrice just excluded the learning activities 15, 22, and 24.

Adult involvement in peer interactions, adults' guidance of children's free-choice activities and play, and relationships between adults and children

Regarding preschool inclusion quality, pre-test observation with ICP took place indoors, and post-test observation indoors and outdoors. For Alpha 2 it was noted an increase in inclusion quality in the ICP observations regarding teachers' guidance of children's free-choice activities and play (from score 5 to 6), before and after PT/ST ([Table 5](#)). For teachers' involvement in peer interactions, the scorings remained high (score 6), and for relationships between teachers and children, these remained low (score 2).

Social skills in free play situations and the engagement and involvement in social interactions and preschool activities

According to the teacher's observations with TIS, Bill had increased levels of social skills in play situations, from 2.5 in pre-observation to 3.8 in post-observation, in the total mean scores ([Table 6](#)). Correspondingly, the teacher-rated levels of engagement (CEQ1) increased from a total mean score of 2.1 to 2.8, involvement in interactions with peers (CEQ2) from a total mean score of 2.6 to 3.5, and with staff (CEQ3), from a total mean score of 3.5 to 4.6 ([Table 6](#)).

Prosocial and play behaviors with peers during play time/social time playgroups

For Bill, the analysis of the video-recorded playgroups shows that he often used prosocial behaviors with his peers, Sam and Sofie, to 61%, and with variation by sharing toys and persisting, for example ([Figure 1](#)). He also used other prosocial behaviors like standing in line for the restaurant. Correspondingly, as noted in [Figure 2](#), Bill played parallel and cooperatively with Sam and Sofie, to 42% respectively, in the sample of playgroups (*Vignette 3*). However, he also engaged in

solitary, and onlooker play, to 15%, with a few moments of being unoccupied (*Vignette 4*).

Vignette 3. facilitators for social peer play

Before Playgroup 11 (*Play organizing, Peers*), Beatrice has set the table for a restaurant play with a toy cash register, notebook, and pencil for the restaurant staff, and plates, mugs, plastic bags, two of each, for the customers. Bill plays cooperatively and seems socially engaged throughout this session. When he stands still, silent, he waits for his turn after Sofie to order food from Sam who runs the restaurant. He seems to enjoy the situation like Sam and Sofie and smiles sometimes. During the first half of the play, Bill does not say anything but shows non-verbal communication. He then speaks to confirm or tell his orders.

Vignette 4. barriers to social peer play

In Playgroup 4 (*Sharing and Persistence, Review and Practice*) the teacher Beatrice has prepared bricks to build tracks and tunnels for cars. Beatrice instructs Bill, Sam, and Sofie "Then you can start building the tracks! And, remember that you can make tunnels too." Initially, Bill engages in cooperative play. He follows Sam and picks up bricks for the common tunnel construction, which also Sofie is playing with, in interactions with both of them. Then his play behavior switches between onlooker and parallel play, and some seconds unoccupied. Bill seems to look at and listen to Sam and Sofie but plays alongside them. For example, by driving on the track that they have built, or by jumping himself as Sam is talking about the bump for the cars. Finally, his behaviors change to solitary play. Just before this, when Sam notes that Bill doesn't follow his construction plan, he tells him "But Bill, that's not how it should be," and to Sofie "Look what Bill has done, Sofie," and back to Bill "It should not be like this, Bill, it should be as if it is the bridge, that you jump over here. So that you land on that second jump." Sam shows Bill how he thinks he should act with the cars. Bill does not comment or act otherwise prosocial. After Sam has instructed and corrected Bill, Bill continues to play with his car alone. "Funny Bill," says Sam. Sam does not sound angry when saying this, and Beatrice, even though having her attention focused on their play, does not comment on this. When playing alone with the car on the floor, Bill drives his cars in circles, stereotypically. Emotionally, he appears neither happy nor sad, but for some moments a bit frustrated.

Carl, Beta 1

Fidelity and completion of the play time/social time implementation

The preschool teacher Celia at Beta 1 implemented PT/ST with training and manual, and coaching. She fulfilled fidelity of instruction of PT/ST for the participating children to a high degree (91%), see [Table 4](#). During the four fidelity observations,

Celia once did not introduce the mini-circle with a song, rhyme, or phrase, and twice did not describe the routine for the mini-circle time and the rules for the playgroup. During her instructions for Carl and Simon, she twice did not give examples of how they were good playmates on previous days concerning the skills in PT/ST. The completion of the PT/ST implementation at Beta 1 was low, 57% (Table 4). Celia excluded the learning activities 8–10, 13–20, and 23–25 due to sick leave for her, Carl, or other staff.

Adult involvement in peer interactions, adults' guidance of children's free-choice activities and play, and relationships between adults and children

The pre-test ICP observation regarding preschool inclusion quality took place indoors and the post-test observation both outdoors and indoors. For Beta 1, it was noted an increase in inclusion in the ICP observations quality regarding the teachers' involvement in peer interactions, from score 5 to 6, and guidance of children's free-choice activities and play, from score 5 to 6 (Table 5). For relationships between teachers and children, no difference was observed, thus remaining low (score 2).

Social skills in free play situations and the engagement and involvement in social interactions and preschool activities

According to the teacher's estimations, Carl showed decreased levels of social skills in non-staged play situations in pre-and-post observations with TIS, from a total mean score of 3.3 to 2.8 (Table 6). Similarly, he showed a decrease in their ratings with CEQ2, measuring his interactions with other children, from a total mean score of 2.9 to 2.6. However, after PT/ST the teachers observed somewhat increased levels of engagement, from a total mean score of 1.7 to 1.8, and interactions with teachers, from a total mean score of 3 to 3.6, in pre and post CEQ 1 and 3.

Prosocial and play behaviors with peers during play time/social time playgroups

In the sample of PT/ST playgroups from the beginning and middle of the implementation, Carl used prosocial behaviors to 98%. For Carl, these behaviors were primarily about sharing and other prosocial behaviors like waiting for his turn or agreeing with Simon but also about proposing play ideas, persisting in interaction, and asking Simon for help (Figure 1). Similarly, as noted in Figure 2, Carl played mainly cooperatively, to 96%, with Simon in the selection of playgroups (Vignette 5, 6). It was only for a few moments that he played in parallel with Simon or was unoccupied.

Vignette 5. facilitators for social peer play

For Playgroup 5 (*Sharing and Persistence, Review and Practice*), Celia has prepared two tables with goods for a

grocery. She gives Carl and the peer Simon play suggestions "We have a basket and a wallet with money. Here a person can buy things" (referring to one of the tables). Celia has put a cash register, money, and plastic bag at another table and says, "The salesperson can pack all the goods and count how much you have to pay." She instructs the peer Simon to be a salesperson and Carl to be a customer and switch roles. Carl and Simon play cooperatively throughout the session. Prosocial, Carl shares toys and play material with Simon, and follows his suggestions to continue playing. He starts taking up the goods from the bag to prepare the next section of the play, agreeing when he instructs him to scan the goods or directs them into different roles, and waiting in the store for him to start buying when Carl is the salesperson. They both seem satisfied and smile a lot. Carl talks during the playgroup, in response to Simon's questions and suggestions in the play and with the teacher. They also talk about things outside the play situation, seemingly without losing their play engagement.

Vignette 6. facilitators for social peer play

Ahead of playgroup 11 (*Play Organizing*), Simon the peer did not want to participate in the mini-circle time. Nevertheless, the staged play situation, the hamburger stand, occurred, where Celia supported the interactions between Carl and Simon as intended. In this session, Carl plays cooperatively, and he shows a variation of prosocial behaviors like in Playgroup 5. Celia is now included in the play, and she is the customer. First, Simon takes up the order, and Carl is sitting on the counter writing up the orders coming in, and giving suggestions for the menu. Simon gives Celia as the customer suggestions of what food they have. Carl confirms Celia's request for food: a hot dog. Simon is standing close to Celia who is ordering, telling her what they can offer. Celia instructs Simon to tell Carl to order. When Carl is sitting and writing on the menu, Celia prompts Simon to initiate another step of the play. She also instructs Simon to take her mobile phone and to tell Carl that he may pretend to order from it. In turn, Simon instructs Carl on what to say to Celia, who is now the customer "What do you want to order?" which Carl follows.

Dean, Beta 2

Fidelity and completion of the play time/social time implementation

The teacher Danielle implemented PT/ST with training, manual, and coaching. She fulfilled fidelity of PT/ST for the participating children to a high degree (88%), see Table 4. During the three fidelity observations, Danielle did not give examples for Dean, and the peers Sigge, and Sebastian, on how they were good playmates in previous days in

connection to the skills in PT/ST. Otherwise; she adhered to the instructions. In terms of completion, in turn, she fulfilled the learning activities to a low degree, 46% (Table 4), excluding learning activities 8, and 12–25, due to sick leave for her, Dean, or other staff.

Adult involvement in peer interactions, adults' guidance of children's free-choice activities and play, and relationships between adults and children

The pre-observation with ICP regarding preschool inclusion quality took place indoors and the post-observation outdoors. For these occasions, there was a decrease in the teachers' involvement in peer interactions (from score 6 to 2), and guidance of children's free-choice activities and play, from score 4 to 2 (Table 5). For relationships between teachers and children, there was no difference between observations, thus remaining low (score 2).

Social skills in free play situations and the engagement and involvement in social interactions and preschool activities

According to the teacher's estimations, there was a major change for Dean in using social skills in play situations before and after the implementation of PT/ST, from 2.7 to 3.8 in total mean scores for pre-and-post observations with TIS (Table 6). Similarly, there was an increase in the teacher's ratings of engagement and involvement in preschool activities (from a total mean score of 1.8 to 2.3) and social interactions with peers (from a total mean score of 2.1 to 3.3) and staff (from total mean score 3.3 to 4) for Dean on all three pre-and-post CEQs (Table 6).

Prosocial and play behaviors with peers during play time/social time playgroups

In the video-recorded playgroups at the beginning and middle of the PT/ST-implementation of PT/ST, Dean used prosocial behaviors 48% of the time. For Dean, he did so primarily by sharing toys, with 34%. He also asked his peers for help, to 7%, and persisted, to 5% (Figure 1). He once used other prosocial behaviors by bringing his PECS picture to communicate to his peers. Otherwise, when Dean was sharing during parallel play, Danielle prompted him to ask for a toy from his peers by pointing at the PECS picture. Then Dean, also prompted by her, took the picture and handed it over to Sigge or Sebastian. In turn, Sigge or Sebastian gave Dean the toy prompted by Danielle. Regarding using play behaviors with peers in the video-recorded sequences of the playgroups, the result for Dean corresponds to the extent of prosocial behaviors (Figures 1, 2). Dean was primarily engaged in parallel play, to 51%, with shifts to unoccupied play, to 25%, onlooker play, to 11%, cooperative play, to 10%, and solitary play, to 3% (Vignette 7, 8).

Vignette 7. facilitators for social peer play

For playgroup 4 (*Sharing and Persistence, Review and Practice*), Dean and his peers, are going to play with toy trains and tracks. Sigge and Sebastian build a rail in a circle, and Dean is first sitting beside onlooking or unoccupied. The teacher, Danielle, suggests Sigge and Sebastian build another track so that Dean can join; she also prompts Dean to ask for a piece with PECS so that he can extend the tracks together with Sigge and Sebastian. Sigge continues with a piece into the circle where Sebastian first laid a piece. Persisting, Dean cooperatively follows the invitation and puts his piece into the middle. However, Sebastian changes the pieces and Dean puts his train on the tracks, in parallel play. At the next point, however, Sebastian lets Dean put a straight piece of the track into the circle, rejecting Sigge's bent piece. Yet persisting, Dean takes a PECS picture to ask for a piece, again turning to cooperative play. When Dean exchanges the PECS picture to get a piece from Sigge (sharing), Sebastian disturbs this interaction, and takes the train from Sigge and throws it away. Beatrice then tries to help Dean and Sigge to continue sharing.

Vignette 8. barriers to social peer play

For playgroup 9 (*Sharing, Persistence, Requesting to share, Review and Practice*), where Dean and Sigge participate, Danielle has prepared pencils and coloring paper with three familiar cartoons; Superman, Spiderman, and Pokemon. Dean chooses one paper with Spiderman and Sigge one with Pokemon. Danielle puts the pencils next to Sigge and instructs Dean to ask for the pencils with his PECS picture of a pencil. Prompted by Danielle with the sign and the word for the color he wants, Dean immediately takes the PECS picture to request a pencil from Sigge. Dean and Sigge have one drawing each during the session. Throughout the playgroup, Dean exhibits parallel play. He consistently demonstrates non-verbal communication with Sigge, except when he engages in his drawing, but only communicates with him when exchanging pencils by using PECS.

Discussion

The first aim of this study was to explore how the teachers, who received/did not receive coaching, perceived the influences of PT/ST on social play skills and the social engagement in children with SEN, and if PT/ST supported social play between children with SEN and their peers.

The results of the teachers' observations with TIS and CEQ showed increased scores for social skills in free play and engagement in interactions with other children, after the application of PT/ST for three of the children with SEN in the study; Alex, Bill, and Dean. For the fourth child with SEN, Carl, the teacher did not observe the same increase in social skills in free play after PT/ST. Possibly this outcome could

reflect that his peer Simon, due to circumstances outside the preschool, became less socially motivated during the PT/ST implementation and interrupted his participation. Thereby it was not the same continuity in the playgroups as intended. However, in the CEQ estimations, the teachers perceived Carl to be more engaged in other preschool activities and interactions with them after PT/ST. Besides, he demonstrated exclusively cooperative play behaviors in the random sample of video-recorded PT/ST playgroups. This may indicate that adult-guided activities were favorable for his social participation.

Illustrated by the vignettes from the playgroups, all the children with SEN used social play and prosocial behaviors in the PT/ST playgroups, with some differences in the type and occurrence of social play behaviors. While, as noted, Carl only showed cooperative play behaviors, Alex and Dean mostly showed parallel play. Bill, in turn, engaged in as much parallel as cooperative play. In addition, the video-recorded observations showed that the extent of prosocial behaviors corresponded to the social play behaviors of children with SEN. The more complex or varying prosocial skills we observed, the higher the prevalence of more complex social play behaviors.

Through the video recordings, we could also identify possible facilitators and barriers to the children's social play in the playgroups. In our study, social play between the children seemed to occur when the toys and play materials similarly attracted the children and when the play situation and play goals, tasks, and roles engaged and fitted all the children. In addition, how the teachers instructed and encouraged the children in their interactions may have contributed to social play, although it is difficult to conclude from this study. Conversely, barriers to social play seemingly arose when the children were not attracted in the same way by the toys and play materials or when the play situation did not allow for a division of tasks or roles that resulted in shared play. The vignettes from the video-recorded playgroups also showed that communicative exchanges between the children seemed to be an integral part of children's social play interactions. These could include verbal and non-verbal communication, and alternative and complementary means of communication, such as PECS for Dean. When his teacher, Beatrice, prompted him and his peers to use PECS, social play interactions both seemed to arise and be a bit delayed. Regarding this, our results exemplify the understanding of social play that Janson (2001) has described. In this, social play is about interactions and community in three different but parallel contexts: the physical, the social (where communication is crucial), and the symbolic, which seem to coincide in children's expressions of togetherness.

Further, the vignettes in this study illustrated that Bill and Dean, at some points, were seemingly outside social play with their two peers, in a similar way as the peer Sara sometimes was outside when Alex was playing with the teacher (although all in safe and secure situations). Previous studies on friendship for children with ASD (Bauminger et al., 2008; Kent et al., 2020) have shown that it may be more challenging for a child who is

about to develop social play skills to maintain play interactions with several children involved. Similarly, Rouse (2018) found that it might be more difficult to support children with TD to play with children with low social skills if they have access to more socially responsive interaction partners. Furthermore, Freeman and Kasari (1999) pointed out that what might seem to be a lack of interest in peers can prevent children with ASD from reaching affiliation and developing friendships. In connection to the results from this study, this might indicate three things. First, teachers may need to support children differently, depending on how many are playing together. Second, even peers perceived as socially skilled may need social play instructions and encouragement. Third, when teachers apply an intervention such as PT/ST, they may need to consider the participating children's personal social play preferences, including what might appear as an unwillingness to social play (Odom, 2019). If children are not encouraged and instructed in social play interactions with peers, they may miss opportunities to learn social skills to both initiate and refrain from social play. Beyond that, Barton (2015) has concluded that social play, and not just social skills, should be an instructional goal for children who do not exhibit more advanced social play behaviors.

The second aim of this study was to examine the feasibility of implementing PT/ST with and without coaching, and the influences of the program on preschool inclusion quality. First, the coaching was positively associated with implementation fidelity, with lower levels of fidelity in the basic condition (Alpha 1 and Alpha 2) and higher levels of fidelity in the add-on model (Beta 1 and Beta 2). We expected these results, as previous studies have shown that coaching is important to achieve intervention fidelity (Strain and Bovey, 2011; Boyd et al., 2016). Nonetheless, in this study the levels of fidelity were also satisfactory for the two teachers in the basic condition, Alpha 1 and Alpha 2, indicating that the training, manual, and instructions reached far. Another result was that after implementing PT/ST, Alpha 1 and Alpha 2 had higher levels of completion than Beta 1 and Beta 2, even though not coached. They also had a higher T/C ratio. Even though we cannot comment on the significance of the allocation of resources for their implementation of PT/ST, factors that seem to have contributed to less completion for Beta 1 and Beta 2 were teachers' and children's sick leave and absence. For our study context, it has previously shown that staff shortages and lack of continuity in staff competence might influence measures for children with SEN (Roll-Pettersson et al., 2016; Ginner Hau et al., 2020).

Finally, higher levels of preschool inclusion quality regarding the teachers' involvement in peer interactions after the PT/ST implementation were observed for two of the four preschools (Alpha 1, Beta 1). For Alpha 2 the scorings for this item remained at the second-highest level (between *good* and *excellent quality*), before and after PT/ST. For these three preschools, higher levels of teachers' guidance of children's free-choice activities and play were also observed. Beta 2 instead

showed lower levels for both these items in the post-observation after implementing PT/ST. This means that the results of preschool inclusion quality were not associated with coaching in this study. One explanation for the lower scorings for Beta 2 could be that the post-observation was conducted outdoors in a different situation from the pre-test when the entire preschool had gathered in the yard to look at siblings leaving school for the summer vacation in a nearby building. In this situation, the teachers were not so close to the children so that they could pay special attention to children with SEN. Yet, the post-observations at the three other preschools in the study were partly also outdoors and they showed increased preschool inclusion quality regarding these ICP items. However, in these observations, they had organized teachers and children in groups in a similar way as indoors. This might indicate that it is possible to form inclusive learning environments even outdoors, although we cannot draw any sure conclusions about this from this study. None of the preschools in the study showed changes in the item concerning relations between teachers and children with SEN, with low levels in pre and post-observations. To score higher ICP levels for *Relationships between adults and children*, the preschools need to provide children with SEN, visual support, and additional resources for supporting their emotional needs and development. This even if they reach higher levels of later ICP criteria such as *Adult responsiveness to children's interests* and *Adult responsiveness to children's emotional needs*. A similar outcome appeared in a previous study that examined the use of ICP in Swedish preschools (Lundqvist and Larsdotter Bodin, 2018). Many Swedish preschools offer pictures for daily activities, but not visual support to express needs and feelings, which would be important to provide quality relationships between adults and children. If it were not for the lack of such support Alpha 1, Alpha 2, and Beta 1, would have reached levels of either good or excellent quality both pre and post-ICP, even for this item.

In summary, the results of this study suggest that the PT/ST activities made it possible for the children with SEN to engage in social play with peers and practice social skills, with and without coaching for their teachers. The results also indicate that coaching strengthened the intervention fidelity but did not seem associated with preschool inclusion quality; the two preschools that implemented PT/ST without coaching also received higher preschool inclusion quality scores at post-observation regarding adults' involvement in peer interactions and guidance of children's free choice activities and play.

Limitations and strengths

Due to the broad inclusion criteria for the participating children with SEN, and the lack of a control group, this study cannot generalize the results of the influences of PT/ST on their social play with peers and learning of social skills. Instead, the study may provide a *proof of concept*

(Oxford English Dictionary [OED], 2022) of PT/ST to support social play between children with and without SEN and their social learning, which would suggest further studies with a different design in Swedish preschools. Other limitations of this study are that two of the preschools did not fully complete the program and that we performed the ICP observations, pre, and post, in different situations, indoors and outdoors. In addition, even though PT/ST allows various peers to participate in the program, as in the preschools, Alpha 1 and Beta 1, this can be important in understanding the play engagement of the children with SEN. One strength of the study is that the different measures we used regarding social play, engagement, interactions, and social skills (TIS, CEQ, OSPiP) complemented each other when interpreting the results. Another strength is that the video-recorded playgroups provided an opportunity to analyze possible facilitators and obstacles for children's shared play experiences in teacher-led playgroups.

Conclusions and implications

The result from our study indicates that children's engagement and participation in social peer play seem to be associated with their common play goals, and a division of roles and tasks that they find meaningful and manageable. To enable this, preschool staff in inclusive settings may need to offer both children with and without SEN, targeted support, which the PT/ST program offers. Assigning peers for parts of the free playtime would extend PT/ST to an even more naturalistic form of instruction. In a continued implementation, the professional teacher training and coaching could also address the relational aspects of preschool inclusion quality. This could include resources to support children's social-emotional development and communication, and strategies for playgroups with two or more children included. From the results of this study, we also conclude that it would be necessary to involve more preschool staff in the implementation in each setting; both to ensure they all use similar approaches and to enable a more complete program fulfillment, as staff shortages may affect the continuity of implementations.

Data availability statement

The original contributions presented in this study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by the Regional Ethical Review Board

in Stockholm. Written informed consent to participate in this study was provided by the participants' legal guardians.

Author contributions

MG planned the study, recruited the participants, collected the data, performed the quantitative and qualitative analyses, and wrote the article. ES planned the study, supported the qualitative analyses, and contributed to the revision of the article. MWA planned the study, supported the quantitative analyses, and contributed to the revision of the article. SO wrote a section of the article and contributed to the revision of the article. All authors approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2022.943601/full#supplementary-material>

[Instruction_in_Preschool_Classrooms_Mary_B_Boat_Laurie_A_Dinnebeil_Youlmi_Bae_Volume_38_Issue_1.pdf](#)

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