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SAGA: results of a second trial testing a mentalizing-based reading intervention on children and staff in early childhood education

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Social—emotional development is a key factor in child well-being and development, and studying how it can be supported in early childhood is crucial. This study acted as a second trial testing the efficacy of a shared story book reading intervention combined with mentalizing discussions (SAGA), on children's ($N = 196$) social—emotional development. In contrast to the first trial, the current trial utilized a group comprised of mostly multilingual children, attending daycare in a minority language. In addition, we investigated the effect of the intervention on the mentalizing capacity of the staff. The staff of the early childhood education and care (ECEC) centers were trained to lead discussions about story characters' mental states with children three times a week. The staff's mentalization ability was measured by the self-reported Mentalization Scale (MentS). Children's social—emotional development was evaluated via the teacher-reported Strengths and Difficulties Questionnaire SDQ, and verbal fluency via a subtest from the NEPSY II neuropsychological test battery. After 12 weeks, the children in the SAGA group showed improvement in prosocial behavior, whereas no change was observed in the control group. Furthermore, within the SAGA group, the children showing initially lower scores for prosocial behavior displayed larger improvement compared to their peers with higher scores at baseline. No such intervention-based improvement emerged in verbal fluency. Unlike in the first trial, the intervention did not have an impact on children's internalizing or externalizing problems. The results suggest that story reading sessions combined with mentalizing discussions about emotions, thoughts, and intentions of the story characters may support children's social—emotional development within the realm of prosocial behavior, although the possibility to decrease children's internalizing and externalizing problems with these sessions remains unclear based on the two trials. In addition, training the ECEC staff in mentalization theory and guiding them toward mind-related dialogs improved staff motivation to mentalize, as well as their child-related mentalization capacity.

1 Introduction

Young children's social–emotional development is composed of several interdependent components, such as recognizing and regulating one's own emotions, empathy, turn-taking, and cooperation, along with prosocial behavior (Weissberg et al., 2015; Campbell et al., 2016). These components may be categorized into the maturation of the child's intrapersonal emotional competence and the development of interaction with other individuals. During infancy, children learn to recognize and respond to facial expressions, vocal cues, and gestures. By early childhood, the foundations of empathy, moral principles, and the ability to understand others have already been formed (Ruffman et al., 2002; Kochanska et al., 2003). Engagement in parallel play gradually transitions to more complex forms of social interaction, such as cooperative play and group dynamics.

Children's social emotional development is associated with several other constructs that directly impact their well-being and quality of life, including to language development (Longobardi et al., 2016; Rose et al., 2018; Rajalin et al., 2021; Kalland and Linnavalli, 2022; Jurkic et al., 2023). As children learn to communicate verbally, they also develop the ability to understand and express emotions, form relationships, and engage in social interactions. Social–emotional development is known to have strong links with later well-being, education, and employment (Caprara et al., 2000; Trentacosta and Izard, 2007; Denham et al., 2014; Jones et al., 2015). Thus, it is unsettling that 1–2-year-old children may already show disturbances in this development, which go unnoticed by the caregivers or daycare staff (Alakortes, 2018), and might lead to problem behaviors later on.

Mentalization refers to an individual's capacity to understand mental states that underlie overt behavior in oneself or another person (Fonagy et al., 1991; Meins and Fernyhough, 1999; Ensink and Mayes, 2010), and is closely linked to the concept of theory of mind. Whether thought of as coinciding or merely overlapping concepts, according to Fonagy et al. (2018), both emotion comprehension (typically associated with mentalizing) and belief-desire reasoning (more often associated with theory of mind) are crucial in fostering genuine social understanding. Children aged 3–5 undergo a gradual development in their theory of mind understanding, and this progression is associated with improved capabilities in comprehending others' intentions, desires, and emotions, leading to enhanced social competence over time (Wellman, 2014). According to several studies (Imuta et al., 2016; Longobardi et al., 2019; Shoshani, 2024), children's theory of mind understanding has a clear association with their prosocial behavior. Prosocial behavior is defined as "voluntary, intentional behavior that results in benefits for another" (Eisenberg and Miller, 1987) and is one of the key aspects of social–emotional competence. Thus, based on previous research, promoting mentalizing skills may have the potential to improve prosocial skills.

Numerous studies have investigated ways to support children's social–emotional development in the early years of life, particularly within the caregiver-child relationships and, more recently, in early childhood education and care (ECEC) settings. Secure child attachment and sensitive interaction between the child and the caregiver seem to have positive correlations with parental mentalizing (Fonagy et al., 1991; Slade et al., 2005). Parents' versatile use of language along with regular references to mental states appears to have a positive link to children's capacity to mentalize and to their overall social–emotional development, including the use of desire state language, and socially adaptive or prosocial behaviors (Ruffman et al., 2002; Jenkins et al., 2003; Carpendale and Lewis, 2004; de Rosnay and Hughes, 2006; Symons et al., 2006; Meins et al., 2013; Bekar et al., 2018).

In recent years, researchers have been applying mentalizing theory in developing interventions for schools with the aim of enhancing social–emotional development and preventing bullying. Examples of these are the "Peaceful School Program," to develop mentalizing school communities (Twemlow et al., 2018), and the "Thought in Mind" (TiM) project that emphasized promoting mentalizing in pupils by training their teachers in mentalizing (Valle et al., 2016). Within early childhood education, mentalizing theory has been used to study the impact of teacher mentalizing on children's theory of mind development with varying results (Mulvihill et al., 2023; Santelices et al., 2022) as well as on developing training programs for early childhood education teachers or teacher students (Marttila et al., 2023a,b). However, studies on the effects of promoting mentalization in early education staff on the social–emotional development of children seems to be at least scarce if not non-existant.

The ECEC settings provide an opportunity to support children's social–emotional development. Blewitt et al. (2018) conducted a meta-analysis on 63 intervention studies that had been carried out in ECEC settings. A range of methods had been used to promote social–emotional behaviors, among them games, picture cards, music, storytelling, and teaching and practicing emotion regulation and social skills. The review concluded that low-intensity interventions seemed to be particularly effective in improving emotional knowledge, regulation, and understanding in 2- to 6-year-old children. The duration of the interventions varied, but the differences in duration did not correlate with the outcome measures. However, older children appeared to benefit more from the interventions than the younger participants, and the activities led by trained specialists or researchers had a stronger positive impact on the measured development than those led by ECEC staff.

Shared storybook reading (SSBR) refers to the interactive process in which an adult reads a book with children and actively engages them in a discussion about the story. SSBR has been found to improve children's language development in several studies (Hargrave and Sénéchal, 2000; Gonzalez et al., 2014; Simsek and Erdogan, 2015). Furthermore, some recent studies have suggested that SSBR may be also effective in enhancing social–emotional development (Mendelsohn et al., 2018; Martin et al., 2022), especially if the story reading sessions involve age-appropriate discussions around the emotions and intentions of the story characters (Ornaghi et al., 2014, 2015; Bergman Deitcher et al., 2021). Stories can thus be a useful tool in creating discussion among pre-schoolers on mental and emotional states (Tompkins et al., 2018).

The SAGA intervention is based on mentalizing theory and aims to support under school-aged children's social–emotional development via SSBR sessions and discussions in the ECEC environment (Kalland et al., 2022). Small children can form attachment relationships with their teachers (de Schipper et al., 2008), and it seems that the social–emotional competence of the teachers is essential in providing emotionally supportive environment for the children (Jennings and Greenberg, 2009). Not all professional caregivers are able to emotionally support children who display disruptive or otherwise challenging behaviors. Instead, this competence varies, and some teachers may experience strong negative emotions toward those children who are in special need for support regarding their social–emotional development. Thus, it seems important

to create an intervention model enhancing potentially not only the children's social–emotional development, but also the professional caregivers' mentalizing competence, as has been suggested in a recent study investigating the importance of teacher mentalization (Valle et al., 2022).

When using the SAGA model (Kalland et al., 2022), SSBR sessions and facilitated discussions about the stories are planned to enhance children's social–emotional development and teachers' mentalizing. The model is inspired by the description of the reflective parenting stance (Midgley et al., 2017), and emphasizes a benign interest in the child's mind behind external behavior and emotional availability in helping children to understand their own and others' reactions, along with helping them to find words for their feelings.

The intervention emphasizes that SSBR combined with mentalizing discussions provides a safe context in which to explore emotions, desires, and intentions with an adult. Through story characters it is possible for children to distance themselves from the real-life situations that may raise unpleasant, difficult, or even traumatic feelings. Such sessions enable children to reflect on, e.g., conflicts with peers without being exposed to intense emotions leading to negative reactions and disruptive behavior. Furthermore, stressful situations and traumatic experiences make it more difficult for children to learn to mentalize (Rutherford et al., 2015; Luyten and Fonagy, 2019). As such, SSBR sessions with mentalizing discussions offer the children a "safe space," in which it is possible to name emotions and reflect on mental states of others with peers, guided by a caring adult (Kalland et al., 2022). Additionally, with intriguing yet not too overwhelming stories it is possible to create an optimal zone of arousal that facilitates self-regulation (Siegel, 1999).

The present study is the second trial investigating the effects of the SAGA intervention on children's social–emotional development, and additionally on the mentalizing capacity of the staff, which was not investigated in the first trial. The SAGA intervention was developed for ECEC centers. As most children in Finland start in ECEC at the age of three, interventions carried out in ECEC centers would be an effective way to provide accessible community level support to children's social–emotional development.

In the first trial, investigating the efficacy of the SAGA model, we compared SAGA with another intervention targeting social–emotional development and a passive control group. We found that children in the SAGA intervention advanced significantly in prosocial behavior and their internalizing and externalizing problems decreased more, compared to other groups. The comparison intervention showed similar but smaller effects on prosocial behavior and internalizing problems, whereas no change was detected in the passive control group (Martikainen et al., 2023).

Based on previous research on the association between mentalizing skills and social–emotional development (Imuta et al., 2016; Longobardi et al., 2019; Shoshani, 2024), and the results of the first trial using the SAGA-intervention, we hypothesize that when accompanied with mentalizing discussions:

H1: Shared story book reading sessions improve children's prosocial behavior.

H2: Shared story book reading sessions decrease children's internalizing and externalizing.

As there is evidence of a larger intervention-based increase in prosocial behavior in groups showing lower baseline scores for these skills (Flook et al., 2015; Schellenberg et al., 2015), we hypothesize that:

H3: Shared story book reading sessions provide larger gains in prosocial behavior for children showing low scores for this feature in the baseline compared to those scoring higher.

Furthermore, we hypothesize that:

H4: The mentalizing capacity of the ECEC staff will increase due to the intervention.

Based on previous studies (Hargrave and Sénéchal, 2000; Gonzalez et al., 2014; Simsek and Erdogan, 2015), we also hypothesize that:

H5: The shared reading supports children's verbal development.

All the hypotheses concern a group composed mostly of multilingual children.

2 Materials and methods

2.1 Participants

Sixteen ECEC groups in 10 communal, Swedish-speaking ECEC centers were recruited for the study. Swedish is Finland's second official language, spoken as a mother tongue by approximately 5 percent of the population. Information and consent letters were distributed to the caregivers of the 3- to 5-year-old children in these groups by the ECEC staff. The group size of all ECEC groups was 17–21 children, excluding one group in control ECEC center with only 12 children. Altogether 196 children (94 girls, 33 monolinguals) participated: 104 were in the SAGA group and 92 in the control group. Their mean age was 56.5 months ($SD = 9.5$, min = 36, max = 73) and the mean of their caregivers' education level was 3.4 (min = 1.5, max = 5; 1 = elementary school, 5 = doctoral/licentiate degree).

The ECEC centers were in four cities in South-Western Finland. The participation was based on the interest of the ECEC centers, which were allocated to intervention centers and waiting-list controls (Figure 1). The study protocol was approved by the University of Helsinki's Research Ethics Committee in the Humanities and Social and Behavioural Sciences.

In city 1, all five Swedish speaking ECEC centers participated in the study. In cities 2, 3, and 4, all the recruited ECEC centers represented middle-class or lower SES areas. A volunteer was recruited in each ECEC group to assist with administering the study and collecting the data and received a monetary compensation for their duties.

Originally 52 members of staff of the ECEC centers participated in the study by filling the Mentalization Scale (MentS), a self-assessment for mentalizing skills (Dimitrijević et al., 2018), before and after the intervention. One participant was excluded based on showing a change larger than four standard deviations from the group mean between the measurement points, for two out of three factors of MentS. In addition, three staff members in the control ECEC centers
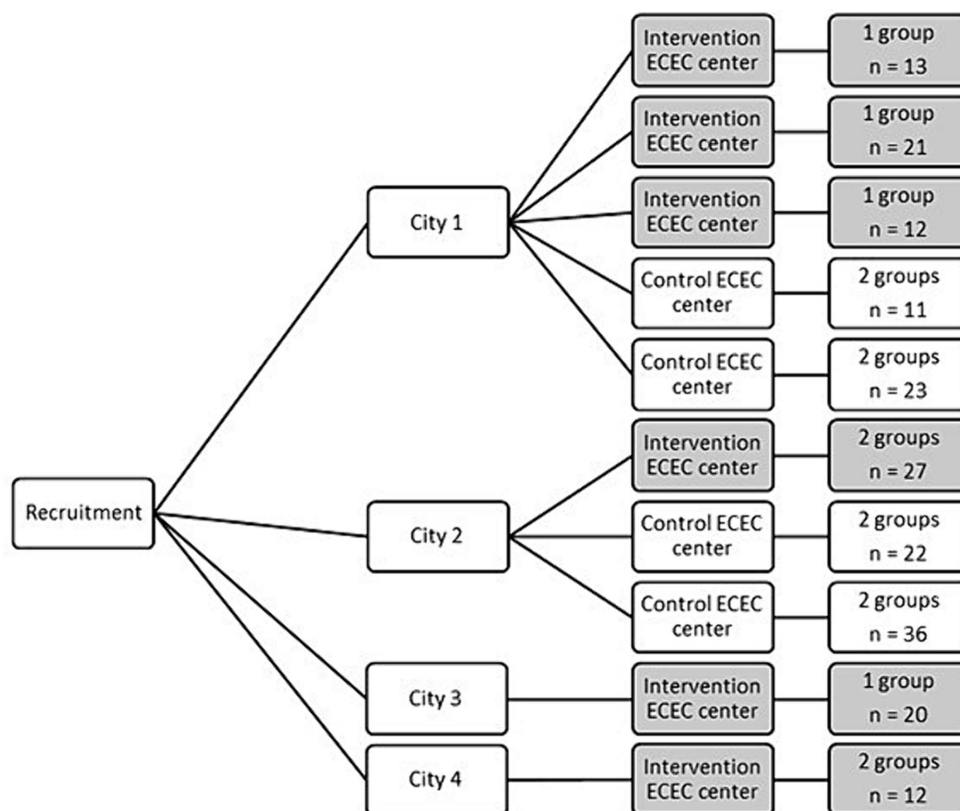
FIGURE 1
Allocation of early childhood education and care centers to intervention and control groups.

failed to answer the second MentS questionnaire and were thus excluded from the sample.

Twenty-five staff members took part in the SAGA training and carried out the intervention with the children. Out of the these, two had a master's degree, 10 had a bachelor's degree and 12 had at most completed secondary education. One staff member did not want to reveal their education level.

2.2 Materials

Social–emotional development was assessed with one questionnaire filled in at the beginning and at the end of the follow-up. The questionnaire was completed in Swedish by one staff member in each participating ECEC group. The same member of the staff filled in the questionnaire both times and did not have an opportunity to check the previous assessment before filling in the questionnaires after the intervention.

The Strengths and difficulties questionnaire (SDQ: https://www.sdqinfo.org/a0.html; Goodman, 2001) is a 25-item behavioral screening assessment for children and adolescents, with five subscales (emotional problems, conduct problems, hyperactivity, peer problems, and prosocial behavior). Each item is assessed on a scale from 0 to 2 (0 = not true, 1 = somewhat true, 2 = certainly true). Following the recommendation by Goodman et al. (2010), we used the three-factor model of SDQ: while Prosocial behavior is treated as a separate factor, emotional and peer problems form a factor for Internalizing problems,

and conduct problems and hyperactivity form a factor for Externalizing problems. According to Niclasen et al. (2013), the three-factor model shows equally good model fit as the original five-factor model. In the present study, the factors were formed by averaging the scores over the included items. The SDQ demonstrates strong discriminant validity (Ferreira et al., 2021) and notable predictive validity (Goodman and Goodman, 2011). While the SDQ's composite scales of internalizing and externalizing problems do not directly measure social–emotional development, their lower scores may serve as indicators of psychological well-being, a crucial component of this development (Campbell et al., 2016).

Verbal fluency was assessed with the Word generation subtest of the NEPSY II test battery (Korkman et al., 2008). The research assistant conducted the test alone with the child. The original test has four categories in which the child is asked to say aloud as many words as possible in 60 s, in the given category. In the present study, only animal and food/beverage categories were used.

The mentalizing capacity of the ECEC staff was assessed with a before-and-after intervention approach using a self-report measurement, The Mentalization Scale (MentS) (Dimitrijević et al., 2018). All the staff members working in ECEC groups that were recruited in the study were asked to fill in the questionnaire in Swedish. MentS has been found to show acceptable levels of internal consistency, as well as a theoretically valid factor structure (Đorđević and Đorđević, 2019; Ahmadian and Ghamarani, 2021; Bhola and Mehrotra, 2021; Jańczak, 2021; Richter et al., 2021). Also, Richter et al. (2021) found MentS to have a strong positive correlation with the

Reflective Function Scale (Fonagy et al., 1998), which is considered to be the "gold standard" for assessing mentalization but requires extensive training and time-consuming analyses before providing results. MentS builds on three factors, MentS-Self (MentS-S, 8 items) and MentS-Others (MentS-O, 10 items) assessing the ability to mentalize one self's or other people's minds, and MentS-Motivation (MentS-M, 10 items) assessing the respondent's motivation to mentalize about other people. In the current study, the MentS assessment was adapted for ECEC staff, so that the items originally referring to "other people" referred to children.

While higher scores in Prosocial behavior, Word fluency, and MentS correspond to better skills in the measured feature, higher scores in Internalization and Externalization correspond to more problems in the investigated area.

2.3 Stories and dialog cards in the SAGA intervention

The SAGA groups were given 17 stories each, along with dialog cards to accompany them. The stories were chosen based on their emotional content and contained stories dealing with, e.g., loneliness, friendship, and emotion regulation. The stories varied in complexity. All stories included pictures that could be shown to children while reading. For each story, a dialog card was created. Cards presented general guidelines for executing SAGA sessions and story-specific questions that might be used to launch a discussion with children (e.g., "What does it mean to love"). The questions that could be answered with a simple "yes" or "no" were avoided to encourage a diverse discussion without "correct" and "incorrect" answers.

2.4 SAGA intervention

The ECEC staff were trained in two two-hour training sessions held online. All staff members but one participated in the training, irrespective of their education background. In line with the regulations of Finland, all the participating groups included at least one staff member (out of 3–4 adults in every group) with a teaching qualification (bachelor's or master's degree). During the training, the mentalizing theory, the key aspects of children's social–emotional development, and the role of mentalizing in this development were presented with examples. The SAGA model was introduced and discussed, and the staff practiced posing mentalizing questions about a story that was read together. Because of the dialog cards created for this study, staff did not need to come up with their own questions during SAGA sessions, but the aim of the training was to highlight the importance of emotion-related reflections instead of action-oriented inspection of the read story. The staff were encouraged to contemplate the story characters' intentions, affects, desires, and emotions behind their explicit behavior with the children, and help them to recognize and name emotions. It was emphasized that the focus of the model is on these functions, instead of on, e.g., the plot of the stories, and that there were no correct or incorrect answers. According to previous studies on shared book reading, teachers typically do not foster discussions with open-ended questions or encourage children to contemplate the answers to the questions more (Deshmukh et al., 2019; Hindman et al., 2019), and thus, training was needed. The children and the adult were

to reflect together on the motives, experiences, and emotions of the story characters. Especially important was that the adults would adopt a "not-knowing stance" regarding children, i.e., not to assume anything about children's state of mind but remain curious about their internal world and show acceptance for children's perspectives.

To encourage participation by the less expressive children, small groups were recommended for SAGA reading sessions. The ECEC staff were particularly recommended to encourage the more withdrawn children to express their thoughts. The stories created a "safe space" for discussions – instead of having to experience negative emotions, children were able to discuss them distinct from their own experiences. The staff were encouraged to take children's own thoughts as starting points to the subsequent discussions. It was emphasized that this was more important than to go through all the questions in the cards or finish the story during the SAGA session. One story could be interrupted and continued the next time, read once or several times, depending on the children's interest. For a closer description of the SAGA-intervention and the research design, see Kalland et al. (2022).

The length of the SAGA intervention was 12 weeks. The model included three 15- to 20-min SSBR sessions a week for each child, in groups of four to seven children during the reading sessions. The formation of the reading groups was left to the staff to decide, but it was recommended that they should stay the same throughout the intervention. The SAGA model was planned to fit in the ECEC centers' daily routines and to overlap with practices that are typically performed during daycare. Thus, it was expected to be easily adopted by the ECEC staff.

During the SAGA session, the adult read a story or a part of it. After or in the middle of the story, she/he asked the children questions with the help of a dialog card created for the intervention. In addition, the children could interrupt the reading and ask questions or comment on the story. At the beginning of the follow-up, the staff were recommended to use the given stories and cards but were encouraged to come up with other stories and create their own questions later, as the concept became more familiar to them. The aim of the questions was to launch a group discussion, arising from, but not necessarily tied only to the read story. In addition, the children were allowed to interrupt the reading by asking questions or to reflect on the story.

To confirm the model fidelity, the staff were met online twice during the follow-up to discuss their insights and possible problems concerning the reading sessions.

The staff in the control ECEC groups were instructed to continue with similar reading habits as before. They were offered the SAGA model training after the research phase.

2.5 Statistical analyses

The statistical analyses were conducted with IBM SPSS Statistics 28 (IBM Corporation, New York, United States). The change over time in the tests and assessments was analyzed with linear mixed-model analyses with restricted maximum likelihood, separately for each measure. Model fit was defined with Bayesian information criteria. The varying intercepts across the ECEC centers, ECEC groups, and individual children, as well as members of the staff were tested by running basic models with time as fixed factor and the participants, groups, and ECEC centers as random factors with a random intercept. The effect of time in intercepts across the participants varied

significantly in all models ($p < 0.001$), and additionally across the ECEC group for Internalizing problems. Subsequently, individual children and staff members were treated as a random factor with a random intercept in all models, and additionally, the ECEC group was treated as a random factor with a random intercept in the model for Internalizing problems. The intervention group, time, and children's age and gender acted as independent factors in all models concerning children. The parents' education level had no significant main effect or interaction in the preliminary analyses and was thus left out of the final analyses. The interaction term 'time x intervention' was added to the model to investigate whether the effect of time on each dependent variable differed in the intervention and control groups.

To test hypothesis three, we inspected the change over time in Prosocial behavior within the groups. In these models, time and Prosocial group (low scores vs. medium to high scores) acted as independent factors. Regarding hypothesis four, time and intervention (SAGA vs. Control) acted as independent factors.

There were no violations to assumptions regarding normality of residuals, homoscedasticity, and multicollinearity in any of the models. The alpha level was set at $p < 0.05$.

3 Results

The internal consistencies as measured by Cronbach's alpha for the three SDQ factors ($a = 0.808$–0.857) were high at both measurement points. There were no significant differences in children's age, parents' education level, the gender division, the percentage of monolinguals, or children attending the daycare in their dominant language between the intervention and control groups (Table 1). In addition to Swedish and Finnish, the children spoke also other languages at home (6 English; 3 Spanish; 2 Arabic; 1 Vietnamese, Somali, Lithuanian, Danish, Lebanese, Slovenian, Greek, Chinese). The children were defined as multilingual if their caregivers reported that their child spoke also or predominately a language other than Swedish at home. Only three families advised that their child's strongest language was other than Swedish or Finnish. Regarding mono- or multilingualism, preliminary analyses showed no significant main effects or interactions with time or group on any SDQ measures. The main effect of language status on verbal fluency was significant, as expected, but the interaction with time or group was not. Thus, the language status was left out of the final analyses.

During the 12-week follow-up, the reading sessions were of similar length (SAGA: $M = 18.6$ min, $SD = 4.2$; control: $M = 18.4$, $SD = 7.5$) in the SAGA and control groups. On average, there were more reading sessions in the SAGA groups (per group) than in the control groups ($M = 96.7$, $SD = 27.3$; $M = 68.6$, $SD = 20.3$, respectively), but the number of children attending each reading session was on average smaller in the SAGA group (SAGA: $M = 5.4$, $SD = 1.1$; Control: $M = 12.1$, $SD = 3.8$, respectively), suggesting that the control children may have received as many reading sessions as SAGA children, only in bigger groups.

3.1 The effects of SAGA intervention on social−emotional development

The intervention had a significant interaction with time when predicting Prosocial behavior [$F(1,189) = 13.316$, $p < 0.001$]. Between the pre-test and follow-up-test, the children in the

TABLE 1 The descriptive statistics for children in both groups.

	SAGA group ($n = 104$) Mean (SD)	Control group ($n = 92$) Mean (SD)	Group comparisons
Gender	Girls 52	Girls 42	$p = 0.587$
Age (months at baseline)	55.5 (10.0)	57.8 (8.9)	$p = 0.087$
Parental education – highest of either parent (n)			$p = 0.093$
Up to secondary level education	9	4	
Bachelor's degree	34	19	
Master's degree	47	52	
Licentiate or doctoral degree	11	15	
Language background[1]	Monolinguals 14	Monolinguals 19	$p = 0.176$
ECEC language (Swedish)	Dominant 74	Dominant 61	$p = 0.345$
Scores before the Intervention			
SDQ			
Internalizing	0.40 (0.39)	0.30 (0.31)	$p = 0.043$
Externalizing	0.62 (0.46)	0.53 (0.43)	$p = 0.177$
Prosocial behavior	1.15 (0.51)	1.45 (0.44)	$p < 0.001$
Verbal fluency	13.42 (7.01)	12.73 (5.76)	$p = 0.464$
Scores after the Intervention			
SDQ			
Internalizing	0.30 (0.35)	0.25 (0.29)	$p = 0.247$
Externalizing	0.45 (0.42)	0.39 (0.38)	$p = 0.315$
Prosocial behavior	1.35 (0.53)	1.46 (0.43)	$p = 0.116$
Verbal fluency	16.57 (6.85)	14.87 (6.33)	$p = 0.080$

The group differences were inspected with Pearson's chi-squared test, Independent-samples t-test, or when appropriate, Independent-samples Mann–Whitney U Test. [1]n(SAGA) = 102, n(control) = 90.

SAGA group improved in Prosocial behavior ($p < 0.001$, $f^2 = 0.211$[1]), whereas the control group did not ($p = 0.907$). No such interaction was found on Internalizing, Externalizing, or Verbal fluency (Table 2).

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1   Cohen's $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ indicate small, medium, and large effect sizes, respectively (Cohen, 2013, PP. 413—414).

TABLE 2 All the main effects and interactions for the assessments.

	Coefficient	Std. error	df	t	p	95% CI	Post hoc
Prosocial behavior							
Fixed effects							
Intercept	0.51	0.18	190.72	2.83	0.01	0.15, 0.87	
Group	0.08	0.06	259.02	1.20	0.23	−0.05, 0.20	
Time	−0.20	0.04	189.00	−5.44	<0.001	−0.27, −0.12	T2 > T1***
Gender	−0.22	0.06	187.00	−3.84	<0.001	−0.34, −0.11	Girls > boys***
Age	0.02	0.00	187.00	5.53	<0.001	0.01, 0.02	Older > younger***
Group*time	0.19	0.05	189.00	3.65	<0.001	0.09, 0.30	SAGA: T2 > T1***
Random effects							
Participant	0.13	0.02	Wald Z = 7.55		<0.001	0.10, 0.17	
Internalizing							
Fixed effects							
Intercept	0.88	0.15	123.40	6.00	<0.001	0.59, 1.17	
Group	−0.03	0.09	15.64	−0.38	0.71	−0.22, 0.15	
Time	0.09	0.02	189.00	4.26	<0.001	0.05, 0.13	T1 > T2***
Gender	0.05	0.04	176.99	1.41	0.16	−0.02, 0.13	
Age	−0.01	0.00	178.65	−4.51	<0.001	−0.02, −0.01	Younger > older***
Group*time	−0.03	0.03	189.00	−0.99	0.32	−0.09, 0.03	
Random effects							
Participant	0.05	0.01	Wald Z = 7.66		<0.001	0.04, 0.07	
ECEC group	0.02	0.01	Wald Z = 2.12		0.03	0.01, 0.06	
Externalizing							
Fixed effects							
Intercept	1.03	0.17	189.29	6.07	<0.001	0.70, 1.37	
Group	−0.06	0.06	232.32	−0.96	0.34	−0.17, 0.06	
Time	0.16	0.03	189.00	6.09	<0.001	0.11, 0.21	T1 > T2***
Gender	0.15	0.05	187.00	2.76	0.01	0.04, 0.26	Boys > girls**
Age	−0.01	0.00	187.00	−4.01	<0.001	−0.02, −0.01	Younger > older***
Group*time	−0.02	0.04	189.00	−0.64	0.52	−0.10, 0.05	
Random effects							
Participant	0.12	0.01	Wald Z = 8.39		<0.001	0.10, 0.16	
Verbal fluency							
Fixed effects							
Intercept	−8.79	2.12	193.19	−4.14	<0.001	−12.97, −4.61	
Group	−2.13	0.75	253.60	−2.85	0.01	−3.60, −0.65	SAGA > Control**
Time	−2.71	0.42	181.58	−6.48	<0.001	−3.54, −1.89	T2 > T1***
Gender	−0.50	0.68	185.43	−0.74	0.46	−1.84, 0.84	
Age	0.45	0.04	187.38	12.55	<0.001	0.38, 0.52	Older > younger***
Group*time	0.46	0.60	179.00	0.77	0.44	−0.72, 1.65	
Random effects							
Participant	17.33	2.28	Wald Z = 7.60		<0.001	13.39, 22.42	

CI, confidence interval. ***p < 0.001, **p < 0.010.

	PG_L Mean (SD)		PG_H Mean (SD)	
	Before	After	Before	After
SAGA	0.53 (0.26)	0.88 (0.44)	1.40 (0.35)	1.53 (0.45)
Control	0.58 (0.29)	0.76 (0.40)	1.54 (0.35)	1.53 (0.36)

3.2 The development of children with challenges in prosocial behavior

Regarding prosocial behavior, previous literature has suggested that children originally showing lower scores for these skills may benefit more from interventions than their higher-scoring peers (Flook et al., 2015; Schellenberg et al., 2015). Thus, the development of the higher and lower scoring children was inspected, separately within intervention and control groups. The children were divided into two groups regarding prosocial behavior: PG_L representing the lowest quartile in the baseline scores (0.8 points or less, SAGA: $n=29$, Control: $n=9$) and PG_H representing the other three quartiles (1.0–2.0 points, SAGA: $n=75$, Control: $n=83$). This division corresponds to the 90th percentile cut-off point (raw score of 4 points) among Finnish 4- to 9-year-old children (Borg et al., 2014). Due to the imbalance in group sizes, the Mann–Whitney U test was used in the *post hoc* analysis.

Within SAGA groups, PG_L showed larger gains compared to PG_H [$F(1,102)=6.097$; $p=0.015$], although both groups improved between the pre-test and follow-up-test [PG_L: $p<0.001$, $f^2=0.437$; PG_H: $p=0.002$, $f^2=0.091$, respectively]. Within the Control group, the change in Prosocial scores was not significant in either PG_L and PG_H, and further, there was no difference between the change in higher or lower scoring group [$F(1,90)=2.389$; $p=0.126$]. The scores for higher and lower scoring groups are presented in Table 3 and all results are shown in Table 4. Figure 2 displays the change over time in the groups inspected.

3.3 The development of mentalization capacities of the staff

The internal consistencies as measured by Cronbach's alpha for the three MentS factors were satisfactory ($\alpha=0.765$–0.842). There was a significant interaction between time and group for the capacity to child-related mentalizing (MentS-O) and the motivation to mentalize (MentS-M) [$F(1,46)=5.677$, $p=0.021$; $F(1,46)=6.620$, $p=0.013$, respectively]. Between the pre-test and follow-up-test, the scores for these increased only in the group participating in SAGA intervention [MentS-O: $p=0.010$, $f^2=0.178$; MentS-M: $p=0.035$, $f^2=0.186$, respectively]. No other significant main effects or interactions were found. The mean scores and the main effects and interactions for MentS are displayed in Tables 5, 6.

4 Discussion

We studied the effects of a mentalizing-based SAGA reading intervention on the development of children's prosocial skills, verbal skills, and internalization and externalization problems. In addition, we investigated the effects of the intervention on ECEC staff's mentalization capacity. Our results confirmed our first hypothesis but not the second: the intervention improved children's prosocial skills but we were unable to replicate the findings of the first trial (Martikainen et al., 2023) regarding internalizing and externalizing problems. Additionally, we inspected the change in the prosocial skills in children with and without challenges in prosocial behavior and found support for our third hypothesis: the sub-group of children in SAGA group, who initially showed lower skills in prosocial behavior, demonstrated larger gains due to intervention than their higher-scoring peers. Furthermore, our results supported our fourth hypothesis, as the mentalization capacity seemed to improve in ECEC staff who participated and contributed to the intervention, compared to their peers in the control group. Our fifth hypothesis about intervention supporting verbal development in a multilingual group was not supported by our results.

Based on ECEC staff's SDQ assessments, children who participated in SAGA intervention's SSBR sessions, showed an increase in one of the measures of their social–emotional development, unlike their peers in the control group. Although now only showing a medium rather than a large effect size, this result is in line with the first trial (Martikainen et al., 2023), in which the SAGA intervention model was compared with both a control group and another intervention aiming to strengthen social–emotional development. In that study, both interventions supported children's prosocial behavior more than regular daycare routines did, but SAGA showed larger gains. As the SAGA intervention was conducted (in both studies) by ECEC staff and not by researchers, the results provide encouragement for the implementation of such methods in ECEC practices. Blewitt et al. (2018) concluded in their meta-analysis that the most effective interventions seem to rely on researchers or other experts, but our studies suggest that it is possible to train the staff to conduct reading interventions successfully. Regarding SAGA and other similar models, only a few hours' training and availability of stories with dialog cards might be enough for the ECEC staff to be able to carry out reading session accompanied with mentalizing discussions and adopt the model in the kindergarten routines.

In contrast to what we hypothesized, the SAGA intervention did not decrease the internalizing and externalizing problems in children. The ability to process internalizing and externalizing problems is a demanding task for individuals, irrespective of age and may require a longer than a 12-week intervention. However, this result contradicts our previous findings (Martikainen et al., 2023) that showed the effectiveness of SAGA intervention regarding these problems. One obvious difference between the samples was language background: in Martikainen et al. (2023), 88% of the participants were monolingual children (Finnish speakers), attending ECEC in their native language. In contrast, only 16.8% of the children in our study were monolingual, attending ECEC in their native language (Swedish). Consequently, most of the children in the present study were multilingual, and for some of them, the stories might have been more challenging language-wise. The monolingual children in our study belong to a dwindling minority, and this often leads to the inability to use the child's native language outside home or the ECEC center, and limited access to rich linguistic stimulation in varying environments, affecting children's language development and overall learning (Brunell, 1991). This might have affected the profoundness of the discussions in the present

TABLE 4 The main effects and interactions for higher and lower scoring children in prosocial behavior within SAGA and control groups.

	Coefficient	Std. error	df	t	p	95% CI	Post hoc
SAGA							
Fixed effects							
Intercept	1.53	0.05	159.65	33.83	<0.001	1.44, 1.62	
Time	−0.14	0.04	102.00	−3.15	0.002	−0.23, −0.05	T2 > T1***
Prosocial group	−0.66	0.09	159.65	−7.66	<0.001	−0.83, −0.49	PG_H > PG_L***
Prosocial group*time	−0.21	0.08	102.00	−2.47	0.015	−0.37, −0.04	Change over time: PG_L > PG_H*
Random effects							
Participant	0.08	0.02	Wald Z = 4.71		<0.001	0.05, 0.12	
Control							
Fixed effects							
Intercept	1.53	0.04	139.68	39.44	<0.001	1.46, 1.61	
Time	0.01	0.04	90.00	0.19	0.847	−0.07, 0.08	
Prosocial group	−0.78	0.12	139.68	−6.26	<0.001	−1.03, −0.53	T1 > T2***
Prosocial group*time	−0.19	0.12	90.00	−1.55	0.126	−0.42, 0.05	
Random effects							
Participant	0.07	0.02	Wald Z = 4.49		<0.001	0.04, 0.10	

CI, confidence interval. PG_H = children scoring higher in Prosocial behavior, PG_L = children scoring lower in Prosocial behavior. ***p < 0.001, *p < 0.050.

study. Although no significant difference emerged between the mono- and multilingual children regarding the assessments, the language status might have affected our results at a group level. Furthermore, even though the lack of qualified ECEC staff is a general problem in Finland, the Swedish speaking ECEC centers suffer from this more than ECEC centers for Finnish speakers (Kuntaliitto, 2022). In the present study, the percentage of staff with university degree in groups conducting SAGA intervention was slightly lower than in the first trial, although the difference did not reach statistical significance. Training for SAGA model was offered for all members of staff, but it may be possible that the individuals with higher education were better able to internalize the aspects of the model, and this would have led to SAGA intervention showing more promise in decreasing internalizing and externalizing problems in Finnish speaking ECEC centers. Furthermore, the participating children in this study were younger (mean age was 4.6 years in the intervention group) as compared to the first trial (mean age was 5.9 years in the intervention group). Previous results have shown that older children benefit slightly more from the interventions aimed at supporting social–emotional development. Blewitt et al. (2018) hypothesized that older children with more mature executive functioning might be better equipped to benefit from the interventions. Future studies are needed to verify this hypothesis, and to investigate for example, whether creating tailored versions of the intervention for different age groups could offer a means to provide better support to younger children as well.

As one of the hypotheses, we looked at the children's language development. Previous studies (Hargrave and Sénéchal, 2000; Gonzalez et al., 2014; Simsek and Erdogan, 2015) have suggested that SSBR support children's language development but results from both the first and second trials did not confirm this. As reading sessions are part of all the ECEC centers' curricula, the children in the control

group attended regular reading sessions as well, and were probably similarly exposed to language and, e.g., new words as were the children in SAGA group. However, we measured the knowledge of words in only two categories (animals, food/beverages). If the test had focused on, e.g., emotion words, the results may have been different. Moreover, the intervention lasted only 12 weeks, whereas to improve language development, the SAGA model should probably be introduced as a weekly practice session for a longer period.

Our third hypothesis was that SAGA intervention would improve prosocial behavior especially in those children who originally showed low prosocial skills. The results support our hypothesis and are in line with previous studies (Flook et al., 2015; Schellenberg et al., 2015) showing stronger effects of interventions on those children whose prosocial skills are lower on the baseline. Our analyses revealed that even though both higher and lower scoring groups improved their prosocial skills, there was a difference in the effect sizes for these improvements. Whereas SAGA intervention showed only small effects for the higher scoring children, the effect size was large for the children scoring originally lower than the threshold for normal variation. As such, it is promising that SAGA appears to have potential to support not only all children's social–emotional development, but also to have an even stronger impact on children with more difficulties in adopting prosocial behavior. Additionally, from the inclusion perspective, it is of utmost importance to provide children with such support that does not separate them into groups of high- and low-achievers. In this way, the children do not learn to see themselves or their peers as "better" or "worse" compared to others.

As the mentalization capacity of the staff was measured by self-assessment, it is unclear if the replies reflect the true ability to mentalize or one's own—possibly unrealistic—perception of it. The participants in both groups gave themselves quite high scores on

FIGURE 2
Change over time in groups representing the lower and the higher baseline scores. The bars represent 95% confidence intervals. *p < 0.050.
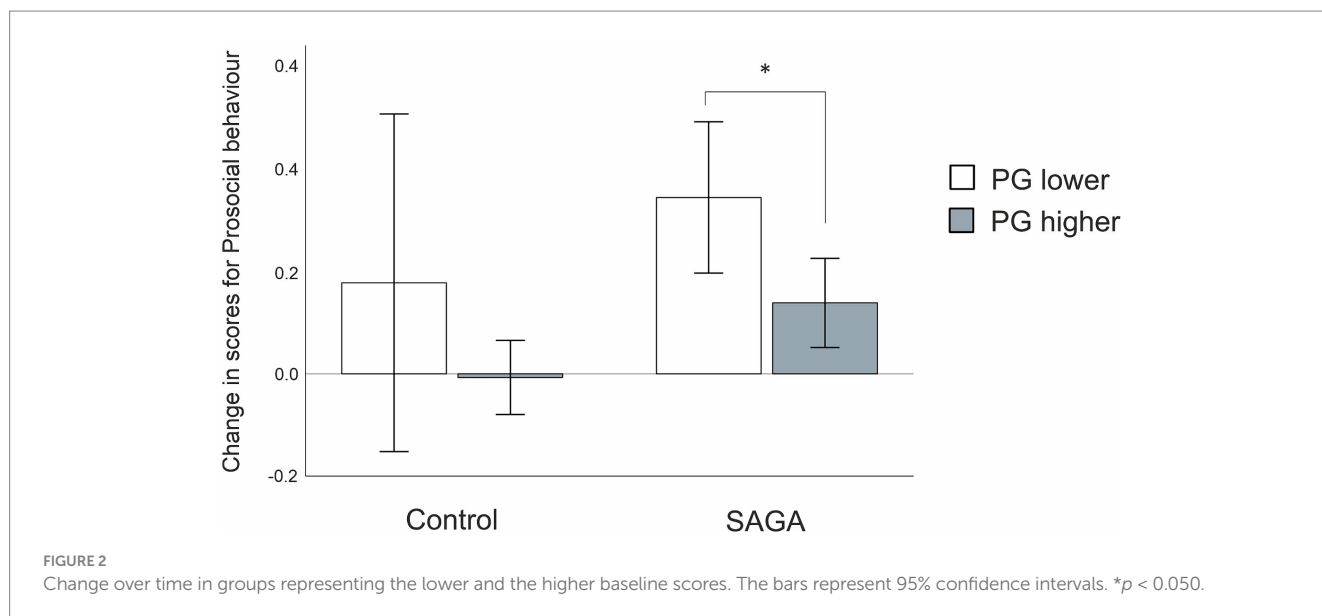
TABLE 5 The mean scores and standard deviations for the three MentS factors, averaged over the 10 (MentS-Others, MentS-Motivation) or 8 (MentS-Self) items.

	All (N = 48)		SAGA (n = 25)		Control (n = 23)	
	Before	After	Before	After	Before	After
MentS-Self	1.96 (0.68)	1.95 (0.71)	1.99 (0.65)	2.00 (0.65)	1.93 (0.72)	1.89 (0.78)
MentS-Others	4.30 (0.46)	4.36 (0.41)	4.22 (0.49)	4.36 (0.43)	4.40 (0.40)	4.36 (0.39)
MentS-Motivation	4.53 (0.41)	4.54 (0.46)	4.50 (0.46)	4.61 (0.45)	4.56 (0.35)	4.47 (0.47)

mentalization skills even at the beginning of the follow-up, and indeed, it could be expected that the individuals seeking to work with children are inclined to have a better than average capacity to mentalize about others and to be more motivated to mentalize. At least, this seems to be the case with first-year clinical psychology students compared to engineering students in Norway (Fagerbakk et al., 2023), and might also apply to our participants. Another factor influencing the mentalization skills of early education staff might be that they are continuously exposed to situations in which they are likely to use their mentalization skills, especially if they are aware of the importance of mentalization.

However, the ability to mentalize other people's minds and the motivation to mentalize seemed to increase moderately in ECEC staff in the SAGA intervention group. This might be due to them engaging in promoting conversations with the children about beliefs, motives, and emotions of the figures in the stories, and thus, being able to keep the focus on inner mental states rather than on the behavioral level. Such practices are likely to enhance mentalization skills.

As discussed, the self-reported improvement in mentalizing capacity within the staff participating in SAGA intervention might be due to their heightened sensitivity for the subject, or then it could merely be due to the need to show development even if it has not really occurred. Thus, regarding the study, we cannot be sure if the increase in the capacity to mentalize about others has really improved in the group. However, the increase in the motivation to mentalize suggests that the staff members are willing to focus on their mentalizing capacity in future.

4.1 The limitations

The present study has some obvious limitations. Both the intervention and the assessments on children were conducted by the same people, who were not blinded to the study design. This is a common problem within educational research (Blewitt et al., 2021), and stems partly from the lack of resources for extensive testing or observing, and partly from the lack of age-appropriate tests for prosocial skills for small children. In our case, the study was carried out during the COVID-19 pandemic, and thus assessments were chosen so that it was possible to conduct the study even if the research assistants would be denied access to the centers.

The same limitation applies to the MentS assessment: the ECEC staff were not blinded to the study design. In addition, as discussed above, the staff members might be tempted to reply to questionnaire items in a socially acceptable way instead of engaging in critical self-assessment. However, even if the mentalizing skills were not realistically self-evaluated, the increase in motivation to mentalize seen in only SAGA group is an important result, having long-term effects on ECEC staff's capacity to mentalize when working with children.

Regarding the language measures, we did not find any effect of the intervention on the children's language development. However, the methods used in this study to measure language skills were limited. Further studies with more precise measures including an assessment of the children's emotional vocabulary should be conducted to elaborate on these findings.

TABLE 6 The main effects and interactions for MentS factors.

	Coefficient	Std. error	df	t	p	95% CI	Post hoc
MentS-Self							
Fixed effects							
Intercept	2.00	0.14	57.59	14.28	<0.001	1.72, 2.27	
Time	−0.01	0.09	46.00	−0.05	0.96	−0.19, 0.18	
Intervention	−0.10	0.20	57.59	−0.51	0.61	−0.51, 0.30	
Intervention*Time	0.05	0.14	46.00	0.36	0.72	−0.23, 0.32	
Random effects							
Participant	0.38	0.09	Wald Z = 4.15		<0.001	0.24, 0.61	
MentS-Others							
Fixed effects							
Intercept	4.36	0.09	55.72	50.58	<0.001	4.19, 4.53	
Time	−0.14	0.05	46.00	−2.69	0.01	−0.25, −0.04	ns
Intervention	0.00	0.12	55.72	−0.03	0.98	−0.25, 0.25	
Intervention*Time	0.19	0.08	46.00	2.42	0.02	0.03, 0.34	SAGA: T2 > T1*
Random effects							
Participant	0.15	0.04	Wald Z = 4.26		<0.001	0.09, 0.24	
MentS-Motivation							
Fixed effects							
Intercept	4.61	0.09	55.36	52.90	<0.001	4.44, 4.79	
Time	−0.12	0.05	46.00	−2.18	0.04	−0.22, −0.01	ns
Intervention	−0.14	0.13	55.36	−1.13	0.26	−0.39, 0.11	
Intervention*Time	0.20	0.08	46.00	2.64	0.01	0.05, 0.36	SAGA: T2 > T1*
Random effects							
Participant	0.15	0.04	Wald Z = 4.28		<0.001	0.10, 0.24	

CI, confidence interval. *$p < 0.05$.

It is also notable that the education level of the participating families was high, which may compromise the generalizability of the findings. Further research should be conducted including children from more varied backgrounds to understand better whether the children's background has an impact on the results.

Yet another limitation of the study is the lack of an active control group. However, we had an active comparison group in the first trial (Martikainen et al., 2023), and the results showed that even though both interventions affected children's social–emotional skills, SAGA was more effective. Regarding the amount of reading in ECEC centers, it is unclear if there is a difference in participation in reading sessions between SAGA and control group. The average number of reading sessions in ECEC groups was higher in SAGA, but the size of the child groups in them was lower. This suggests that the children in the control group may have received a similar number of reading sessions but attended them in bigger groups. This suggests that the impact might stem from the small-group discussions inspired by the stories and guided by the ECEC staff. Whether the training of the staff and the materials given to them by SAGA project were crucial to the found improvement in children should also be further studied.

4.2 Conclusion and future work

In our study, we found that according to ECEC staff's assessments, a 12-week intervention based on the SAGA model improved children's prosocial behavior, especially for children with more problems in this area, and the ECEC staff's mentalization capacity. However, the intervention did not have an impact on children's internalizing and externalizing problems, or word fluency. These results suggest that SSBR sessions in small groups, combined with mentalizing discussions may support children's social–emotional development, or more specifically, prosocial behavior. In addition, the training and conducting of SAGA intervention appeared to support ECEC staff's interest in mentalizing in the present study. Although children's prosocial skills would be enhanced by a book reading interactions in small groups in general, and not by SAGA model in particular, the strength of the model is that it provides a structure and materials that appear to be easily adopted by the ECEC staff and may be implemented in their daily routines with only few hours' training.

In future, a longer follow-up period is needed to investigate if the ECEC staff maintains the model and if the impact of the SAGA reading sessions remains in the long run. In addition, we need to

explore further the conditions of learning for different groups of minority language children in ECEC and deepen our understanding of the impact of different intersections of belonging to a minority, and the impact of these on learning and development.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by the Research Ethics Committee in the Humanities and Social and Behavioural Sciences of University of Helsinki, Finland. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

TL: Conceptualization, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing, Data curation. SM: Investigation, Writing – review & editing, Methodology. FB: Investigation, Writing – review & editing, Data curation. MK: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Writing – review & editing.

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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