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Early childhood education professionals' mentalization: a pilot study

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ABSTRACT

The present study applied Video Enhanced Reflective Practice (VERP) to promote and assess Finnish professionals' interactional competence by means of stimulated recall during three group-based shared review discussions. A VERP trainer guided the professionals to reflect on children's, their own, and colleagues' actions and mental states based on video-recorded interactions in early childhood education classrooms. Self-reports on attuned interaction and guidance were collected before and after the in-service training. A coding scheme was developed to assess the target, type, and richness of mental state utterances ($N = 787$) produced during the VERP training. The professionals equally discussed children's and adults' mental states. They talked more frequently about motivational states when referring to children and cognitive states when referring to themselves and colleagues. The more attuned the professionals perceived their interaction with the children was before training, the more frequently they referred to their own or colleagues' mental states observed during the group discussions. Our study extends assessment of mental states and provides guidelines for future group-based video-stimulated recall training for early childhood education professionals.

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Early childhood education; mentalization; interaction skills; in-service training; Video Enhanced Reflective Practice (VERP)

Introduction

Reflection in educational research and practice involves thinking processes and factors, such as the content, methods, and form, related to teaching interactions (see Lee 2005). Within the field of developmental psychology, the term 'mentalization' refers to adults' competence to reflect on their own and others' mental states, such as thoughts, desires, and feelings (Meins 1997; Sharp and Fonagy 2008). Several reviews have shown that the mentalizing ability to see young children as individuals with their own minds is positively related to parental sensitivity during interactions with their child and to children's development regarding, for example, attachment security, language acquisition, and theory of mind (Aldrich, Chen, and Alfieri 2021; McMahon and Bernier 2017; Zeegers et al. 2017). There is also evidence that mentalization is

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related to how professionals in early childhood education (ECE) interact with children (Colonna et al. 2017; Degotardi and Sweller 2012; Helmerhorst, Colonna, and Fukkink 2019) and children's theory of mind (Mata López, Santelices Álvarez, and Verges Gomez 2020). Therefore, focusing on mental states during interaction seems to be an important aspect of ECE professionals' competence, which could contribute to children's development.

The present video-based Video Enhanced Reflective Practice (VERP) intervention study aimed at promoting professionals' interactional sensitivity by focusing on mentalization. To our knowledge, such in-service training studies are still rare in the ECE context. Fitting in with the widely used format of professional development (Buysse, Winton, and Rous 2009), we created a new assessment method for coding the frequency and content of mental state utterances produced during group-based shared review discussions.

Mental state utterances during interactions

Traditionally, reflective practice in the educational context focuses mainly on behavior, whereas mentalization goes beyond visible actions to understand how mind-related processes influence behavior (Stacks, Wong, and Dykehouse 2013, see also Korthagen 2017; Zeegers et al. 2017). Mind-related constructs, such as reflective functioning (Sharp and Fonagy 2008; Slade 2005), insightfulness (Koren-Karie et al. 2002), or mind-mindedness (Meins 1997), were originally created in parenting research to refer to mothers' reflections on and speech about mental states when interpreting the child's behavior during interactions (for an overview, see Sharp and Fonagy 2008; Zeegers et al. 2017). Besides explicit references to mental states, implicit mentalization may occur in non-verbal actions, as indicated, for example, when one mirrors another's emotional expression. Mentalization is conceived as a relational construct that develops in interactions by observing others' behaviors and reflecting on feelings and thoughts more or less consciously (Fonagy et al. 1991; Meins, Fernyhough, and Harris-Waller 2014).

Researchers have applied different assessment methods for collecting data and coding parents' and ECE professionals' mental state utterances (i.e. explicit mentalization). In observational research, mental state talk is usually analyzed from video-recorded adult – child interactions (Meins and Fernyhough 2015; Sheng, Dong, and Hu 2021). During interviews, the adults are asked to describe the child (Meins, Fernyhough, and Harris-Waller 2014), whereas in stimulated recall research, video clips of interactions are used as a trigger for adults' reflections on the child's and their own mental states (Degotardi and Sweller 2012; Koren-Karie et al. 2002). The coding schemes of audio- or video-recorded and transcribed data on parents and ECE professionals tap the same types of mental states, such as cognition, perception, emotion and desire, interest, and motivation (King and La Paro 2015; Meins and Fernyhough 2015; Ruffman, Slade, and Crowe 2002).

There is an increased interest in understanding and enhancing professional development in the ECE context. Professionals' mental state utterances assessed from video-recorded interactions with one or more children cover 3% to 22% of their overall talk (Colonna et al. 2017; Degotardi and Sweller 2012; Farkas et al. 2017; Frampton, Perlman, and Jenkins 2009; Helmerhorst, Colonna, and Fukkink 2019; King and La Paro 2015). Interestingly, Degotardi and Sweller (2012) reported that ECE professionals used fewer mental state utterances (19%) when they talked to a nominated child during interaction

than when they later explained the child's video-recorded behavior (55%), which is in concordance with the findings of parental studies (McMahon et al. 2016).

Regarding the type of mental state talk, Australian and Chinese ECE professionals' utterances were most frequently related to motivation during play interaction with children 0–2 years old (Degotardi, Han, and Hu 2021; see also Degotardi and Sweller 2012; Sheng, Dong, and Hu 2021). Some cultural differences were detected, as Australian professionals used more diverse mental state talk than their Chinese colleagues did. Cognition talk seems more common with older children (see also Degotardi, Han, and Hu 2021). References to cognition were most frequent during a short play interaction with two randomly selected children in a Dutch sample (Colonnesi et al. 2017), whereas references to perception were most common with larger groups of children (3–4 years old) in a United States sample (King and La Paro 2015). It seems that irrespective of culture, child age, or group size, emotion talk is sparse among ECE professionals.

Some evidence from King and La Paro (2015) suggests that ECE professionals were more likely to talk about cognitive, perceptual, or motivational states when they referred to children and to themselves when talking about emotional states during classroom interactions. In a cross-cultural study by Degotardi, Han, and Hu (2021), Chinese professionals directed cognition talk most frequently to children (e.g. *Do you remember when . . .*) compared with Australian professionals, who more frequently referred to their own cognition (e.g. *I think it is in here*). When ECE professionals discuss video-recorded classroom interaction, they also refer to their colleagues' actions and mental states (Cherrington and Loveridge 2014). Therefore, it seems relevant during group-based discussions to recognize the target of the mental state talk.

Mentalization as a tool and outcome in interventions

Adults who use more mental state utterances display higher interactional sensitivity with children (for reviews on parents, see McMahon and Bernier 2017; Zeegers et al. 2017), suggesting that mentalization and interaction could reciprocally influence each other. Among ECE professionals, the frequent use of mental state utterances has been positively related to interactional sensitivity, cognitive stimulation (Degotardi and Sweller 2012; Helmerhorst, Colonnesi, and Fukkink 2019), and respect for children's autonomy (Colonnesi et al. 2017). According to Korthagen (2017), professionals must reflect on their own and children's behavior and mental actions to improve their teaching interaction. Only a limited number of interventions have applied reflective discussions in the ECE context, although the parental studies show that the tendency to focus on mental states and quality of interaction can be enhanced through interventions utilizing for example video-stimulated reflection (Huber, McMahon, and Sweller 2015; Riva Crugnola et al. 2019; see also Lo and Wong 2020; Mortensen and Mastergeorge 2014 for meta-analyses).

Research on the Video Interaction Guidance (VIG) intervention suggests that conscious reflection on mental states is one of the key mechanisms for improving adults' interactional competence (Doria et al. 2014). After a VERP, a VIG-based intervention using video-stimulated reflection and discussion, ECE professionals' observed sensitive responsivity and verbal stimulation during interactions improved compared with their colleagues in a control group (Fukkink and Tavecchio 2010). Similarly, Spilt et al. (2012) applied video recordings of interactions to facilitate professionals' reflection on their relational

representations and emotions experienced with two behaviorally at-risk kindergartners. The professionals' perceived closeness and observed sensitivity during interactions improved after reflective questions and video-stimulated discussions compared with an alternative approach for colleagues who were instructed to focus on behavioral change in interactions with the at-risk kindergartners.

There is a need for well-designed intervention studies targeting quality of interaction in ECE (Werner et al. 2016). High-quality interventions combining at least two training components, such as multiple sessions and individual support, have been successful in enhancing ECE professionals' pedagogical interactions with children (Egert, Dederer, and Fukkink 2020). Recently, researchers have obtained promising results from simultaneously training several staff members through reflection on their video-recorded classroom interactions instead of individual-based training (Harkoma et al. 2021; Soni 2021).

Present study

This study aims to enhance ECE professionals' sensitivity in interaction by means of video-stimulated reflection and developing a coding scheme for assessing and describing mental state talk in the ECE team context. The VERP intervention study was conducted in a North European context. In Finland, the Ministry of Education and Culture is in charge of planning, guiding, and monitoring high-quality ECE at the national level. Guidelines for implementing research-based pedagogy at the local level are described in the National Core Curriculum for ECE (FNAE 2019). Finland offers an excellent context to examine the potential of group-based VERP in day care centers because ECE professionals work in teams in classrooms. Four children under the age of three and seven children above the age of three may be under the responsibility of each team member. At least one team member is an ECE teacher who must hold a bachelor's degree in education. In addition to the pedagogical leader, the team includes ECE caregivers with a vocational degree and, if necessary, additional staff. Children with special needs and immigrant backgrounds normally attend mainstream ECE to promote an inclusive pedagogy in line with national education requirements.

To meet the research aim, the following questions are addressed:

- (1) What is the frequency and content of ECE professionals' mental state talk? Are there differences in the target, type, and richness of the utterances produced during the VERP shared review discussions?
- (2) Is there a relationship between the mental state utterances produced during the shared review discussions and ECE professionals' self-reported sensitivity in interactions before and after VERP training?

Method

Participants and procedure

Two ECE teams participated in the small-scale pilot intervention study conducted at two Finnish day care centers during spring and autumn 2019. Both teams of three members represented mainstream classrooms including children with varied developmental and

cultural backgrounds. There were 19 children aged 3–5 years in team A and 18 children aged 1–5 years in team B. In team A, the teacher had a master's degree in education without ECE teacher qualification, and in team B, the teacher had a bachelor's degree in education with ECE teacher qualification. The other team members had a vocational degree in upper secondary school with ECE caregiver qualification or an assistant qualification. The professionals had worked in ECE settings from five months to eight years in team A and from four to 24 years in team B.

Recruitment began by sending an information letter to every municipal day care center of a large southern Finnish city. Professionals working together on the same ECE team were encouraged to participate in the study if they were committed to enhance their interaction skills with the children, especially those they had difficulties interacting with. After enrollment, the ECE teachers were contacted by phone to ensure that their team fulfilled the requirements described above.

Informed consent was collected from all team members and the guardians of the children who were shown on video recordings during shared review discussions. Before the VERP training, each member was individually interviewed about their background and motives for participating, and after the intervention, they were interviewed about their training experiences.

The VERP training

The VERP training (Kennedy and Landor 2015) is based on theoretical concepts of intersubjectivity (Trevarthen 1979) and scaffolding (Wood, Bruner, and Ross 1976). It was originally developed and implemented as VIG for improving sensitive interactions in high-risk family settings. The aim of VERP is to promote professionals' attuned adult-child interaction and guidance (see Appendix 1 in supplemental materials). The principle of attuned interaction occurs when the adult and the child actively share the same focus of attention as they reciprocally communicate and negotiate meaning and intention. During guidance, the adult mediates the child's learning by offering suitable amounts of high-quality support when needed. The qualified trainer facilitates professionals' development and behaves in line with the two basic principles. To explore the effectiveness of group-based VERP in promoting mentalization and enhancing team members' interactions in inclusive classrooms, the intervention was implemented in groups composed of three professionals working together on the same ECE team. The training comprised three video recordings (from 10 to 36 minutes) of each team member's everyday interactions with children and three video-recorded shared review discussions. In keeping with the strength-based approach, the trainer selected video clips with an emphasis on successful episodes, which were used as stimulation for reflections during the shared reviews to actualize new insight and behavior. The training procedure was carried out over six to seven weeks. To ensure intervention fidelity, the trainer (the first author) was counseled by a VERP supervisor.

Before each shared review, the trainer visited the day care centers and recorded pedagogical activities including one to two team members' interactions with two to eight children. Various activities with mixed groups of children were recorded: free or adult-led play, board game playing, craft, circle time, lunch, and transitions. After the video recordings, the trainer selected two short video clips (altogether 1.5 minutes per

Table 1. Child- and adult-focused mental state utterances during shared reviews: mean rates per ten minutes.

	Time 1 <i>M (SD)</i> <i>Mdn (min-max)</i>	Time 2 <i>M (SD)</i> <i>Mdn (min-max)</i>	Time 3 <i>M (SD)</i> <i>Mdn (min-max)</i>
Child-focused			
Cognition	1.21 (0.78) 1.24 (0.17–2.45)	0.50 (0.27) 0.50 (0.14–0.86)	0.94 (0.57) 0.75 (0.38–1.94)
Emotion	0.47 (0.44) 0.38 (0.00–1.17)	0.67 (0.45) 0.50 (0.14–1.29)	0.77 (0.38) 0.81 (0.15–1.25)
Motivation	1.69 (0.67) 1.50 (0.83–2.64)	1.57 (0.51) 1.57 (1.00–2.14)	1.49 (0.83) 1.38 (0.50–2.84)
Total	3.38 (1.40) 3.87 (1.17–4.67)	2.74 (0.95) 2.64 (1.71–4.14)	3.20 (1.25) 3.50 (1.64–4.63)
Adult-focused			
Cognition	2.21 (0.57) 2.39 (1.50–2.83)	1.79 (0.53) 1.93 (0.86–2.29)	1.86 (0.70) 1.99 (0.88–2.69)
Emotion	0.65 (0.36) 0.72 (0.19–1.00)	0.45 (0.21) 0.50 (0.14–0.71)	0.62 (0.45) 0.75 (0.00–1.04)
Motivation	0.53 (0.31) 0.62 (0.00–0.83)	1.31 (0.76) 1.26 (0.43–2.14)	1.10 (0.54) 0.97 (0.50–1.94)
Total	3.40 (0.43) 3.45 (2.67–3.83)	3.55 (0.94) 3.86 (2.00–4.43)	3.58 (0.99) 3.91 (2.00–4.48)

team member) as an example of high-quality, successful interaction and pedagogy. If possible, the team member's objectives or wishes were also considered when selecting the clips.

For each team member, the shared review started by watching the video clip and hearing the target member's first impression of the clip. Subsequently, the participants rewatched the video clip, focusing on the moment-to-moment process of attuned interaction and guidance (Kennedy and Landor 2015). The trainer prompted the participants' reflection by asking what happened in the clip, what the children and the adults did, thought, felt, and aimed at, and asking for the reasons for the behavioral and mental actions. A set of 35 pictures with labels representing the same behavioral and mental actions as the self-report items on interaction skills (Appendix 1) were used to structure the discussions. The trainer also commented with the intention to share viewpoints and to relate the discussion to the principles of attuned interaction and guidance. Each video-recorded shared review discussion lasted around 70 minutes (range 60–80) with team A and 63 minutes (range 53–70) with team B. We controlled for the length of the discussions when comparing the frequencies of mental state utterances within and across three time points (see Tables 1 and 2).

Assessment of mental states

The data consisted of the three video-recorded shared review discussions (6 hours and 40 minutes in total for teams A and B), which were transcribed, pseudonymized, and read repeatedly during the development of the coding scheme (see Appendix 2 in supplemental materials).

To assess the total frequency and type of the ECE professionals' mental state utterances, we developed a coding scheme (see Appendix 2) based on existing coding systems. The unit of analysis was an utterance, typically a clause including a word-level

Table 2. Spearman correlations between child- and adult-focused mental state utterances during shared reviews.

Child-Focused	Adult-Focused		
	Cognition	Emotion	Motivation
Time 1			
Cognition	.543	-.116	-.371
Emotion	.600	.812*	-.829*
Motivation	.257	.725	-.143
Time 2			
Cognition	.638	-.348	-.203
Emotion	.265	-.735°	.794°
Motivation	.788°	-.788°	.667
Time 3			
Cognition	.486	-.200	.348
Emotion	-.543	.143	-.638
Motivation	.714	-.657	.812*

* $p < .05$, ° $p < .10$.

reference to a mental state. Repetition of a mental state was not double-coded except if the mental state reappeared in a different context. Multiple repetitions of phrases such as '*I think*' or '*In my opinion*' were interpreted as personal conversational patterns rather than reflections on one's own cognition (see, e.g. Ruffman, Slade, and Crowe 2002).

The coding was implemented in several stages. First, the professionals' talk about the children's (Degotardi and Sweller 2012; Meins and Fernyhough 2015), their own (King and La Paro 2015), or their colleagues' mental states and descriptions about behavioral indicators (Demers et al. 2010) were identified and categorized. The utterances were typically in the past or present tense (e.g. 'I was confused because ...', 'It is confusing to see ...'), indicating that the professionals were reflecting either on the mental state at the time of video-recorded interaction or their current mental state during the shared review discussion. Second, all child-, self-, and other-related utterances were coded in one of the four mental state type categories: 1) cognition, such as thinking, understanding, or information exchange; 2) perception, such as seeing, hearing, or other sensory experiences; 3) emotion, such as happiness or sadness; and 4) motivation, such as desires, needs, interests, or expectations. Perception-related talk was rare, and these utterances were included in the cognition category. When the professional was referring to the child's assumed mental state in the video clip: 'It is lovely when the child looks at the paper like [says in a childish voice] *I was supposed to do something*' without the child saying the italicized words, the utterance was coded as a child-focused cognition-related category.

Third, the major mental state types were further categorized as basic and enriched levels based on the richness of the behavioral description of the specific mental state, following the coding principle suggested by Demers et al. (2010). As shown in Appendix 2, a simple reference to a mental state without any example or explanation was coded as basic, whereas an enriched utterance included an example, explanation, or description of how the mental state was manifested in behavior. An extension of a team member's mental state utterance without new additional mental state talk (e.g. giving an example of the mental state) was coded as basic. An enriched utterance could include references to other mental states as richness; for example, the child-focused utterance coded as motivation-related (*interested*) also includes cognitive (*looks*) and emotional

(*emphatically*) states: 'CHILD 1 looks at CHILD 2 very *empathetically*, so that they are *interested* [in seeing] what happened to CHILD 2'. Some utterances included references to multiple targets' mental states (see [Appendix 2](#) for an example).

A second coder, blind to all other data, coded a random sample of 10% ($n = 78$) of the utterances. The coder had a master's degree in education and ECE teacher qualification. The training, implemented by the first author, included five sessions and independent work on several sets of utterances. The interrater reliabilities (Cohen's kappa, κ) for the target, type, and richness of mental state utterances were as follows: child (.95), self (.95), and other (1); cognition (.85), emotion (.84), and motivation (.79); basic (.90) and enriched (.90). The discrepancies were discussed to achieve a consensus on the codes.

Self-reports on interaction skills

Before and after the VERP intervention, the ECE professionals completed a self-report about their interaction skills reflecting the discrete behavioral and mental actions of the attuned interaction and guidance process (Kennedy and Landor 2015). The self-report was based on 40 items representing the discrete actions, which were the focus of the shared review discussions. The items were changed from the passive forms (e.g. 'Offering choices that the other can understand') into active subject and object forms (e.g. 'I offer choices that the child can understand'). Five items were deleted or combined because they were semantically similar to other items (e.g. 'Waiting' is included in 'I give space and time for the child'). Some items (e.g. 'Showing emotional warmth through intonation') were semantically concretized (e.g. 'I speak in a gentle voice'). The final self-report included 35 items (see [Appendix 1](#)), which were rated on a 5-point Likert scale ranging from 1 (*not true at all*) to 5 (*almost always true*). The posttest items were presented in reversed order as the pretest items.

Two summary scores were calculated. Attuned interaction was composed of four types of items (22 in total) on being attentive, encouraging initiatives, receiving initiatives, and developing attuned interactions (for examples, see [Appendix 1](#)). Guidance included two types of items (13 in total) on guiding and deepening discussion. Both attuned interaction (pretest $\alpha = .82$ and posttest $\alpha = .89$) and guidance (pretest $\alpha = .98$ and posttest $\alpha = .96$) showed high internal consistency. A higher score represented more attuned interaction and guidance in the ECE classroom as perceived by the professional.

Results

Mental state utterances

Altogether, the ECE professionals produced 332 cognition-related, 307 motivation-related, and 148 emotion-related utterances during the VERP intervention. According to the Friedman test, there were differences between the total frequencies of mental state types, $\chi^2(2) = 10.333$, $p = .006$. Post hoc pairwise comparisons using Dunn-Bonferroni correction revealed that the professionals referred more often to cognition than to emotion ($p = .004$). Next, the self- and other-focused utterances were combined into one adult-focused category due to the small number of utterances on other team members' mental states. The total frequencies

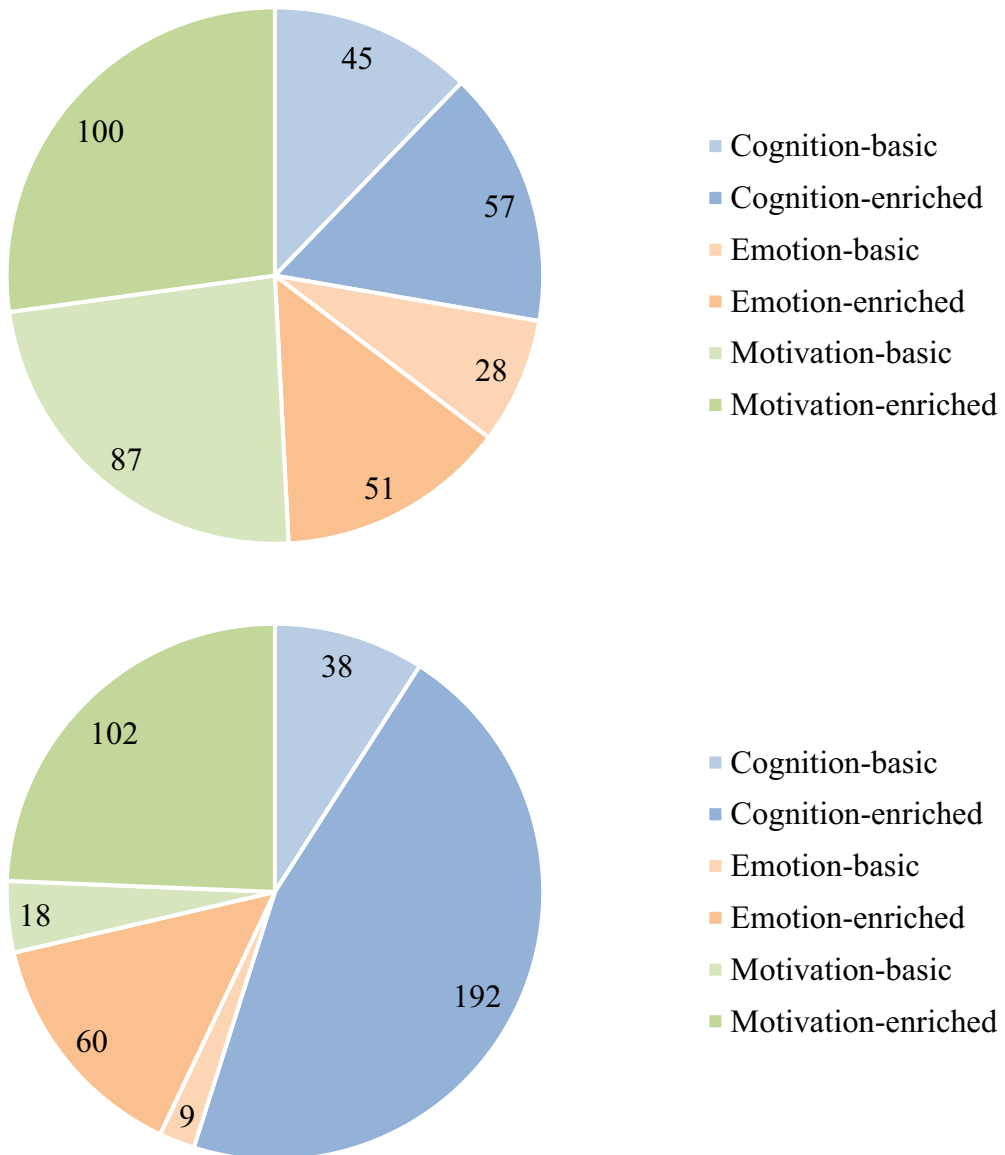


Figure 1. Frequencies of child-focused ($n = 368$, upper diagram) and adult-focused ($n = 419$, lower diagram) mental state utterances.

of child- and adult-focused categories are shown in [Figure 1](#) (for examples, see [Appendix 2](#)). The Friedman test indicated differences in the types of child- and adult-focused mental state utterances, $\chi^2(5) = 21.135$, $p < .001$. Pairwise comparisons showed that professionals referred more often to adults' cognition than to their emotions ($p = .023$), children's cognition ($p = .030$), or children's emotions ($p = .010$).

The Wilcoxon signed rank test indicated that the professionals more often produced enriched than basic level utterances (see [Figure 1](#)) when they talked

about adults' cognition ($Z = 2.207$, $p = .027$), motivation ($Z = 2.201$, $p = .028$), and emotion ($Z = 2.207$, $p = .027$). There were no similar differences regarding child-focused utterances. In the following analyses, the basic and enriched level categories were combined to decrease the number of variables.

To control for variation in the length of the discussions, frequency rates per minute were calculated for each professional by dividing the frequency of the child-focused and adult-focused cognition-, motivation-, and emotion-related mental state utterances by the number of meeting minutes at each time point. Frequency rates of different types of mental state utterances are reported in 10-minute intervals in [Table 1](#).

The Wilcoxon signed rank test revealed that in the second shared review, the professionals referred more often to adults' than to children's mental states ($Z = -2.207$, $p = .027$). Such differences were not found during the first and third discussions. The differences in type of mental state talk within the three shared review discussions were explored using Friedman tests. When comparing the child-focused mental state types within each time point, as shown in the upper part of [Table 1](#), differences were found within the first, $\chi^2(2) = 8.667$, $p = .013$ and the second, $\chi^2(2) = 9.478$, $p = .009$, but not the third shared review discussion, $\chi^2(2) = 4.455$, $p = .108$. Post hoc pairwise comparisons revealed that in the first discussion, the professionals talked more often about children's motivational than emotional states ($p = .018$), whereas in the second discussion, they talked more often about children's motivational than cognitive ($p = .018$) and emotional ($p = .042$) states. Regarding the adult-focused mental states in the lower part of [Table 1](#), there were differences within the first, second, and third shared reviews, $\chi^2(2) = 9.000$, $p = .011$; $\chi^2(2) = 7.364$, $p = .025$; and $\chi^2(2) = 9.000$, $p = .011$, respectively. The professionals referred more often to cognition than to motivation and emotion in all discussions ($p_s < .05$), except for motivation in the second discussion.

To explore the relationships between child-focused and adult-focused mental state utterances within the three shared review discussions, Spearman rank order correlation coefficients were calculated. As shown in [Table 2](#), the more often the professionals talked about the children's emotions during the first discussion, the more often they also referred to the adults' emotions and the less they referred to the adults' motivation. Moreover, the more often the professionals referred to children's motivational states during the third discussion, the more they also talked about adults' motivational states. No pattern of significant relationships was detected during the second discussion.

Self-reports on interaction skills

The two summary variables of the professionals' self-reports, attuned interaction and guidance, were positively correlated at the pretest ($r_s = .841$; $p = .036$) and at the posttest ($r_s = .928$; $p = .008$). The same was true for the correlations of the two variables between the pretests and posttests ($r_s = .899-.971$; $p_s < .05$). The Wilcoxon signed rank test did not show any differences between the pre- and posttest scores for attuned interaction and guidance ($Z = -526$ and -271 , respectively; $p_s > .05$). The means (SD) were high for both tests: for the pretest, 4.15 (0.47) for attuned interaction and 4.20 (0.53) for guidance, and for the posttest, 4.23 (0.72) for attuned interaction and 4.32 (0.47) for guidance.

Moreover, the more positively the professionals perceived their attuned interaction skills with the children before the VERP training, the more often they used adult-focused

mental state utterances (in total) in the second ($r_s = .886$; $p = .019$) and the third review discussions ($r_s = .812$; $p = .050$); the first discussion showed a deviant pattern ($r_s = .086$; $p = .872$). However, the correlations did not reach significance between attuned interaction on the posttest after the VERP training and the observed mental state produced during the three discussions ($r_s = -.086$, $p = .872$; $r_s = .771$, $p = .072$; and $r_s = .754$, $p = .084$, respectively). No other significant correlations were detected between perceived interaction and observed mentalization.

Discussion

ECE professionals are expected to implement high-quality pedagogical interaction with children and to strive for multi-professional collaboration based on trust, appreciation, and respect. The present study was the first VERP intervention in a Finnish ECE context, adding to the limited number of group-based professional in-service trainings using video-stimulated reflection. Team members with different educational backgrounds were guided to reflect on their own and others' behavioral and mental actions based on video recordings of their classroom interactions with children.

Our first purpose was to explore the frequency and content of the team members' mental state talk during VERP training by developing an innovative coding scheme. The fine-grained scheme captures the target (King and La Paro 2015), the type (e.g. Sheng, Dong, and Hu 2021), and the richness (Demers et al. 2010) of mental state talk during the video-stimulated shared reviews. The frequency of mental state talk was stable throughout the training. The team members equally often referred to children's and adults' mental states, which was expected because the VERP trainer guided reflection on different targets' perspectives (Kennedy and Landor 2015; see also Korthagen 2017). Interestingly, the most significant experience reported by the professionals in the individual post-training interviews was when the shared review discussion gave insight into their own or others' behavioral or mental actions. One professional stated, 'it was impressive because originally, I felt the situation was chaotic, but after watching it on the video, I think it was not a total disaster'.

Throughout the training, the team members more often brought up topics related to cognition and motivation than emotion. When discussing adults, they reflected on their own and colleagues' cognitive states, such as thinking and remembering. When discussing children, they tended to reflect on motivational states, such as desires and wishes. These differences could reflect variation in the needs of the target children as well as the team members' professional interests. Emotional states were less often brought up during the discussions, which is in line with observations of emotion talk during classroom interactions (Degotardi, Han, and Hu 2021; King and La Paro 2015; Sheng, Dong, and Hu 2021). The low frequency could be due to feelings of insecurity in verbally expressing emotions or to lack of interest in reflecting on emotions. The coding scheme, which was developed to target explicit references to mental states, could also be improved by including non-verbal actions, such as emotional gestures and facial expressions. According to Denham, Basset, and Zinsler (2012), ECE professionals could utilize their reflections on emotions as pedagogical opportunities to enhance children's social-emotional skills. In future VERP interventions, the trainer could focus more on scaffolding the professionals' reflection on emotions during emotion-eliciting situations.

The present study was the first to code the richness of ECE professionals' mental state talk, which was originally coded by Demers et al. (2010) with a sample of mothers. When the team members discussed children, they equally often provided vivid examples and explanations of the mental state (enriched) or only mentioned the mental state (basic). The professionals more often used enriched than basic utterances, especially when they focused attention on themselves and shared their own thoughts and emotions with others. The VERP intervention aims at changing mental representations, and the richness of the descriptions could offer a deeper understanding of professional development. Contrary to some parental studies on high-risk families (Huber, McMahon, and Sweller 2015; Riva Crugnola et al. 2019), there was no change in the ECE professionals' mentalization. It is possible that due to different qualification requirements, educational backgrounds, or work experience, some team members were already high in mentalizing ability before the VERP intervention. On the other hand, ECE professionals must simultaneously reflect on diverse children's mental states and behavior during their work in inclusive classrooms. A longer and enriched intervention might be beneficial for professionals in the Finnish ECE context to achieve increased levels of mental state talk and enriched explanations, including for children with special needs and immigrant backgrounds.

The second purpose was to explore the relationships between ECE team members' self-reported interaction skills and observed mental state talk, as prior observational studies reported this association (Degotardi and Sweller 2012; Helmerhorst, Colonnese, and Fukkink 2019). Our findings show that the professionals who perceived themselves as more attuned during interactions with children before the first shared review more often engaged in reflecting on adults' and especially their own mental states in the second and third shared reviews. The team members' perceptions of their interaction skills did not improve after the VERP training, which could be due to a ceiling effect shown by the high scores on the pretest. It is also possible that the professionals became more aware of their interaction skills and therefore evaluated themselves in a more realistic manner on the posttest, but the self-report did not capture such changes. This interpretation is supported by Spilt et al. (2012), who labeled this training effect as the phenomenon 'from ignorance to awareness'. Taken together, because so much of human behavior is unconscious, professional development demands more conscious reflection on one's own and others' actions and mental states (Korthagen 2017). A case in point was one professional's comment: 'I notice that it is something that I am not aware of'.

Our observational data on guided discussions, where the aim is to direct the ECE team members' attention to children's and their own behavior and mental states, cannot be directly compared with observation data on ECE professionals' talk with children during classroom interactions. Variation in the professionals' use of overall and different types of mental states could be due to different methods of data collection and coding schemes (e.g. Degotardi and Sweller 2012; King and La Paro 2015) and observed activities (e.g. Colonnese et al. 2017; Frampton, Perlman, and Jenkins 2009). Additionally, sample characteristics such as age and number of children (e.g. Farkas et al. 2017; Helmerhorst, Colonnese, and Fukkink 2019), professionals' educational level and work experience (e.g. King and La Paro 2015; Sheng, Dong,

and Hu 2021), and culture (Degotardi, Han, and Hu 2021) could cause variation in findings across observational studies.

Limitations and future research

Some limitations related to the assessment of professional development and characteristics of the VERP intervention are important to consider. First, although the number of ECE professionals in the current study allowed for a pilot of the new coding scheme, the sample size was too small to draw reliable conclusions about professional development. Second, the coding scheme did not include the duration of mental state talk or nonverbal expressions of, for example, emotional states, which might influence the assessment of mental states and outcomes of the intervention. Our observation of guided discussions during shared review sessions taps into professional growth, whereas observations in the classroom can give insight into professionals' competence in supporting children's development. In future research, the coding scheme can be validated using observations of professionals' mental state talk during interactions with children and well-established, widely used self-assessments.

Although the trainer aimed at creating trusting and warm relationships, the team members might have needed a longer and enriched training to develop genuine and deeper reflections during the intervention. In line with Soni's (2021) report, the VERP intervention could help professionals deepen their understanding of each other and their relationship with children in inclusive classrooms. In the post-training interview, the team members noticed the benefit of shared discussions and expressed increased confidence in interacting with children and collaborating with each other. Future research into the implementation of the VERP training with its focus on mental states and corresponding assessment tools should deepen our understanding of the experiences of the participants during the intervention and its effects on ECE professionals' competence in reflecting on others' minds and interacting with them.

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APPENDIX

Appendix 1. Questionnaire on interaction skills: attuned interaction (items 1–22) and guidance (items 23–35)

Being Attentive

1. I look interested and friendly.
2. I give time and space for the child.
3. I wonder what the child is doing, thinking, or feeling.
4. I enjoy watching the child.

Encouraging Initiatives

5. I listen actively.
6. I speak in a gentle voice.
7. I name positively what I see, think, or feel.
8. I use friendly and/or playful intonation in a suitable manner.
9. I describe what I am doing.
10. I look for when the child initiates interaction.

Receiving Initiatives

11. I show that I have heard or noticed when the child initiates interaction.
12. I acknowledge through my body language when the child initiates interaction.
13. I return the eye contact, smile, and nod.
14. I receive what the child is saying or doing with words.
15. I repeat/use the child's words or phrases.

Developing Attuned Interactions

16. I respond when the child initiates interaction.
17. I check that the child understands me.
18. I attentively wait my turn.
19. I give a second (and further) turn on the same topic.
20. I give and take short turns.
21. I contribute to interaction/activity equally.
22. I cooperate with and help the child.

Guiding

23. I support the child's participation (scaffolding).
24. I expand on the child's response. I build my response on the child's response.
25. I judge and adjust my actions to the child's needs.
26. I give information when needed.
27. I offer choices that the child can understand.
28. I make suggestions that the child can follow.

Deepening Discussion

29. I support goal-setting.

30. I help the child in problem-solving.
31. I name differences of opinion in an appropriate manner.
32. I investigate the child's intentions behind words/actions.
33. I name contradictions/conflicts (real or potential).
34. I easily reach a new, shared understanding.
35. I manage conflicts by returning the child to attuned interaction.

Appendix 2. Examples of cognition-, emotion-, and motivation-related mental state utterances

Target	Cognition	Emotion	Motivation
Child	<p>Basic: However, they knew that we would continue . . . that funny game.</p> <p>Enriched: That he noticed that I am, you know – probably he thought that I didn't notice because perhaps he didn't see if I noticed them.</p>	<p>Basic: Yes, he enjoys them.</p> <p>Enriched: I agree. I think he is not normally like that. Was he somehow nervous? Yes, that kind of fooling around, that kind of restlessness [is] strange.</p>	<p>Basic: CHILD, too, is as opinionated as possible.</p> <p>Enriched: Because it was so fun. That's why he won't stop laughing his head off, because he wants to do it again and again.</p>
Self	<p>Basic: I don't remember that situation very well.</p> <p>Enriched: – because I write at the same time – then I don't pay attention to what the children are doing, and that's why it is easier to stay calm.</p>	<p>Basic: She is quite touching here, though.</p> <p>Enriched: No but sometimes it bothers me that [the child] can't get attention, that sometimes it may be days that I have said good morning to him in the morning, and in the evening, I say goodbye . . . and that's it.</p>	<p>Basic: I tried to make sure that we all had the same number of pieces.</p> <p>Enriched: I wanted to recall [the rules] and then the conversation continued about [the rules]; therefore, I started with them, and, indeed, they did make some additions.</p>
Other	<p>Basic: You observe there carefully now.</p> <p>Enriched: I think that A2's facial expressions show that she is playfully involved in that situation.</p>	<p>Basic: Even though you would be annoyed, and the pie is waiting [in the oven], it is unhurried, and you don't have to rush.</p> <p>Enriched: Well, that's A1's reaction when CHILD gets [angry] and strikes fists at the table, and [A1 is] just like laughing a little bit and like this genuine 'Oh sorry', like that astonishment that –</p>	<p>Basic: You tried to help in 'the laugh oneself sick' situation.</p> <p>Enriched: Then they went to get more blocks, and then you see, don't you, that CHILD is there in front of it when they are trying to put the blocks, and you wait for the CHILD to move from there.</p>
Multiple targets	<p>Enriched: The following utterances were coded as adult-focused enriched cognition and child-focused enriched emotion when the professional commented on a video clip of an interaction with a child: '<i>I noticed</i> that she is a little bit <i>astonished</i> too, and together, <i>we think about what is inside of it</i>, and then <i>we look</i> [at the toy], and then <i>I look</i> at her like <i>there is a candy</i>'. The clause of the first utterance (<i>I noticed</i>) indicates that the professional's own cognition was the focus. The objects of noticing included the shared emotion of the professional and the child (<i>astonished too</i>), followed by multiple cognitive and perceptual consequences (<i>we think about what is inside of it, we look, I look, there is a candy</i>).</p>		