

An analysis on the mind-mindedness of infant teachers in South Korea

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Abstract

This study focuses on infant teachers' mind-mindedness when interacting with infants and investigates the differences of their mind-mindedness according to teachers' and infants' variables. Participants were 80 infant-teacher dyads in childcare settings in South Korea, and mind-mindedness was assessed with video-recordings of their interactions based on Meins and Fernyhough's (2012) coding manual. As results, the teachers produced mind-related comments in about 7% of their interactions with the infants, with a low rate (< 1%) of non-attuned comments. Among the appropriate mind-related comments, they made talking on the infant's behalf most frequently, followed by desires and preferences, emotions, cognitions in the order. Some differences were found in their use of appropriate mind-related comments according to the teachers' age, major, and career, and the infants' age and continuity with the teachers. These results are discussed in relation to mind-mindedness as a significant indicator of infant-teacher relationships influenced by some variables and how to improve it.

Keywords: mind-mindedness, infant teachers, infants, childcare

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Introduction

The mind represents the aggregation of mental state such as beliefs, desires, emotions, and intentions (Astington, 1993). Reading someone's mind starts from knowing the state of his/her mind (Kim, 2011) and includes a cognitive process such as recognizing, remembering, and reasoning his/her internal state; thus, it is classified as an area of social cognition (Goldman & de Vignemont, 2009). In specific, to be able to read someone's mind accurately, one needs to figure out what the situation is, what type of personality and kind of prejudice s/he has, what s/he wants and thinks, how his/her facial expression is, what mood s/he is in, and so on by observing him/her. Through this process, reading the mind is also important in building and maintaining relationships (Kim, 2011).

It is known that infants' understanding of the mind starts to develop around seven to nine months, and they recognize that people have intentions, i.e., minds, by looking at the directions at which adults are pointing (Pawl, 2006). Afterwards, infants want to influence and lead other people's minds and realize that their desires and intentions can enter other people's minds (Pawl, 2006). Many studies (e.g., Laranjo et al., 2010; Meins & Fernyhough, 2012; Meins et al., 2002) have found that mothers' mind-related comments during infancy are the predictive factor for the theory of mind, false belief task, and appearance-reality task in early childhood. According to Astington and Barriault (2001), the theory of mind develops if one is constantly exposed to people talking about what they think, know, want, and feel. Therefore, infants' exposure to the mind-related comments is vital since it becomes a path for them to recognize the mental state of themselves and other people (Meins et al., 2003).

Infants experience the process of bringing out, sharing, and negotiating their personal point of view within the social interactions (Degotardi & Pearson, 2014). In addition, they form the expectations that their minds will be understood by others, and others will properly respond based on their shared minds. Adults being with infants can help infants' development and learning through the collaborative construction based on infants' minds (Degotardi & Pearson, 2014). In order to reflect infants' mind appropriately, adults should observe them carefully, try to understand their points of views or the way they understand the world, and verbalize those to them (Degotardi & Pearson, 2014; Pawl, 2006).

Even though there are many concepts that emphasize the ability to pay attention to the

minds of others and understand them (e.g., meeting of minds, mentalizing, perspective taking, reflective functioning, and insightfulness), the concept focused on the minds of infants is the mind-mindedness. Mind-mindedness means “the caregiver’s proclivity to treat the young child as an individual with a mind” (Meins & Fernyhough, 2015, p. 2) and try to enter into the mind of the infant, and the ability to do so (Degotardi & Pearson, 2014). The difference of mind-mindedness from other concepts is that it considers significant whether the caregiver’s mind-related comments are focused on the infant and whether these reflect the infant’s mind appropriately (Meins et al., 2001; Meins et al., 2012). The studies of Meins and her colleagues (e.g., Meins et al., 2001; Meins et al., 2012) revealed that the mother-infant’s attachment security is predictable only when the mother reads the infant’s mental state and process appropriately and is ‘in synch’ with the state of the infant’s perceptions, emotions, and cognitions (Degotardi & Pearson, 2014). Ryu and Lee (2016) also emphasized the importance of reflecting the infant’s mind appropriately by showing low quality of the infant-teacher relationship when the infant’s mind is read but not attuned.

Meanwhile, some studies classified internal state terms into subcategories such as emotions, desires, and cognitions with the focus on what people feel, want, and think (Helmerhorst et al., 2019; Jenkins et al., 2003; Ruffman et al., 2002). These studies were usually conducted on mothers, revealing that mothers use desire-related terms most frequently (Kim, 2014; Osório et al., 2012); more specifically, mothers use desire-related terms more often on children aged two to four years, while they use cognition-related terms more on children aged four to six years (Jenkins et al., 2003). In addition, Symons et al. (2006) showed that young children’s development differs depending on which part of the mind the caregivers focus on, and Degotardi and Sweller (2012) found out that infant teachers use non-beliefs-related talks six times more than beliefs-related talks and teachers using many beliefs-related talks interact with infants in more sensitive and stimulating ways. These studies suggested the need to examine subcategories of the mind-related comments beyond the importance of using mind-related terms, and to include not only comments using explicit internal state terms based on what the infant may be thinking, experiencing, or feeling but also those that “should clearly be dialogue intended to be spoken by the infant” without internal state terms (Meins & Fernyhough, 2015, p. 5). This implies that the concept of mind-mindedness needs to be expanded in theory, research, and practice.

Until now, studies that examined the subcategories of teachers' mind-related comments are extremely rare, and the study of Ryu and Lee (2016) seems to be the only research that explored whether infant teachers' mind-related comments reflect infants' mind appropriately. Even though their study discovered that infant teachers use appropriate mind-related comments more frequently than non-attuned mind-related comments, it did not look into the tendencies according to the subcategories of mind-related comments. Since the studies on internal state terms (e.g., Helmerhorst et al., 2019; Hu, Torr et al., 2019) found out the internal state terms used can vary according to infants' age or teachers' interaction quality or education levels, it is necessary to examine infant teachers' mind-mindedness that reflects infants' minds by subcategorizing it and in relation to teachers' and infants' variables. In addition, cultural differences and language styles should be taken into account in mind-mindedness research (Dai et al., 2020), and this study is a first non-Western study to be published in English on infant teachers' mind-mindedness using Korean to our knowledge.

This study focuses on infant teachers' mind-mindedness when interacting with infants and investigates the differences of their mind-mindedness according to teachers' and infants' variables. Two research questions were posed:

1. What are the aspects of infant teachers' mind-mindedness according to subcategories (desire and preferences, cognitions, emotions, talking on the infant's behalf)?
2. What are the differences of the mind-mindedness according to teachers' and infants' variables?

Method

Subjects of this Study

The subjects of this study were 80 infant-teacher dyads in childcare centres located in South Korea (Seoul and Gyeonggi provinces). Each teacher was paired with two infants (1 boy, 1 girl). The average age of the infants was 19.6 months ($SD = 3.46$, range=13-24); the average total length of attending the childcare centre was 5.8 months ($SD = 3.36$, range=1-18), of which the average period with the teacher was 4.8 months ($SD = 2.03$, range=1-8).

The average age of the teachers was 34.2 years ($SD = 10.73$, range= 21-56); the average career of the teachers was 4.46 years ($SD = 4.53$, range=0.4-15.6). The majors of the teachers varied including early childhood education (27.5%), childcare (32.5%), social welfare (12.5%), and others (27.5%)¹.

Instrument

The instrument used to assess the mind-mindedness of the teachers was Meins and Fernyhough (2012)'s Mind-Mindedness Coding Manual Version 2.1 with some modifications into Korean. The original instrument judges whether mind-related comments are appropriate and includes desires and preferences, cognitions, emotions, epistemic states, and talking on the infant's behalf to judge mind-related comments. Meins and Fernyhough (2012) included intentions in the desires and preferences subcategory even though explicit internal state terms are not used; however, those are not clearly distinguished from talking on the infant's behalf since the subject is frequently omitted in Korean (e.g., "(I'm) Going to catch it.>"). Accordingly, comments related to intentions are included in talking on the infant's behalf by considering them to read the infant's mind on the infant's behalf in this study. In

Table 1. *Subcategories and Examples of Mind-related Comments*

Subcategory	Examples
Desires and preferences	like, dislike, love, want, prefer, hate, cannot stand, etc.
Cognitions	think, decide, choose, know, remember, realize, interested, not interested, notice, focused, intent, expect, working it out, fascinated, etc.
Emotions	happy, joyful, gleeful, angry, sad, scared, serious, stressed, in a good/bad mood, worried, anxious, confused, excited, startled, surprised, bored, etc.
Talking on the infant's behalf	any utterance that is obviously meant to be dialogue said/thought by the infant, any utterance that actualizes the infant's intention before s/he put it into behavior, etc.

Note. Adapted from Meins and Fernyhough (2012) with some modifications based on the linguistic features of Korean.

¹ In South Korea, in order to obtain the childcare teacher license (level 2), students must complete 17 childcare-related courses and at least 51 credits at a junior college or a school of the same level from 2014. It is possible to obtain a childcare teacher license from various majors such as the Department of Early Childhood Education, the Department of Childcare, the Department of Social Welfare, and the Department of Nursing.

addition, some categorical examples of the mind-related comments were added or deleted reflecting the linguistic features of Korean. Furthermore, the epistemic states subcategory was excluded from data analysis of this study, since comments related to epistemic states (e.g., teasing, joking) were not found in the collected data for this study. Therefore, the final subcategories used in this study were desires and preferences, emotions, cognitions, and talking on the infant's behalf. Detailed examples of the subcategories are presented in Table 1.

Data Collection and Analysis

In order to examine the infant teachers' mind-mindedness, we observed play and interactions between infants and their teachers via video-recordings. One of the researchers recorded each dyad's play and interaction without interruption and disruption in an empty classroom equipped with toys appropriate for the infants' age. The recording was started after the infant did not pay attention to the researcher and lasted for 20 minutes. If any unexpected situation occurred before the 20-minute was reached, recording was continued on another day. The videotaped session was transcribed by the unit of the teacher's utterances in its entirety.

Comments including mind-related terms (desires and preferences, emotions, and cognitions) and comments not including mind-related terms but reflecting on the infant's intention or thoughts (talking on the infant's behalf) were classified as mind-related comments. Each utterance was judged for their appropriateness and subcategories by considering whether it reflected the infant's facial expressions or gestures, whether it considered the context of the infant's behaviour, and whether both the infant and the teacher kept joint attention on the same thing (Meins & Fernyhough, 2012). The inter-rater reliability was maintained at an average of 95% or higher during the analysis.

For data analysis, utterances' mean, standard deviation, range, and ratio according to the total and subcategories (desires and preferences, cognitions, emotions, talking on the infant's behalf) of teachers' mind-mindedness were calculated. In addition, Mann-Whitney test, Kruskal-Wallis test, and Wilcoxon test were performed on the ratio of each subcategory to the total utterances for the differences of the mind-mindedness according to the teachers' and

the infants' variables. In addition, the differences that were found among groups through the Kruskal-Wallis test were verified through the Mann-Whitney test as a post hoc analysis.

Results

The teachers had an average of 291.93 utterances, and of these utterances, there were an average of 19.36 mind-related comments per teacher ($SD=10.30$), which was 6.69% of all utterances. Of these mind-related comments, there was an average of 16.85 comments that were appropriately related to mind-mindedness ($SD=9.55$), which was 5.73% of all utterances. Thus, the analyses below were conducted with the appropriate mind-related comments as teachers' mind-mindedness.

Subcategorical aspects of infant teachers' mind-mindedness are presented in Table 2. Teachers' talking on the infant's behalf ($M=3.06$, $SD=2.34$) and desires and preferences ($M=1.89$, $SD=1.74$) were found to account for the majority of total mind-mindedness ($M=5.73$, $SD=3.24$). Meanwhile, emotions ($M=0.41$, $SD=0.59$) and cognitions ($M=0.37$, $SD=0.55$) were found to account for relatively low proportion. Talking on the infant's behalf was produced 1.62 times more than comments regarding desires and preferences, 7.46 times more than comments regarding emotions, and 8.27 times more than comments regarding cognitions. In other words, although the teachers did not use internal state terms explicitly, they frequently brought out the infant's thoughts or intentions and verbalized those to the infant.

Table 2. *Subcategorical Aspects of Infant Teachers' Mind-mindedness*

Subcategory	Teachers' mind-mindedness comments		
	<i>M(SD)</i>	Range	%
Desires and preferences	1.89(1.74)	0.00-8.63	32.98
Cognitions	.37(0.55)	0.00-2.34	6.46
Emotions	.41(0.59)	0.00-3.00	7.16
Talking on the infant's behalf	3.06(2.34)	0.00-13.23	53.40
Total	5.73(3.24)	0.46-20.11	100.00

The differences of mind-mindedness according to teachers' variables are presented in Table 3. Overall, significant differences in teachers' mind-mindedness were found according to their age ($\chi^2=17.11$, $p<.001$), major ($\chi^2=8.39$, $p<.05$), and career ($\chi^2=6.28$, $p<.05$). Based on the post hoc test results, teachers in their 30s, teachers majoring in early childhood education or social welfare, and teachers with over 3 years of career used appropriate mind-related comments more than the others.

Table 3. *Differences of Mind-mindedness according to Teachers' Variables*

Age	20s (n=36)	30s (n=18)	Over 40s (n=26)	χ^2 (Kruskal-Wallis)
Desires and preferences	34.38 ^a	52.39 ^b	40.75	7.23 [*]
Cognitions	39.31	51.14 ^b	34.79 ^a	6.36 [*]
Emotions	36.10	47.75	41.58	3.51
Talking on the infant's behalf	41.79	52.81 ^b	30.19 ^a	10.28 [*]
Total	36.86 ^a	60.06 ^b	32.00 ^a	17.11 ^{***}

Major	Early childhood education (n=22)	Childcare (n=26)	Welfare (n=10)	Others (n=22)	χ^2 (Kruskal-Wallis)
Desires and preferences	49.02 ^b	30.35 ^a	49.60 ^b	39.84	7.63 [*]
Cognitions	34.98 ^a	41.58 ^a	60.65 ^b	35.59 ^a	9.50 [*]
Emotions	33.39 ^a	37.75 ^a	61.60 ^b	41.27 ^a	11.46 [*]
Talking on the infant's behalf	44.41 ^b	47.90 ^b	38.20	28.89 ^a	12.10 [*]
Total	46.50 ^b	39.00	52.90 ^b	30.64 ^a	8.39 [*]

Career	Under 3 years (n=40)	3-5 years (n=14)	Over 5 years (n=26)	χ^2 (Kruskal-Wallis)
Desires and preferences	33.94 ^a	54.04 ^b	43.31	8.34 [*]
Cognitions	39.26	39.89	42.73	.42
Emotions	40.29	35.50	43.52	1.23
Talking on the infant's behalf	38.19	35.14	46.94	3.14
Total	34.03 ^a	45.71 ^b	47.65 ^b	6.28 [*]

Note. Mean rank

* $p < .05$. *** $p < .001$; ^{a, b} shows the differences between groups

In terms of subcategories, significant differences were found in 3 subcategories [desires and preference ($\chi^2=7.23$, $p<.05$), cognitions ($\chi^2=6.36$, $p<.05$), and taking on the infant's behalf ($\chi^2=10.28$, $p<.05$)] according to age, all the four subcategories ($\chi^2=7.63$, $p<.05$;

$\chi^2=9.50, p<.05$; $\chi^2=11.46, p<.05$; $\chi^2=12.10, p<.05$ relatively) according to major, and only desires and preferences ($\chi^2=8.34, p<.05$) according to career. In specific, teachers who were in their 30s made more comments related to desires and preferences, cognitions, and talking on the infant's behalf; teachers who majored in early childhood education made more comments related to desires and preferences and talking on the infant's behalf, while teachers who majored in social welfare made more comments related to desires and preferences, cognitions, and emotions and teachers who majored in childcare made more comments related to talking on the infants' behalf; the teachers with three to five years of career used comments related to desires and preferences more than teachers with under three years of career.

The differences of mind-mindedness according to infants' variables are presented in Table 4. Teachers who had been in charge of the infants from their admission to the childcare centre used comments related to talking on the infant's behalf ($Z=-2.28, p<.05$) more frequently than those who did not, and teachers made more comments related to desires and preferences ($Z=-2.12, p<.05$) and emotions ($Z=-2.97, p<.01$) when the infants were younger (under 18 months). In other words, teachers' focusing and reflecting on the infant's mind differed according to the infants' development or the context of their experiences with the infant.

Table 4. *Differences of Mind-mindedness according to Infants' Variables 1*

Continuity with the teacher	Teacher changed (<i>n</i> =8)	Same teacher (<i>n</i> =72)	Z (Mann-Whitney)
Desires and preferences	37.25	40.86	-.42
Cognitions	44.94	40.01	-.62
Emotions	43.00	40.22	-.34
Talking on the infant's behalf	22.75	42.47	-2.28*
Total	28.00	41.89	-1.60
Age	Under 18 months (<i>n</i> =28)	Over 19 months (<i>n</i> =52)	Z (Mann-Whitney)
Desires and preferences	47.98	36.47	-2.12*
Cognitions	46.46	37.29	-1.82
Emotions	50.38	35.18	-2.97**
Talking on the infant's behalf	37.88	41.91	-.74
Total	45.32	37.90	-1.36

Note. Mean rank

* $p < .05$. ** $p < .01$.

The differences of mind-mindedness according to infants' gender are presented in Table 5. No differences were found in teachers' mind-mindedness according to the gender of the infants. This shows that teachers did not consider the infant's gender as a basis for focusing on the infant's mind.

Table 5. *Differences of Mind-mindedness according to Infants' Variables 2*

Gender	Boys (n =40)	Girls (n =40)	Z (Wilcoxon)
Desires and preferences	.009(.008)	.008(.006)	-.57
Cognitions	.002(.003)	.001(.002)	-1.76
Emotions	.002(.002)	.002(.003)	-.09
Talking on the infant's behalf	.013(.008)	.014(.011)	-.23
Total	.024(.011)	.024(.015)	-1.09

Note. *M(SD)*

Discussion and Implication

This study focused on exploring the prevalence of infant teachers' mind-mindedness during infant-teacher play interactions. The most frequently used mind-related comments by the teachers were talking on the infant's behalf; the teachers made efforts to show the infant that they are paying attention to his/her mind and saying on his/her behalf even though they do not directly use internal state terms. This finding is not found in previous studies on parents (e.g., Kim, 2014; Jenkins et al., 2003; Ruffman et al., 2002), since they only have been looking at whether internal state terms were directly used or not. It also shows that infant teachers are paying more attention to infants' mind than already known, considering the fact that talking on the infant's behalf includes comments that reflect on infants' thoughts or intentions. Degotardi (2010) found that teachers' close attention to infants' minds or behaviours and representing them elaborately are connected to sensitivity and stimulations in interactions with infants. In addition, since the emergent and effective curriculum in infant educare starts from infants, teachers' efforts to pay close attention to infants' minds should

be valued and encouraged.

Among the explicit mind-related comments, desires and preferences were used in the highest ratio. This result is in line with the findings of Jenkins et al. (2003), Kim (2014), Osório et al. (2012), and Ruffman et al. (2002), which reported that parents use desire state terms most frequently to their infants. This study also confirms the findings of Helmerhorst et al. (2019) that teachers also use desire-related terms to infants as parents do. The fact that over 85% of infant teachers' mind-related comments belong to talking on the infant's behalf and desires and preferences subcategories can be considered as showing teachers' willingness to scaffold infants developmentally by observing and reading what infants intend or want. In other words, infant teachers try to achieve educational goals through developmental supports or linguistic modelling for infants. Studies on mothers such as Ruffman et al. (2002) and Symons et al. (2006) reported that desire state terms used by mothers predict children's later development better than other terms. Thus, infant teachers' paying close attention to infants' desires and intentions and expressing those in language to infants can positively contribute to the development of infants.

In contrast, infant teachers in this study used terms on cognitions or emotions relatively less frequently. Since cognitive process of infants includes paying attention to an object or a situation, choosing one way out of several, focusing on what he/she chose, and trying to deal with or solve it with a goal (Degotardi & Sweller, 2012; Meins & Fernyhough, 2012), it is worthwhile for teachers to pay attention. Teachers' attention to infants' cognitive process means that they participate along with infants in the process of infants' learning about the world and support infants' construction of knowledge. Meanwhile, since emotional support is largely made through the atmosphere of relationships or nonverbal communication rather than language (Biringen, 2008), it may not stand out in the linguistic interactions. Since there are no prominent results even in studies on internal state terms yet, more studies on it are needed in the future.

In terms of the differences of mind-mindedness according to teachers' variables, teachers in their 30s, majoring in early childhood education or social welfare, with over 3 years of career used appropriate mind-related comments more than the others. These results partly differ from the results of Ornaghi et al. (2020), which revealed that the age and career of teachers are negatively correlated with mind-mindedness; this may be due to differences in

teacher composition and organizational culture of childcare between Italy and Korea. In addition, regarding major, the result of this study is in line with Hu, Torr et al. (2019) and Hu, Degotardi et al. (2019), which found that infant teachers who majored in early childhood education at the university level are more positive in their language use with infants; majoring in early childhood education or social welfare in Korea means having academic background equal to or higher than college or university. This result also implies the necessity of university-level education for infant teachers. Furthermore, Ornaghi et al. (2020) highlighted that what pre-service teachers have learned is more important than education level itself; therefore, teacher educators should support pre-service teachers to pay close attention to infants' point of view and interact with them based on it.

In terms of infants' variables, continuity with the teacher and infants' age made differences in teachers' mind-mindedness. In particular, teachers who have been in charge of the infants from their admission to the childcare used comments related to talking on the infant's behalf more frequently; this result strongly supports the teacher continuity and a relationship-based approach that infant scholars have constantly emphasized in infant educare (Lee, 2006; Wittmer & Petersen, 2010). In addition, teachers made more comments related to desires and preferences and emotions when infants were younger (under 18 months). It is similar to the findings of Jenkins et al. (2003), in which mothers use desire state terms more often to children aged two to four years, while use cognition state terms more to children aged four to six years. Kim (2014) recommended that mothers use desire state terms frequently when the child is young and use not only desire but also emotion and cognition state terms frequently as the child grows older; this is also consistent with the developmental process of young children's social understanding (Ruffman et al., 2002). Thus, it is desirable that infant teachers make more comments on desires and preferences and emotions to younger infants, like teachers in this study, and gradually expand the focus according to the development of infants.

In this study, there was no difference in infant teachers' mind-mindedness according to the gender of infants. This is similar to the findings of McMahon and Mein (2012), who studied preschoolers and their mothers. However, since attachment security and mind-mindedness are related, it is difficult to exclude the possibility that mind-mindedness is related to the gender of infants (Laranjo et al., 2010); thus, further research is needed in this aspect.

The significance and implications based on the results of this study are as follows. First, focusing on mind-related comments that Korean infant teachers made to infants in Korean, this study included not only explicit mind-related comments but also comments with the mind of infants in mind, expanding the concept of mind-mindedness. As Dai et al. (2019) pointed out, cultural and linguistic expressions in non-Western cultures may differ from those in Western cultures. In addition, even though many mind-related terms are used, if these do not properly reflect the infant's mind, these can interfere with the healthy development and relationship formation of infants (Ryu & Lee, 2016). Not only for the development of infant-teacher relationships but also for the development of infants, it is important for infant teachers to appropriately read the infant's mind through observation and interact with him/her based on it. Therefore, it is necessary to further expand or refine the concept of mind-mindedness beyond explicit linguistic expression.

Second, this study is significant in that it laid the groundwork for supporting infant teachers by examining the differences in their mind-mindedness according to teachers' and infants' variables. The results that there can be differences in mind-mindedness depending on the teachers' age, major, and career suggest the importance of teacher education as well as of teacher experience. While supporting infant teachers to continue to work, it is necessary to include a relationship-based approach and mind-mindedness in the content of professional teacher education to prepare prospective teachers for the role of infant teachers (Cho et al., 2022; Ornaghi et al., 2020; Shin & Lee, 2011). Furthermore, it is necessary to help infants maintain continuity with the same teacher and to expand the interactions and roles of teachers as infants grow.

Mind-mindedness is a relational construct (Barreto et al., 2016; Fishburn et al., 2017) and important for both infant educare and infant teacher education (Helmerhorst et al., 2019). It enables infant teachers to tune in or in synch with infants' thoughts and feelings (Dai et al., 2019) and to contribute to infants' development, happiness, and well-being (Hong et al., 2016). Therefore, we hope that the value of mind-mindedness, which reads and respond to the mind of infants, is recognized in future research, and can be incorporated into daily interactions of infant teachers.

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