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What is This?
The role of joint attention in social communication and play among infants

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Abstract
Joint attention enables infants to communicate with adults as well as with each other, sharing what is in their minds. Yet, communicative competence and joint attention between infant peers have received little attention in the literature. The purpose of this qualitative study was to explore how infants under the age of two within a childcare setting communicate with each other through joint attention and social understanding during daily interactions. Findings indicated that infants utilized various communicative means, intentional pointing, and joint attention in order to share their experience with each other, develop social understanding, and enjoy social joint play. This study also suggests that conflicts between infants can be a fundamental vehicle for developing social understanding and joint play activity.

Keywords
conflict, infancy, joint attention, qualitative research, social play, social understanding

Emma was inside the wooden boat as Alia was crawling past the boat. Emma called to Alia and put her arms out. Alia looked at Emma and then stood up on the side of the boat and climbed in. They began to rock the boat gently, smiling. When a caregiver helped them rock, they began to laugh and smile with each other.

As illustrated in the above anecdote, Alia and Emma, who were 10 months old and 14 months old, did not share many verbal directions to initiate and direct their social play. Yet, they seemed to understand what the other wanted through gestures, gaze following, and direct attention, and thus enjoyed joint social play. This ability to experience shared attention with a social partner is termed joint attention (Mundy and Newell, 2007). Joint attention has been described as ‘two individuals [who] know that they are attending to something in common’ (Tomasello, 1995: 106). Even though infants are capable of engaging in a playful episode, as described above, that requires simultaneous visual attention and social understanding (Carpendale and Lewis, 2004; Slomkowski and Dunn, 1996), the topic of joint attention among infant peers has been afforded very limited exploration in
the literature. This qualitative study aimed to provide thick descriptions of how infants experience joint attention to engage in playful social interactions based on their mutual social understandings.

**Joint attention and social play**

There is a flourishing line of research which beautifully documents the synchronous communication and close relationship between adults, usually mothers, and infants (Stern, 1977/2002; Stern, 2000; Wittmer and Petersen, 2010). As more young children are cared for in the group care, many researchers emphasized the importance of the positive infant–teacher relationship (Lee, 2006). Relationships are considered as an important learning context (Berthelsen, 2009; Lee, 2006). From birth infants are social beings (Carpenter et al., 1998; Stern, 2000).

Infants begin to engage communicatively with adults around two months of age and follow the gaze of the adult around four or five months (Fogel, 2001). Gaze following and eye contact are considered as relationship bonding behaviors since those behaviors would make mothers feel connected to their infants (Stern, 1977/2002). Infants progress from dyadic interactions (infant-other) to triadic social systems (infant-object-other) toward the end of the first year and thus experience the emergence of joint attention (Dunham and Moore, 1995; Saxon et al., 2000). During this particular developmental transition, infants need to learn to ‘coordinate their attention and actions on objects in their environment with the attention and actions of their social partners’ (Dunham and Moore, 1995: 15).

The triadic interaction between a caregiver, an infant, and an object includes gaze following, various gestures and pointing, and joint attention (Carpendale and Lewis, 2004; Tomasello, 1995). As infants should be able to understand the adult’s intentions in the situation in order to coordinate attention and actions on objects, infants would experience joint attention and engage in participatory learning (Brownlee and Berthelsen, 2009; Tomasello, 1995). Thus, joint attention is a highly complex social-cognitive phenomenon (Tomasello, 1995). Learning is influenced and sustained by social interaction with others as well as communication and collaboration in relationships (Berthelsen, 2009).

Joint attention may involve other gestures, such as pointing, showing, or offering. Primarily through looking at mother-child dyads, researchers have argued that infant pointing has various motives; attention getting, protoimperative and protodeclarative functions (Liszkowski et al., 2004). While protoimperative function involves the infant requesting an object from an adult, protodeclarative function involves the infant sharing attention to an object with an adult (Liszkowski et al., 2004). It has been suggested that infants at around 12 months of age can point declaratively (Liszkowski et al., 2004) and declarative gestures are linked to the understanding of intentions (Camaioni et al., 2004). Joint attention is vital to later language development, social cognitive skills, empathy, and prosocial behavior (Mundy and Newell, 2007; Slomkowski and Dunn, 1996; Tomasello, 1995; Tomasello and Farrar, 1986). Although joint attention is a fundamental aspect of social interaction for infants, much of the research on joint attention has focused only on adult–infant dyads, especially the mother–infant dyad. The topic of joint attention among infant peers has been afforded much less consideration.

During the second year of life, infants begin to have more coordinated social actions (Eckerman et al., 1989; Howes, 1983) and also engage increasingly in complementary and reciprocal play (Howes, 1983, 1988). Through interactive play infants have opportunities to communicate with each other, imitate each other, engage in social play, and develop social understanding (Shin, 2010). As Eckerman (1993) argued, coordination of joint play among young peers seems to rely a
great deal on communication achieved through imitation. Even though there is more recent literature on participatory learning in the toddler age group (Berthelsen, 2009), the examination on joint attention between infants during social play is scarce. Considering that the field of infancy has been marginalized (Lee, 2006), this study would provide an important insight into and make a contribution to the field of education.

The purpose of this study was to explore the role of joint attention in infants’ social play and their mutual social understandings. This study addresses the following research questions:

1) In what ways do infants communicate with each other during social play?
2) How do infants engage in playful social interactions based on joint attention and their mutual social understandings?

Methods

This qualitative study was conducted in the infant room, which served children under the age of two, in a university-affiliated child care center in New York City. The data were gathered over the course of one semester, 13 weeks, through non-participatory observations, videotaped observations, and excerpts from infants’ daily communication charts.

Setting and participants

The university-affiliated child care center enacts a flexible, child-centered, and play-based curriculum, guided by an underlying belief that children are competent beings. The center serves children between six weeks and five years in three mixed-age classrooms: infant, toddler, and preschool. This study was conducted in the infant room.

The infant room served a total of eight infants during the data collection period. There were four boys and four girls, between the ages of six weeks to 25 months. For this study, five of the infants ranging in age from nine through 23 months were the primary focus. It was because that infants began to engage in joint attention around nine months and that the purpose of this study was to explore how the infants under the age of two experience joint attention and develop social understanding.

Data sources and data analysis

The data were gathered through non-participatory observations and videotaped observations over a semester, 13 weeks. The non-participatory observations took place in the observation booth adjacent to the infant room through a one-way mirror. The infants were observed six hours per week

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Gender</th>
<th>Race/cultural background</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kevin</td>
<td>9 months</td>
<td>boy</td>
<td>French</td>
<td>5 full days</td>
</tr>
<tr>
<td>Alia</td>
<td>10 months</td>
<td>girl</td>
<td>American and Asian</td>
<td>5 full days</td>
</tr>
<tr>
<td>Katia</td>
<td>13 months</td>
<td>girl</td>
<td>African</td>
<td>5 full days</td>
</tr>
<tr>
<td>Emma</td>
<td>14 months</td>
<td>girl</td>
<td>Asian American</td>
<td>5 full days</td>
</tr>
<tr>
<td>Jake</td>
<td>23 months</td>
<td>boy</td>
<td>Spanish and European-American</td>
<td>3 full and 2 half days</td>
</tr>
</tbody>
</table>
for a semester using a running record. They were also videotaped for 15 minutes per week for six weeks. The field notes and the videotaped segments were reviewed and transcribed in detail. The daily parent–caregiver communication charts were also reviewed and analyzed. Both parents and caregivers utilized these communication charts in dialogue. Since caregivers wrote down daily routines and important incidents or anecdotes during the day, the daily communication charts provided additional information about events taking place when I was not present.

The data analysis process was emergent and qualitative. All of the data were reviewed carefully and the ‘event’ was chosen as a unit of analysis. Using an open-ended coding system, all the selected events were re-examined in order to identify themes that would help me answer the research questions (Marshall and Rossman, 1999).

Findings

An in-depth analysis of the observed and documented social interaction events among the infant participants revealed that infants were actively observing each other and engaging in various communicative gestures. Also, joint attention and imitation were observed to lead to joint social play.

Communication and joint attention

First of all, the infants engaged in various communicative gestures; gaze following, eye contact, joint attention, and pointing. The results highlight that gazing is fundamental for social play. As indicated in the event described below, Kevin would carefully follow Alia visually, utilize joint attention, exchange eye contact, and experience object focused play.

Alia is sitting on the floor and playing with a plastic toy train. Kevin crawls to Alia, looks at the toy and Alia in turn. Kevin picks up the toy train. Alia looks at Kevin, gets up, and walks over to the big green ball. Alia starts banging the ball. Kevin stops playing with the train. Kevin looks at Alia playing with the green ball. Kevin smiles at Alia when Alia looks at Kevin. Then, Kevin scoots over to Alia. Alia and Kevin bang the ball together, giggling. (Observation)

It is important to note here that gaze following is a way to figure out what is going on and to understand each other’s action. Kevin used joint attention skills and tried to play with a toy train that Alia was using. But, when Kevin picked up the train, his possible intention of playing together was not conveyed clearly. Therefore, Alia moved away from the scene and found a green ball to play with. Kevin, who was still interested in Alia, stopped playing with the train and followed Alia visually. After gaze following, Kevin employed joint attention skills once more, exchanged eye contact with Alia, and displayed positive emotion. Finally, Kevin successfully coordinated his play with Alia, such as banging the ball together. Giggling at the end of this event indicated that both infants enjoyed joint coordinated play. In this regard, gaze following can be seen as a basis for social joint play. Furthermore, infants are not merely interested in an object, but more interested in social play using the same object.

Moreover, infant pointing has a clear communicative purpose. As exemplified in the below event, infants point in order to obtain an object from a partner (imperative motive). Alia would point to the peg board that Emma is holding, attempting to obtain the object from Emma. Then, Emma and Alia experienced joint attention (i.e. Emma looking at the object that Alia pointed to), and Emma understood Alia’s intention without any verbal exchange. Alia’s smiling at the end of this event indicated that her intention was well served and recognized by her partner, Emma.
Emma goes to the slide with a yellow peg board. Emma climbs up the steps and stands still to look at Alia climbing up the ramp of the slide. Alia points to the peg board that Emma is holding. Emma looks at the board and then puts the board down on the ramp. Emma pushes the board a little bit in order to let it slide down the ramp. Alia climbs up the ramp slightly, grabs the board, and slides back down, smiling. (Observation)

The following event also illustrated imperative pointing (requesting an object). An interesting insight in this event is that imperative pointing can have a social motive or lead to social play.

Emma is sitting at the table eating cheerios. Emma follows Jake visually as she is eating. Emma drops some of her cheerios while eating and looks and points at them. Jake notices that and picks up the cheerios that fell on the floor. Emma lets her cheerios drop again, and looks at Jake, pointing at the cheerios. When Jake gives the cheerios back to Emma, she smiles at Jake. (Chart)

As described in the above event Emma initially began pointing, which seems like imperative motive, as she wanted to have her cheerios (breakfast cereal) that fell on the floor. But when Jake got her cheerios (breakfast cereal) for her, Emma got excited and wanted to have a ‘give-and–take’ game. Smiling indicates Emma is satisfied with Jake’s response, and we can assume that Emma’s intention to have a ‘give-and-take’ game was communicated successfully to Jake.

In addition, the findings demonstrated that infants were capable of engaging in declarative pointing during peer interactions. As described in the below event, Emma would point to an object, the wooden boat, in an attempt to share her attention to the specific object and to share her interest in rocking and ‘rowing’ the boat. The event described below signifies that infants under the age of two are able to produce and comprehend declarative pointing and to understand each other’s intentions and thoughts.

Emma goes inside the wooden boat. Katia follows Emma. Emma and Katie are sitting inside the boat. Emma then points to the boat, saying, ‘Row, row.’ Katia rocks the boat and her body back and forth and starts to sing the song, Row, row, row your boat. (Videotaped observation)

In sum, infants were observed to utilize various communicative gestures in this study, such as active gaze following, joint attention, and exchange of eye contact. Infants also produced purposeful pointing gestures in order to communicate their intentions. Based on their understanding of each other’s action through gaze following, gaze alteration, and joint attention, infants were able to comprehend the meaning of pointing, either imperative motive or declarative motive, and respond accordingly. In this sense, communicative gestures and joint attention were seen as fundamental components of social understanding and social joint play.

**The power of imitation**

Infants in this study carefully imitate the dynamics of acts they observe. These results emphasized that imitation is a form of social engagement. Infants would imitate others’ actions based on social understanding, such as what a social partner would like to do with a specific object. Manipulation of the specific object concurrently provides a way of sharing the interest of a social partner and enjoying the social play.

Katia and Alia sit at the table for snack. Katia shakes her head side to side and stops shaking and smiles. Alia looks at Katia shaking her head, smiling. Then Alia starts to shake her head. Both Katia and Alia
shake their heads, laughing. Alia bounces her bottom on the chair. Katia looks at Alia, smiling, and follows Alia bouncing her bottom. Both smile at each other. (Observation)

As seen in the above event, Katia was not only initiating the shaking game but also expecting Alia to follow her. This is evident in that when Katia stopped shaking, she waited for a response from her partner, and smiled. Alia shared her attention with Katia and imitated Katia’s action. Then, both engaged in the shaking game together and smiled. Smiling suggests that the infants are pleased with their successful communication in the shaking game. It is also interesting that Alia was adding a variance into their social play, bouncing her bottom, and expecting Katia to imitate her play. Both smiled at each other at the end of the event when their intentions were well recognized by each other. From this point of view, imitation is not reflexive, but purposeful, based on social understanding.

In summary, infants also imitate each other’s actions based on their understanding of the action and their intention through a joint attention process, and thus enjoy joint social play.

The role of conflict in the development of social understanding

Surely infants are enjoying joint play, but their interactions are not always friendly. Infants in this study often engaged in both struggles around objects and physical struggles, such as hitting, pushing, and pulling during their interactions with peers.

Struggles over play materials were commonly observed between the infants as both infants tried to exclam the ownership of a play material, as illustrated in the following event:

Alia pushes the wagon filled with blocks and walks around, holding it. Emma is watching Alia. When Alia stops playing with the wagon briefly, Emma comes to get the wagon and walks around with it. Alia crawls back over to the wagon again. Alia tries to hold the wagon, and Emma pushes Alia away. (Observation-wagon1)

It was found that physical struggles and conflicts over play materials could easily bring an interaction to its end. However, as this study evolved over an extended period of time, it was observed that the behaviors involving conflicts were complex and needed to be understood beyond the simple interest in the ownership of the play material. On closer examination, I argue that conflict is a way to foster social understanding.

As described above, Emma and Alia experienced a conflict when Emma showed her intention of possessing the object through physical movement, hitting, and pushing as Alia came near the wagon. However, since this study took place over the course of a semester, the data also provided insights into how Emma and Alia’s struggles changed over time as they compromised and better saw each other’s viewpoint.

Alia plays with the wagon. When Emma comes near, Alia looks at Emma, trying to go into the wagon by putting her leg inside. Emma tries to push Alia’s hands and body, while Alia shakes the wagon using both hands. Emma stops pushing, looks at Alia, and then walks away. (Observation-wagon2)

Alia walks over to the wagon, goes in and stands up, holding the handle of the wagon. Emma walks over, holds the handle with Alia and says, ‘Hi.’ Alia vocalizes ‘ah- ah-,’ smiling at Emma. Alia then gets in the wagon and looks at Emma. Then Emma starts pushing the wagon for Alia. (Observation-wagon3)

As seen in the wagon 2 event, there was another incident of conflict between Alia and Emma around the wagon. Alia was shaking the wagon with both hands. Emma used her physical force to
push Alia away. Then, Emma looked at Alia and walked away. The wagon 2 event could not be successful partly due to the physical struggles and struggles over a play material, and mainly because Emma could not fully understand Alia’s intention. What did Alia want to do with the wagon? Were both infants claiming the ownership of the wagon?

Later, as exemplified in the wagon 3 event, Alia’s true interest was getting a push in the wagon. After a few tries and conflict events, Emma and Alia did overcome the previous struggles and engaged in more positive joint activity around the wagon. Therefore, conflicts can offer children the chance to gain a better understanding about each other and others’ behaviors, exercise their skills in compromise, and engage in social play.

Discussion

The results of this study help to expand current understandings of joint attention and social understanding by bringing into focus infants’ communicative capabilities and social engagement based on social understanding. Considering that little is known about joint attention and social understanding in infants during their second year of life (Camaioni et al., 2004), these findings provide insights on infants’ minds and implications for practice.

Infants in this present study engaged in effective communication and experienced joint attention during peer interactions without relying on verbal language (Dunham and Moore, 1995; Saxon et al., 2000). First of all, gaze following could be the basis for the development of social understanding. Infants in this study were actively observing each other’s actions with interest and then engaging in gaze alteration and joint attention in order to show their willingness to share their experience with each other. A successful awareness of each other’s intentions developed further as joint social play. This study supports the notion that caregivers should value infant’s own ways of being and engaging with others (Lee, 2006). Active observation can also mean active participation.

Previous researches described that the infants would engage in triadic social systems (infant-object-other) and develop joint attention toward the end of the first year (Carpendale and Lewis, 2004; Saxon et al., 2000; Tomasello, 1995). Infants in this current study were more interested in social partners in a triadic system rather than in an object. Also, the results of this study highlight that imitation is a form of social engagement. The object served as a medium through which they could have an interaction. In this sense, manipulation of objects provides a way to establish the interest of the partner. Based on joint attention, infants imitated a peer’s actions on objects and established a mutually coordinated joint world. During peer play imitation can enhance social engagement (Eckerman, 1993). Considering that joint attention and imitation may consolidate the developmental achievement of social play, caregivers should provide ample opportunities for infants to engage in daily interaction with peers.

Infants point purposefully and intentionally. The results of this study confirmed that infants under the age of two were capable of producing and comprehending imperative and declarative pointing during peer interaction (Camaioni et al., 2004; Liszkowski et al., 2004; Tomasello, 1995). Unlike much research which focuses on adult–infant dyads (Camaioni et al., 2004; Liszkowski et al., 2004; Mundy and Newell, 2007; Slomkowski and Dunn, 1996; Tomasello and Farrar, 1986), in this study during peer interactions infants would point not only to request an object from peers, but also to communicate their intentions and actively direct attention to an object or activity of interest. When an infant would point with purpose and intention, a social partner was able to follow the pointing, attend to something in common, understand the intention of the pointing, and respond accordingly. Therefore, it seems that the social interaction followed by pointing and joint attention must indicate the infants’ capability of understanding the other’s
intention and mind. These findings urge us to recognize joint attention as a social cognition skill and to support infants’ inherent ability to develop and establish various social communicative interactions with their peers.

Another very interesting insight that the results of this study provide focuses on the role of conflict in promoting social competence through its impact on the development of joint attention and social understanding. Infants have many positive social engagements and also get into periods of discord (Kemple, 1991). The results of this study verified that the most common conflicts among infants involve play materials, such as object-possession struggles (Eckerman and Peterman, 2001; Hay and Ross, 1982). These results also highlighted that infants were interested more in a partner’s action on the object rather than object possession itself. The object was found to be a vehicle for infants to engage in interactions. When their intentions on the object focused play were not interpreted by the social partner correctly or successfully, infants would experience conflicts. Through such interaction, infants gradually construct a more complete social awareness and understanding and develop skills required for joint play (Brownell and Brown, 1992). I have noticed how infants’ social interactions could be extended further or terminated by the intervention of caregivers, especially during times of struggle or conflict. Following from this, this study suggests that infant caregivers need to be sensitive to the multiple meanings of behaviors and acknowledge the value of conflict situations in young children’s development of social understanding.

References


