Initial Aspects of Children with Congenital Deafblindness: Development of Mutual Interaction

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Abstract: This research examined the process of two congenital deafblind children (CDB) with additional profound disabilities in developing mutual interaction with others and eventually reaching the stage of "communication" within the educational sessions of a consultation programme. In the initial sessions, the subject (Subject 1) engaged himself in handling and mouthing toys, and did not respond to others. However, in response to "a vocal call" from a partner (A), he exhibited "searching action" and eventually developed a relationship manifested by "turn-taking" and "mutual interaction." Subject 2 had a tendency to engage in "finger flicking" in front of her eyes. When her partner initiated reverberating vocalization "Ah--", vocal turn taking between them commenced. Investigation of these interactions suggests: (1) cues for interaction are based on action initiated by CDB children; (2) the use of vocal calls and acceptance directed towards children creates opportunities for interaction; (3) the basic motive for the development of interaction is searching action; and (4) mutuality in the interaction eventually expands to turn taking and appealing to the partner. The relationship with interaction partners can be categorized into; (a) "contacting" and "sharing"; (b) "attachment" and "approach"; (c) "exploration"; and (d) "dialogue" and "mutual interaction."

Key Words: Deafblindness, CDB, mutual interaction, communication

In the case of children with congenital or early onset of deafblindness (CDB), the more profound the disability, the more difficult is communication and interaction with caregivers. Not only do CDB children rarely display their feelings, but also the frequency of their response to the action of others is low. Therefore, a central issue in communicating with a CDB child is the creation of an active response (appealing action) in the child to the interaction partner. This study investigates how an interaction partner should respond to actions initiated by the child. Through the partner's response to the child's actions, the child understands that she/he is accepted and experiences joy at being able to initiate subsequent actions. This sense of joy, it is suggested, motivates the child to approach others.

The partner response to the actions of the CDB child start in resonance. No matter whether the child's actions are simply reflective or intentional, motor movement, a simple verbal utterance, or expression of emotion, the child and his partner should make contact and develop a relationship. Through the child's physical movements (both subtle and overt), such as shaking of the body, clapping, putting fingers together, as well as activities such as rolling a ball, or trampolining, the partner should pursue the child's actions, participate in the activity, and motivate interaction between them.

In the educational guidance of The National Institute of Special Education (NISE), we have contact with not only CDB children, but also children with other disabilities. How to initiate a response in these children and develop that response into a mutual interaction was a primary aim of this study, together with how to expand the child's relationship with inanimate objects. The data for this investigation was collected from interactions with two CDB children (Subject 1 and Subject 2). Interaction data were recorded on video, and based on this information each child's interaction history is described in episodes. Also included are photographic data (see Note 1). Data collection occurred during educational guidance sessions conducted in the playroom at NISE with the child's guardian present. Sessions were held weekly, or every two weeks, and were from 60 to 90 minutes in duration.

Record of Episodes

Interaction with Subject 1

This boy was born in January 1990, and is currently in the third grade of an elementary department of a school for the blind. He has enough vision to reach for snacks and toys within his grasp, but has profound hearing loss. At exactly age two, his vision was tested on a visit to Attached Child Educational Guidance Clinic. Since age two years and eight months, he has received regular weekly sessions each one lasting for approximately 90 minutes.
Interaction between Subject 1 and Others

Subject 1 actively reached for toys and eating utensils although he tended to spend time simply handling them, or putting them into his mouth. Despite the fact that his interaction partners (the researchers in this study, and referred to here as A1 and A2), continued physical interaction, Subject 1 did not respond by touching and searching for As hands or body. When A increased direct guidance using a variety of actions, including motion signals, the subject often withdrew his hands. In sessions held during the final 12-month phase of the study, the subject began to touch A's hand, mouth, and face.

i. Episode 1 (6 years 8 months)/ Part 1: Subject 1 touches A2's face and places hand in A2's mouth

Subject 1 lies flat on a chair in the entrance lobby, facing upward. A2 approaches, stooping somewhat, and addresses the subject while looking at him. The subject is sucking his right finger and occasionally shakes his head from left to right. A2 places his hands at the subject's sides and slowly raises his upper torso. With the subject's posterior on the chair, A2 supports the upper torso to make him sit on the chair. A2 kneels in front of him, face-to-face, and supports him. Subject 1 still has his fingers in his mouth. Positioning his face directly in front of the child's face, A2 breathes on him drawing his voice out in a long breath, "Oh---i." Subject 1's non-engaged left hand slowly reaches for A2's face and touches his cheek. A2 continues talking using a drawn-out breath. Subject 1's right hand now leaves his mouth and moves directly in front of A's face. As his hand touches A2's nose, he searches around the nose with his fingers. His hand gradually lowers until it touches A2's mouth. At the moment his fingers enter A2's mouth, the child smiles and his right hand moves from A2's mouth back to his own. At the same time, his left hand comes forward and searches around A2's mouth as done previously with his right hand. Initially his left hand searches around A2's lips and is put into A2's mouth (see Figure 1). His outstretched fingers move inside A2's mouth. While holding the subject's fingers between his teeth, A2 utters a word a little more strongly than before. The subject's hand withdraws, and the right hand reaches out to slightly touch A2's nose and mouth, and is withdrawn again. The right hand returns to his mouth and his left hand is placed on A2's right hand that is helping to support him. The child's movements stop momentarily and he shakes his head from left to right. A2 realizes that the subject has finished his exploratory action of his face, and asks him to stand up. A2 gently raises the child's upper torso with his hands supporting him at his side. As the subject places his weight on A2, A2 pulls the child to his side to match the child's movement and supports the child so his legs can extend. The child then touches the floor on his tiptoes and extends his legs, standing firmly with the help of A2. The session now goes to the next scene of moving into the playroom.

![Image](1996_10_7.png)

**INSERT FIGURE 1**

Analysis: The interaction began with A2 supporting the subject while at the same time looking directly into his face and calling out his name in a long drawn-out breath. Subjective assessment of the subject's hearing ability makes it likely that he could not hear A2. Yet at the same time, he could sense A2's facial expressions, vibrations, breath, movement and muscular tension of supporting hands and arms and knew that it was A2 who was looking into his face, supporting his body and was talking to him. Subject 1's hand was raised and slowly approached A2's cheek and touched it. The hand may have been lowered to check whether A2 was there or not. A2 did not remove the child's hand from his face, nor guide it, but waited for the child's actions to develop. At the same time, he continued to slowly call out the child's name. The child's hand that was in his mouth was extended to touch A2's face. His hand touched A2's nose and mouth, and was then placed in A2's mouth. This was the commencement of a "search move."

ii. Episode 2 (6 years 9 months)/ Part 2: Subject 1 touches A2's face and places hand in A2's mouth

Subject 1 lies on a trampoline looking at the ceiling, his right hand in his mouth while his left hand is on his face as if to cover his eyes. Until now,
when presented with toys or having his name called, he displayed no sign of wanting to respond. The covering of his eyes could be that he does not seem to be paying attention to the outside world. A2 now assumes the role of an interaction partner and faces the child. He calls the child's name several times and moves the trampoline surface, but the child's hand remains on his face. Subject 1 does not seem to know that his interaction partner has changed. A2 now lightly taps the child's knees and continues to tap his abdomen as if he is calling to the child. Finally, the expression on the child's face softens and his right hand leaves his mouth. Both hands are extended to receive A2's hands. A2 now lightly taps the child's palms as if he is receiving the child's hands (see Figure 2). Then A2 holds the child's hands and exhales into the child's hands. When A2 releases the child's hands, the child moves his hands in front of A2's face, touches it with both hands and explores around A2's lips. When A2 utters a vibrating, "Wha--, Wha--," the child's hands come to A2's mouth. A2 takes the child's hands and breathes onto his palms as he continues to talk. The child's right hand returns to his own mouth once again. A2 takes the child's left hand and moves it to A2's throat. A2 continues talking while making vibrations in his throat. A2 moves his face closer to the child's and makes his chin approach the child's right hand that is well inside his mouth. A2, while continuing to talk, pushes his chin several times against the child's right hand. While the index and middle fingers of the child's right hand remain inside his own mouth, the child's ring and little fingers juggle and search A2's cheek. When A2 stands up and moves his face away from the child's face, the child's right hand leaves his own mouth and stretches out to pursue A2's face that is moving away. The child has a serious countenance and it is obvious that his attention is now on A2. When A2 positions his face near that of the child, the child starts touching A2's nose, mouth, and chin with his right hand. When A2 utters, "Oh--i," "Oh--i," the child puts his hand into A2's mouth. His fingers reach to back of A2's mouth and touch A2's tongue and teeth. He starts scratching the inside of A2's cheek with his fingernails. A2 makes a decision to observe the subject's action and allow the child to freely explore the inside of his mouth. When the child's hand reaches A2's throat, however, A2 "pays" and he moves his face away just a little. At that moment, the child withdraws his hand and it goes back to cover his face, and presses his eyes. The window to the child's outside world, which opened briefly, now appears to have been firmly shut once again.

Analysis: The interaction started with the placing of A2's hand on the abdomen of the subject who was, at that time, lying on his back. The "dialogue" between them started when the child put his hand on top of A2's hand, and A2 tapped it as if he were holding it. A2 then lightly blew onto the child's hand. The child moved both hands to A2's lips and explored the area around them. A2 made vibrations with his voice and breathed onto the child's palms as if he were talking to them. A2 again made vibrations with his voice inducing the child's hand to make contact with A2's throat. The child's hand then, spontaneously, moved inside A2's mouth. The child's action of inserting his hand into A2's mouth was, we believe, of his own volition as was his decision to ardently and actively explore A2's mouth. The dialogue between them progressed as A2 responded to the child's actions as if he were prompting the child's searching action. A2 patiently waited for the child's responses so as not to inhibit his action in any way, even when any action was not forthcoming. Then A2 had to move his face away from the child. At that moment, the child's hand left A2's mouth and the child covered his own face. It is suggested that this was an actual response to A2's action. A2 was just not an inanimate object for the child. In the mutual relationship that had been established in which the two were pulling against each other (approaching each other), the child sensed the will of A2 to terminate the interaction by moving away and, thus, the child terminated his approach to A2 and his hand returned to cover his face. This indicates, it is suggested, that the child's action was part of a "bi-directional approach relationship" between the child and A2.
iii. Episode 3 (7 years 3 months): Subject 1 holds Al’s fingers between his teeth

Subject 1 sits cross-legged on the floor and plays with toys. He then lies on his back and repeatedly puts his right hand into and out of his mouth. After wiping the child’s wet hand with a towel, Al rubs or massages the child’s right hand. The child does not appear to dislike this and allows Al to continue rubbing. The child then withdraws his right hand and puts it into his mouth. When Al signals by lightly tapping his left hand and saying “Do you want the same for your other hand?” the child stretches out his left hand. Al continues massaging the back of the child’s left hand, palm, and fingers.

Al blows onto the back of the child’s left hand, then onto the child’s palm. The child releases a low laughing utterance, “Goo, goo, goo—.” He lightly touches his slightly flexed knees together and this action expands throughout his body. The child moves his hand from Al and shakes it in the air. Al then moves his mouth close to the child’s hand and breathes onto it. The child’s left hand becomes further active and moves as if searching for Al’s face. Al moves his face close to the child’s hand and the child touches Al’s mouth and then moves his hand around his nose as if exploring. Al continues exhaling. The child then searches around Al’s mouth with his right hand and moves his hand to Al’s nose and cheek. His hand then returns to Al’s mouth and is stationary. Meanwhile, the left hand has remained motionless.

The child puts his left hand inside his own mouth. Then Al takes the child’s left hand and breathes onto it. The child touches Al’s forehead and gently taps Al’s head twice with his left hand. The hand then leaves Al’s head and hangs in the air motionless as if it were lost. Then he moves his hand to his own forehead, removes his right hand from his mouth and moves it to Al’s lips. The child’s hand is soaked in drool, so Al wipes it. The child’s hand touches Al’s mouth, rubs his cheeks, and repeatedly taps his forehead and head, and the returns to his own lips. Then the child releases a loud utterance, “Ah—,” and his body shakes. The child takes his hand out of his mouth, shakes it near Al’s mouth, and waits for Al to breath onto his hand. This time, the child does not put his hand into Al’s mouth.

The child puts his hand back into his mouth and then taps the floor with his left hand. In response, Al taps the floor, the child taps and Al taps in return. Turn taking of floor tapping commences. The child stops tapping with his left hand and his other hand comes up to explore Al’s left hand, wrist, and arm. The child touches near to Al’s wristwatch and rubs the area. Al adds variety to his wrist movements by circling, weakening or strengthening his touch. Al then lightly massages the child’s chest as he lies on his back and then moves his hand smoothly to the child’s lips. The child grabs Al’s hand, moves it to his lips, and licks Al’s fingers. He then holds Al’s fingers between his teeth and bites them with increasing strength. Al’s response is “Ouch!” When Al withdraws his bitten fingers, the child licks Al’s hand and touches his chin and mouth with his right hand. The child laughs loudly, and his body shakes as he lies on his back. He then quickly leaves, crawling on his back and biting his fingers.

Analysis: When Al rubbed the child’s hands or lightly tapped them, Subject 1 presented his hand to Al. The child did not dislike the rubbing or massaging of his hands. Nor did he dislike finger play, but it can also be said that the child’s hands passively received Al’s actions. Meanwhile, the child sensed Al’s breath on his hand, his hand suddenly became active and its movement expanded to include Al’s lips, nose, cheek, forehead, and head. The child, for the first time, tapped Al’s head, but in this scene the child’s hand did not enter Al’s mouth. It is possible to interpret this as the child expanding his search from Al’s face to his head, but it is also possible to say that the wiping of drool from his fingers prevented the child from putting his fingers inside Al’s mouth.

The child tapped the floor with his left hand and Al repeated the action, and the child responded in turn. The interaction developed into turn taking. In this flow of events, the child came to explore Al’s wrist. Al added variety to his wrist movements and muscle tension, and the child continued to grab Al’s wrist. Al placed his hand on the child’s chest and
moved his fingers to the child's lips. The child showed his tongue and licked Al's fingers, then held them with his teeth, and bit strongly. Al allowed the child to bite, but then expressed his pain and withdrew his fingers from the child's mouth. The child continued to lick Al's fingers and searched around Al's lips with his right hand at the same time laughing loudly. Although the child exhibited a variety of actions, including floor tapping, exploration of Al's hands and fingers and the holding of Al's fingers between his teeth, both Al and the child shared action. We refer to this flow of actions as a "dialogue." In the flow, the child licked Al's fingers for the first time, held them between his teeth, and bit. He then laughed. We interpret this as an expression of Al's acceptance by the child.

iv. Episode 4 (7 years 4 months): Subject 1 explores his and Al's mouth with his fingers
Subject 1 is lying on a trampoline, facing upwards. Al signals "play" to the child's hand. He begins moving the trampoline mat. The child's hand reaches out to Al's hand and Al moves his mouth close to the child's hand, and begins breathing onto it at the same time as saying his name. The child gently touches Al's lips and nose and moves his hand forward to touch his forehead. When the hand reaches Al's lips, Al moves his chin while making a rattling sound. The child then caresses Al's lips and, in turn, Al touches the child's lips and teeth. The child shows no sign of movement in his lips. Now the child touches Al's lips with his right hand while Al touches the child's lips with his right hand (see Figure 4). The child's right hand leaves Al's mouth and moves to his own, but leaves immediately to touch the fingers of Al's right hand, then Al's lips, and then they return to their original position. Al utters the cry "Awawa-" and transmits vibrations onto the child's right hand while gently moving the child's lips. The child removes his hand from Al's mouth and touches Al's fingers that are touching his lips. The child grabs Al's fingers and starts rubbing them repeatedly.

Analysis: Subject 1 grabbed Al's hand. Al moved his mouth towards the child's hand and blew onto them as he talked. The child touched Al's mouth and nose, and expanded these movements to the whole area of Al's face. When the child's hands reached Al's lips, Al shook his chin in a wide arc. The child caressed Al's lips. Each of Al's "acceptances" of the child's action (and their changes) made this sequence of communications a dialogue. Experience enabled Al at this time to decide to touch the child's lips with his hand and send him a signal by lightly touching them as the child's hand was touching his lips. This means that Al established a "reflective" relationship involving the child in response to the child's actions to Al. Such a reflective relationship has potential to develop into a circulatory dialogue between the child and Al.

v. Episode 5 (7 years 6 months): Subject 1 clasps A2's hands.
Subject 1 is lying on the floor facing upwards. After playing with several toys, the child reaches to grab A2's fingers when A2 holds his hand in front of the child's eyes. From that point onward the child exhibits a series of communicative actions such a grabbing A2's fingers, touching A2's lips, searching for lip vibrations accompanying A2's utterances, and moving his feet to A2's throat and chest to sense the vibrations from A2. This form of communication continues for a while, and then A2 stretches his hands before the child's eyes as well as accepting the

INSERT FIGURE 4

INSERT FIGURE 5
child's feet on his chest. The child then touches both of A2's hands (see Figure 5). He grabs A2's hands, entwines his fingers with those of A2, and occasionally pinches A2's toes. As this happens, the child continues the communicative action of clapping his hands against A2's hands.

Analysis: Subject 1 grabbed A2's fingers shadowing his eyes. The child felt the vibrations of A2's voice with his hand and the vibrations of A2's throat and chest with his feet. In this sequence of actions, the child started to clap his hands against the outstretched palms of A2. Then, while touching A2's hands, entwining his fingers with his, and pinching his toes, the child continued clapping against A2's palms. It is suggested that this action is an expression of the child's desire "to adjust" to A2's actions as opposed to exploratory actions such as searching or ascertaining. In brief, this action is a voluntary adjustment by the child to his partner's actions.

Interaction with Subject 2

Subject 2, a female, is currently a third grade student in the junior department of a school for the blind. She has fetal rubella syndrome and her left eye has a slight light perception. Since childhood, she has engaged in hand flapping over her eyes. Hearing has been assessed at approximately 80dB for both ears. She has rung a bell close to her ears since childhood. Since those early childhood days, she has consistently taken off her hearing aid after wearing it for only a short time. At present, she usually does not wear it. In addition to her visual and hearing disabilities, she has a small head and disabilities in her toes and heart have been detected. Since entering the third grade of the elementary department she has regularly attended sessions on a monthly basis at the clinic. After entering the junior department the frequency of these visits has increased from one to two times a month.

Interaction between Subject 2 and Others

It is not easy for an interaction partner to develop "communication" with Subject 2. She and her partner eat snacks together, jump on the trampoline together, and sometimes listen to music together, and the partner massages her hips and shoulders. When coming on to the trampoline, Subject 2 gestures with a signal such as "Start," "More," or "Play," and responds to the signal "Stop." She also grabs hold of her partner's hand so that they can jump on the trampoline together. Such communication is possible, yet her actions are simply repetition of Subject 2 initiating her requests (i.e., they are limited to trampolining and shoulder massage), but stop short of mutual interactions and "dialogue."

- Episode 1-1 (12 years 3 months): Subject 2 enjoys vocal turn taking.

In the playroom, Subject 2 jumps on a trampoline, eats snacks, and listens to music from a cassette deck player. One hour and 10 minutes pass. She is handed an iron bar, approximately 30 cm in length (an object cue for a cradle-type swing with two benches facing each other which is located outside in the corridor). Subject 2 heads towards the playroom exit and changes her shoes with assistance. She takes the iron bar from A1's hand, goes out into the corridor, and makes for the seesaw swing while holding A1's hand in her other hand. She goes along the corridor, locates the swing, and gets on unaided. A1 sits opposite her and guides her to grasp hold of the railing. While lightly tapping her knee as a signal, A1 pushes the swing as he counts.

When the swing begins to move, the child utters a low "Ah-..." as if she is growling. A1 continues to push while counting to 20. He then takes her hand and signals to her that the swing is over. When A1 stops pushing the swing, the child stops growling. Her hands, which up to now have been holding the rail, now start to search for A1's hands. She draws the signal "More" on his hand. Swinging restarts and the Subject begins her growl once again. A1 takes the child's hand and it moves to A1's throat. A1 utters the sound "Ah-..." himself. Subject 2 stops her vocal display and listens to A1's voice. She then starts the sound once again. They then sit facing each other while her hand remains on A1's throat and his hand is on her throat. Subject 2 utters a low "Ah-..." again, and A1 utters a high pitch "Ah-..." in re-

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**INSERT FIGURE 6**
sponse. The child listens and utters a low "Ah-" again. A1, once again, utters a high pitched "Ah-..." In repeating these actions, the two engage in taking turns in voice utterance. Subject 2 laughs.

ii. Episode 1-2 (14 years 10 months): Subject 2 enjoys vocal turn taking.

Subject 2 eats snacks during the session. When offering Subject 2 snacks, A2 shows her a snack bag (an object cue) and vocally invites "Do you want to sit on a chair and eat at the desk?" Subject 2 usually accepts the invitation. A2 places a snack box on a tray in front of the child. She opens the box and eats some of the food inside. A1 withdraws the tray and observes her reaction. She swallows the food in her mouth at present, sits upright, and stretches out her arm. She starts eating again. Such "communication": over the food in her snack box is repeated several times. Then Subject 2 begins to enjoy different shades of light by moving her fingers before her eyes. Her arms do not move towards the food, yet she does not stand up from her chair. A1 decides to wait being prepared to respond if the child does stretch out her hand. She shades her eye with her hand, sometimes flipping it. Then she starts uttering "Ah-..." Immediately, A1 responds with "Ah-..." and after a brief interval she says "Ah-" once again. A1 responds with "Ah-i" in imitation of her intonation and emphasizing her vocal tone as much as possible. Immediately following A1's voice, she utters "Ah..."

and A1 responds with "Ah-i." She then responds with "Ah-..." but this time much louder than on previous occasions. A1 increases the volume of his utterances as well. She then responds with a louder "Ah-..." and A1 responds in turn. This vocal turn taking continues for a while and the Subject falls silent. In this period of silence she flaps her hand before her eyes and then stops. While looking slightly upwards, she appears to be thinking. Her foot is touching A1's foot and is moving slightly as if exploring A1's foot, or rather A1 as a person. A1 adds a vocal response "Yes. It's a foot," and moves his foot a little, returning the signal. Subject 2 withdraws her foot, changes her posture, and starts to say "Ah-..." again. This time her voice is unique. It is a long utterance and gradually fades out, and is reminiscent of vocalization she has made in the past. A1 responds in a similar voice and she replies with "Ah-..." but this time with stronger intonation. A1 attempts to follow her utterance. Her expression relaxes and she looks calm. She utters the sound once again, and then turn taking from here on continues for approximately twice as long as the earlier exchange. Gradually the sounds become louder. How long will this exchange continue? Subject 2 seems to be not using the same voice twice, and adds subtle alternation to her voice, seemingly as if she is exploring her partner's reactions. When the turn taking appears to have peaked, her voice gradually quietens, and A1 responds likewise. Soon the turn taking returns to a steady calm state.

Analysis: When Subject 2 started uttering the quite cry "Ah-..." A1 began uttering similar sounds. In Episode 1-1, A1 took the subject's hand, moved it to his throat and uttered "Ah-..." In Episode 2-1, as soon as the subject uttered a sound, A1 responded with "Ah-i," and after a brief interval, she uttered "Ah-..." In Episode 1-1, A1 commenced his vocal response simultaneously with the subject's vocalization while imitating (or mirroring) her. Subsequently, the subject stopped her vocalization and listened to A1's voice. She then vocalized once again. In both episodes, A1 uttered imitations of the subject's cries, and as a result, the subject stopped making sounds, listened, and then began uttering her cry again. This "communication" transformed into turn taking, and in addition, Subject 2 created variations and A1 tried to adjust his vocalizations to these variations. The two created a flow of actions in unison.

Integrating Analysis

As reported here, in sessions held with both subjects (Subject 1 and Subject 2), a variety of interactions with partners (A1 and A2) were generated. Since individual episodes have already been reviewed, the following is a systematic analysis of these observations from several perspectives.

The First Step Towards Interaction: "Acceptance"

The first step toward interaction with children was found in actions initiated by themselves; that is, physical movements exhibited by them. Many researchers involved in the education of CDB children have pointed this out.

By "accepting" actions initiated by children (e.g., utterances and movements), interactions advanced. Therefore, how "to accept" these actions is an important issue for consideration. The classification of "acceptance" can be based on the following categories:

a) Accept as a response - "Yes, I understood." (Subject 1. Episode 1).
b) Accept while imitating - "You are doing this." (Subject 2. Episode 1-1 and 1-2)
c) Accept while offering variations - "How about doing this?" (Subject 1. Episode 4).
The First Step towards Interaction: "Calling"

As a first step towards interaction with Subjects 1 and 2, it was found important to invite their response while "calling," as well as through vibrations and exhaling (see Subject 1, Episode 1). Neonates have been found to express interest in "the face of a person" as an object to see, and in "the voice of person" as something to listen to. They have also been found to make first contact with the skin of their caregivers. In the sessions reported here, there is room for improvement in "calling" through the use of skin contact or touch.

Child's "Exploratory" Actions as a Driving Force for Interactions

The driving force for interactions is thought to be "exploratory: actions initiated by the child. Since these exploratory actions, along with "asserting" actions are exhibited in balance between approach to and avoidance of the partner, they should not be controlled by actions leading to the child’s avoidance. The responses in the present investigation to "exploration" were:

i. To share the child’s exploration by accepting it in its offered form and cooperating if possible (see Subject 1, Episode 2);
ii. To "accept" the child’s exploration while at the same time, inviting the child to expand it (see Subject 1, Episode 2).

Expansion of exploratory actions were primarily seen in expansion of the targets (i.e. the body parts of the partner as in Subject 1/Episode 3), as well as in expansions by means such as exploration using not only hands and fingers, but also feet and tongue (see Subject 1, Episode 3). On many occasions, there was a deepening of the quality of exploration.

Situation Inducing Mutual Interactions: Turn Taking

Turn taking in this context refers to situations marking the beginning of mutual interaction. There are four types of turn taking considered here:

i. Turn taking by imitation or mirroring (see Subject 2, Episode 1-1 and Subject 1 Episode 4);
ii. Turn taking by overlapping interaction (see Subject 1, Episode 3);
iii. Turn Taking by repeated follow-up (see Subject 1, Episode 3 & Subject 2, Episode 1-2);
iv. Turn Taking by the creation of variation.

Relationship from the Child’s Perspective

It is possible to categorize the relationships the subjects had with their partners as follows:

i. Contacting and sharing (see Subject 1, Episode 1);
ii. Attachment and approach. For example, clapping against the partner’s hands (see Subject 1, Episode 5);
iii. Exploration (see Subject 1, Episodes 2, 3 & 4);
iv. Dialogue or mutual interaction (see Subject 1, Episode 4).

One of the four phases emerged as the main theme in some scenes while a few phases were intertwined in a complex manner on other occasions. To understand which phase a relationship in a certain scene should be categorized is important in improving the accuracy of the "reading."

What is Transmitted to the Child through "Dialogue-like" Interactions?

Mothers actively talk with their newborns, but even if they intend to send their child messages in the form of the spoken word, children are unable to understand their literal meaning. What is transmitted in prosody, however, is the mothers emotions and intentions, and Fernald (1992) has categorized these as: (1) to direct the child's attention; (2) to praise; (3) to stop an activity; and (4) to provide peace of mind. Many of the dialogue-like interactions reported here depended not only on hearing and sound, but also on touch and other actions. Even in touch, or related actions, similar prosody to what is actually transmitted to children should be considered. The deepening of the quality of the communication requires the sharing of emotions and intentions. What kind of dialogue-like interaction can transmit emotion and intention through touch and related action? To answer this question from a quality perspective is an issue that needs to be addressed in understanding our relationships with CDB children.

Note: The use of all photographs used in this study has been done with the approval of relevant parents or guardians. We would like to express our appreciation for their support.

References