



How an Intervention on the Bodily Tactile Modality Can Improve Communication

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Abstract

Introduction: In this case study, performed in a home situation in Zambia, it was assumed that the child with congenital deafblindness had too poor vision to access sign language without support by the bodily tactile modality. The aim was to explore if a theoretically based intervention on Communicative Relations with a role model who demonstrates communication in the bodily tactile modality and builds on knowledge and competence in sign language can improve bodily tactile aspects of communication between the child and her mother and brother. **Method:** This study has a qualitative single case study design, which enabled a close analysis of the communication between the child and her mother and brother, by a reflective team. Four members of the reflective team provided insight into the videorecorded episodes in home situations such as bathing and play. Data analysis took place before and after the intervention. The intervention was performed by the researcher as a role model, who is a mother herself, and well trained in the Diamond Model and Dialogical Model underlying the theory of Communicative Relations (Nafstad & Rødbroe, 2015). **Results:** The results demonstrated that the intervention with the application of aspects of the Diamond Model was effective in face-to-face interaction, gestures and social interaction, and the application of aspects of the Dialogical Model enhanced the ability to reciprocate signs during the interaction. The findings in this study clarify how use of sign language and hand positions can benefit persons with CDB to improve their communication. The study has shown how competent mother and brother were communicating with the child after intervention using ZSL, reciprocation and imitation and hand positions. The utterances that were addressed by the child to the partners in gestural expressions were answered by the partners. Lastly, it has shown the need to focus on whole-body communication, understanding, and relating to communicative expressions. **Conclusion and discussion:** It can be concluded that

the intervention had indeed a positive effect on a variety of bodily tactile communication aspects between the child and her family communication partners. The role model approach that was used in this study enabled mother and brother and child to learn through reciprocation of roles and imitation. It is a natural form of learning which does not necessarily require shared reference to theoretical concepts. In addition, the study showed that only sign language is not enough. There must be a connectedness between signing and adapted interaction patterns.

Keywords

congenital deafblindness, reciprocation and imitation, role model intervention, bodily tactile modality

Introduction

This study was motivated by the need for more knowledge about interventions that can contribute to solve the communication barriers between children with congenital deafblindness and other people in their respective home communities in Zambia. Janssen and Rødbroe (2006) describe congenital deafblindness as a complex variation of deafblindness with onset before language acquisition. When deafblindness is present from birth or has an early onset before language acquisition starts, the notion of congenital deafblindness (CDB) is used internationally in the educational field (www.deafblindinternational.org). CDB hinders the development of a basic reciprocal and sharable communicative way of relating to the world through vision and/or hearing. Access to communication supported by the bodily tactile modality is especially important for children with congenital deafblindness as their potential for language learning is not likely to develop without such access (McInnes & Treffery, 1982; Foote, 2018; Forsgren et al., 2018).

Ainsworth (1967) found that typical infants in Uganda have good attachment relations to their mothers and are privileged in sensory motor development. The caretaking environment for a child with CDB who lives with the family in a home community in Africa may also benefit a child with CDB, as Andersen & Rødbroe (2000) pointed out from her experiences in Uganda. An African mother can sweep, cook, wash clothes, and fetch water while carrying a baby on her back. The stable and long term practice of carrying infants and toddlers at the back gives the child possibilities for what Gregersen (2018) calls body-with-body alignment with the caretaker's body. Gregersen (2018) claims that this is a favorable

perceptual position for a child with CDB making it possible that attachment, joint attention and communication become more precise. A child with CDB in Africa may therefore have developed the basic relatedness to the environment which according to Nafstad & Rødbroe (2015) are prerequisites for developing communication further in- or with support of the bodily tactile modality

This study approaches communication from a relational bodily-tactile point of view, in line with guidelines on congenital deafblindness and communication (Janssen et al., 2003; Nafstad & Rødbroe, 2015). Within a shared bodily- tactile conversation space a person with CDB can use the physical space and his own body, others' bodies and physical objects to express what he is thinking about on a certain moment (Godø, 2018). For example, a child with CDB may locate a cup and give it to a communication partner to communicate the need for a drink, locate and lift any piece of cloth to communicate the need for warm clothes, dip the hand of another person in water to communicate the need for bathing or swimming, may touch her stomach while displaying an relaxed face to communicate stomach pain. Persons with CDB can create bodily-tactile mimetic and iconic gestures (Vege, 2009; Nafstad & Rødbroe, 2015, Souriau, 2015; Forsgren et al., 2018; Godø, 2018; Foote, 2018). The sign locus can be located where the child felt the impression of an action, and a sign can be performed as perceived from a tactile perspective (Forsgren et al., 2018). The knowledge and competence which is required to develop communication from the already existing interaction is therefore more than tactile sign language and Zambian sign language. The communication partner must recognize how the child expresses experientially based highlights and be able to map tactile sign language on to the child's gestural expressions (Souriau, 2015; Foote, 2018).

Problem Statement and research questions

The study assumed that the child in focus has developed the relational and gestural prerequisites for developing communicative relations further and that her vision is too poor to access sign language without support by the bodily tactile modality. The aim was to explore if an intervention with a role model who demonstrates communication in the bodily tactile modality and builds on knowledge and competence in sign language can improve the communication between a child with CDB and her mother and brother. The main research question was: To what extent can a role model approach improve aspects of communication in the tactile bodily modality between a child with CDB and her mother and her brother. The sub-questions were formulated as follows:

1. What kind of communication aspects (such as bodily tactile gestures, signs, vocal expressions, and spatial elements) are used in daily life situations in mother- child and brother- child communication before intervention?
2. In what way does the intervention have an effect on the bodily tactile aspects of

communication of the mother's and brother's communication with the child?

3. In what way does the intervention have an effect on bodily tactile aspects of communication of the child's communication with her mother and brother?

The study was assumed relevant in relation to children with combined visual and hearing impairment and CDB who need a bodily tactile communication approach to develop communication further. Earlier research in the deafblind field is performed on communication but a role model approach was never investigated. It was also assumed that the study could throw light upon the use of a role model in early intervention.

Theoretical Framework

Congenital deafblindness in relation to communication development and the bodily-tactile modality

CDB hinders children and their family members in developing basic reciprocal and sharable communicative ways of relating to the world, and studies from the practical field show that early and basic intervention and adaptations should focus on interactional prerequisites for social and communicative sharing and intersubjectivity (Janssen & Rødbroe, 2007; Nafstad & Rødbroe, 2015; Damen et al., 2015; Wolthuis et al., 2019). The bodily-tactile modality can be non-impaired in children with CDB. The bodily tactile modality can support or compensate impaired distal senses in basic communicative interaction such as turn-taking, reciprocation and imitation of actions, signs and conversational roles, and in directing, following and sharing attention (Janssen & Rødbroe, 2007; Nafstad & Daelman, 2017) The bodily-tactile modality can also be used to develop or support deictic pointing (Souriau, 2015), stay in conversational contact, negotiate sharable tactile signs that come from the child's own gestures (Godø, 2018; Forsgren et al., 2018) and give perceptual access to conventional signs and culture (Gregersen, 2018)

A conceptual framework for improving basic communicative relations

Nafstad & Rødbroe (2015) designed a conceptual framework which can guide video- analysis and intervention that improves basic reciprocal communicative relations in face-to-face interaction. The framework can be used to discover which basic reciprocal interactive relations are in place and which are in the process of forming and needing particular scaffolding support in the individual case. The core of the conceptual framework is illustrated as "The Diamond", Figure 1 below. The model focuses on mutual and reciprocally directed attention between the child and the communication partner and has two basic layers. The most basic layer is social- interactive play relations, attachment- relations with co-regulation of emotional distance to the caregiver and co-regulation of access to a secure base while the child explores aspects of the world. Repeated

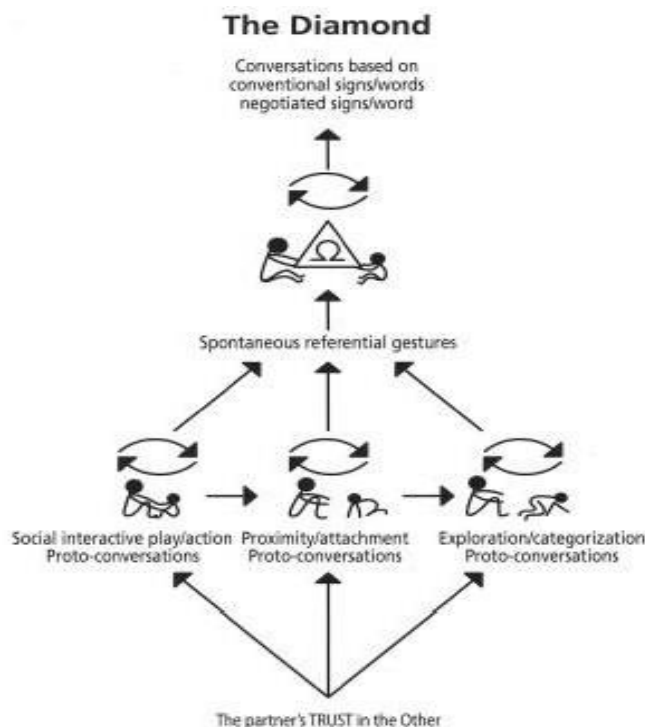
interactional experiences within these environmental relations can lead to spontaneous gestures from the child. Such gestures can have linguistic qualities and be negotiated into shared signs (Forsgren et al., 2018). This negotiation requires the conversational interaction pattern placed on top of “The Diamond” in Figure 1. Participation in conversational interaction must be scaffolded in a planned manner to make use of the sharable bodily-tactile modality. The conversational way of interacting is reciprocal. This means that a gesture from the child can be negotiated to function as a shared home-sign. It also means that a conventional sign presented by an adult or a peer can become a sharable tactile sign.

Nafstad (2018) developed an additional model called “The Dialogical Space Model“, This model conceptualizes in more detail how an utterance can be directed to oneself in the thinking position, to the other person in the position of listening to the talking other, or in the position of talking to the listening other.

Godø (2018) used this model to find out that a child with CDB had many utterances addressed to himself which were not seen by the partner and which therefore were not reciprocated and related to as potential signs, even if the partners were in conversational contact. Likewise, there could be conventional signs by the communication partner which are not made sharable even if there is sharable bodily-tactile conversational contact.

Figure 1.

The Diamond Model



Note. Taken from Nafstad & Rødbrøe (2015).

Bodily-tactile communication practices

An important issue in bodily-tactile communication is how hands are connected. The hand-over-hand and hand-under-hand positions allow the partner to share attention with the child without forcing or directing his movements (Miles & Riggio, 1999; Janssen & Rødbroe, 2007). Once the communication partner and a child are focused on the same element, the partner can help the child explore and expand the shared focus of attention and expand shared concepts. Hand-over-hand means that the hand of one partner is related by a light touch to the relating hand of the other partner. The mother's hand may be when lightly placed on top of the child's hand feel if the child lets her demonstrate to the child the performance of an action or a sign. The mother may also place her hand under the child's hand to let the child follow the direction of her attention to something she wants to show or share, and in this manner guide exploration of objects and participation in activities.

Hand-over-hand and hand-under-hand is also used to describe the hand positions of the child and the partners in their conversational interaction. Shifts between conversational hand positions signal turn-taking and shifts between listening and talking (Godø, 2018). Reciprocity in conversation (Linell, 2009) means that the child can relate what she expresses to what has been expressed by herself or the other person before and expect the other person to answer and comment her own utterance. There can also be reciprocity in social interaction through imitation (Hart, 2006).

Objects of reference are objects that refer to other objects, activities, places or people. A cup can represent at the activity of having a drink. According to Deasy & Lyddy (2009) objects of reference may be a bridge to communicative interaction and support understanding of the environment. Tangible objects of reference can be combined with sign language (Blaha, 1999).

Several recent studies have demonstrated that sign language can enhance communication with persons with CDB but it requires adaptations to the bodily tactile modality and to the conceptual world of the individual child. Iconic and deictic aspects of signed communication are foregrounded. Iconicity for the child with CDB can express bodily-tactile and not visual concepts, and the child may be creative in the symbolic use of bodily-tactile interaction space (Souriau, 2015; Godø, 2018; Forsgren et al., 2018; Foote, 2018; Costain et al., 2019).

Supporting communication development in a natural caretaking environment

Families do not have practical knowledge about bodily-tactile communication. Godø (2018) showed that it is a resource for a communication partner to be a natural signer, but it is not enough since sign language is a visual language. Know-how must be

given in a way that captures the existing resources not only in the child but also in the partners. video- analysis and the use of focus groups or reflective teams are useful to discover, make aware of and build on the existing and emerging communicative relations and resources in the child and in the family (Daelman et al., 1996; 1999; Nafstad & Rødbroe, 2015).

The use of a role model to improve communication

The use of a role model in education will only work if the learner identifies with the model. Role model learning has been found to be effective in preventive health projects and business (Erwin, et al., 1992; Crawford & Smith, 2005). When professionals guide parents, identification by the 'learner-parent' with the professional can be difficult, due to a lack of symmetry in roles, knowledge and competence. However, in Africa, many projects about health and equality focus on women supporting other women, and UNICEF has a mother helping Mothers around the World program. Symmetry in the roles of women and mothers may therefore enable identification by the learner with the role model and counterbalance asymmetry in knowledge and competence.

Method

Research Design

Case study design

This was a qualitative single case study design that enabled close analysis of the interaction between a small number of participants (Cohen et al., 2018). The design allowed the researcher to have a richer understanding of the interaction that is taking place between a child and her most important communication partners in daily life and gives an opportunity for empowering the interaction in its naturalistic setting. The use of sharable bodily-tactile aspects in communication between mother-child and brother-child in interactive routine situations were videotaped and analyzed before and after an intervention that aimed to empower the existing communication. The intervention involved the researcher as a role model for the mother and brother demonstrating sharable aspects of bodily tactile communication with the child. The transcribed result of interaction- analyses was used as material to answer the research questions.

Exemplary case study

This case study can be considered as an exemplary case study (Markova, 2016). An exemplary case study is a case study that can be used to discuss with a theory, or a theoretical concept as basis. In the case study it is clarified how characteristics of the case

can be related to the theoretical framework. In this case it was investigated how a child with CDB can add to the knowledge about communicative development and how the characteristics of the child relate to particular theoretical concepts (Markova, 2016). Several children with CDB have residual vision or hearing function or both. It is interesting for example to explore if a child with residual vision and residual hearing and a sighted hearing caretaker can make immediate use of the bodily tactile modality to develop sharable aspects of communication. Such data would be interesting in order to highlight manifold in human communication and also to discuss a differentiation between basic and early communication intervention and teaching of communication skills.

Use of reflective team

There is agreement in the contemporary literature on CDB and communication about the need to focus on bodily tactile aspects of communication and language, there is little literature on how to adapt this knowledge in a manner that fits the needs and resources in the local context of the child. There is however agreement about the use of focus groups or reflective teams that can study video- recordings in order to detect and lift the resources that are demonstrated in the recordings and discuss how these resources can be used further (Nafstad & Rødbroe, 2015). Whether a focus group or a reflective team is used, the point is that the team will need to develop a shared way of looking at communication development which is more generous to variation and manifold than reference to typical communication development is. Within that shared generous way of looking a reflective team may be able to detect more than one observer can on his own, and the group can build shared knowledge about a particular child and relate it to shared knowledge about principles of intervention and theories of communication development that apply broadly (Nafstad & Rødbroe, 2015; Flick, 2014). In this study a reflective team observed and analyzed the video clips before and after intervention, in which the themes of the research questions were leading in the analyses and the coding of the transcripts. The transcribed results of interaction- analyses were used as material to answer the research questions.

Transcripts

The researcher used an exploratory approach (Guest et al., 2012) for sorting and analyzing the data and which was adopted from Raanes (2006) doctoral study where she describes a process for notation contributing to a Tactile Language and transcription of data in three different steps. In this case the study used Step 1 which was focused on getting an overview over the content and included a manual notation where the researcher went through the material and marked sequences of special interest in

relation to the research questions. Each member from the reflective team wrote what they observed and the researcher got the materials from the reflective team members. In each transcription a time indication was given every time when a sequence of special interest was observed. For every video-clip the reflective team tried to come to consensus about the most characteristic communication aspects.

Table 1.

Extracts of transcripts Playing

Before intervention
00:17-00:29 M4 - Brother lifts the child's hands and claps on his cheeks with the child
00:30-00:35 M2 - Brother holds the child's hands strongly but the child withdraws her hands several times
00:55-01:09 M3- Child walks back to the brother to play the game again
01:24-01:39 M2 - Brother lifts both his hands and the child and clap together on his cheeks then brother yawns
01:40-01:57 M1 - Child slaps her brother while brother lifts his head
After intervention
00:37-00:48 M4 - Child climbs on brother's back, smiles and vocalizes
00:49-01:02M1 - Brother nods his head and the child continues smiling
01:03-01:M2 - Brother imitates the child smiling
01:08 -01:M3 - Brother taps the child, shows her the doll while in body contact and shakes it, child continues smiling
01:27-01:46 M4 - Child vocalizes, brother shakes the doll, and brother shows facial expression and continues smiling to the child

Participants

The participants in this research included a young girl with CDB, her mother and her brother. The other participants were the researcher and four members of the reflective team.

The *child* in this study was a three-year-old girl with CDB, born with congenital deafness, and her vision was severely impaired due to bilateral cataracts. She uses residual functional vision to orient herself in the well-known environment inside the house and outside. The child sometimes used directional eye gaze to communicate her needs. For example, if she wanted to get a cup from the table, she was able to locate the cup with residual vision and direct others' attention to it by using pointing gestures. If she was closer to the partner, she could locate the cup with vision and turn her head toward it. The shifts in the direction of her eye- gaze were slow. The child was sometimes able to

take turns and reciprocate in communication but only if the partner was very near her and signing slowly. She only reacted to the sounds of the voice within a distance of 30 cm. The girl could perceive facial expressions if the partner was near for example; she wrinkles her forehead to express anger.

The *Mother* was a primary school teacher in her 40s. She did not know ZSL but used objects of reference, for example 'spoon' to communicate eating time and 'cup' for a drink and she used vocal expressions to communicate with her child as well as adaptive signs. Adaptive signs are defined here as those agreed upon by family members or individuals who work with the deafblind person.

The *brother* who participated in the study was a 17-year-old boy with combined visual and hearing impairment, born deaf with partial vision and doing Grade seven at a special school for the deaf where the researcher was his teacher. He was a competent sign language communicator who was fond of being with his sister.

The position of *role model* was taken by the researcher in the intervention, demonstrating bodily tactile communication with the child which included the use of sign language adapted to the child, brother and the mother. The role model acted on the background of the need to help the girl and her family members develop a sharable bodily tactile supportive strategy for interaction and communication. Besides empowering communication development, a bodily tactile supportive approach could also help the child communicate well in the future if she would lose sight completely.

In this study *the reflective team* comprised four persons, i.e., three teachers from Baulen Special Needs Project and a lecturer from Zambia Institute of Special Education (ZAMISE). The role of the reflective team members was to provide a rich analysis of the video-taped interaction during and after intervention based on their practical experience of deafblindness and bodily-tactile communication.

In accordance with the principle of *informed consent*, the participants were informed about the focus and purpose of the research when they were requested to participate and to sign consent forms. The mother signed on behalf of her children who had no capacity to give consent and she gave written permission to use the video recording of herself and her children in the research.

Research setting

The research setting was the home environment of the child. The research took place in daily situations such as bathing, feeding, self-dressing, and playing. For more information, we refer to the master thesis (Shakele, 2019).

Self-dressing

Self-dressing by the child is an assisted process because the child has to be helped

to identify what to wear and how to start dressing up, for example distinguishing between a dress and a pair of trousers is still a challenge. The mother and brother were assisting and communicating with the child in this situation.

Playing

The child played with her elder brother in the living room by clapping and throwing dolls around. The child was also fond of climbing on the back of the brother when the two are seated on the lounge suit sofas.

Intervention

After observing the above situations, the role model/researcher selected two recordings to help determine the child's expressions of focus, interest, and aspects of communication that require more or less intervention. Based on these observations, the role model introduced new knowledge of bodily tactile signs to the child, mother and brother. The main focus for intervention was to build on the already existing sign language, bodily tactile gestures used by the partners and to teach the child how to communicate in the different daily situations of self-dressing and playing. The researcher demonstrated bodily tactile signs, to the child, mother and brother how to effectively communicate with the child with CDB. The intervention was performed according the following steps:

a) Modeling interaction with the child while mother and brother were observing live.

In the different activities, the role model used both visual Zambian Sign Language and tactile signs to communicate with the child. During the acting together and face-to-face-interactions she demonstrated attuning and directing attention, bodily tactile signs, by hand-over-hand contact and body-to-body contact. The role model reciprocated signs of the child, initiated playful actions, used objects of reference and signed close to the child's face.

b) Video feedback with the mother and the brother regarding the video - taped interaction of the role model with the child.

The sessions with the role model were recorded on video and were provided during intervention in order to effectively equip the participants with communication and signs using the bodily-tactile modality.

The role model explained to the mother and brother about her interactions with the child during the activity. She explained the use of objects of reference and the importance of repeating signs. She showed them face- to- face interactions, explained what turn-taking markers are in the activity e.g. by giving a child a turn to take the lead in clapping. The role model also discussed how she used face-to-face and body-to- body-

interactions and pointing gestures.

c) Instruction to the mother and the brother to repeat certain communication aspects

She instructed mother and brother to use ZSL gestures and hand-over-hand signs during interactions and how to do that. She asked them to imitate that reciprocal attitude.

d) Mother -child interaction observed by the role model

The role model observed the mother using ZSL to the child, using bodily tactile signs, hand-over-hand interactions, tapping gestures, turn-taking and turn-giving and deictic gestures.

e) Brother - child interaction observed by the role model

The role model observed the brother using sign language to the child, and reciprocating games. He also used a tapping gesture to draw the child's attention.

f) Discussion with mother and brother about the observed interactions

The role model discussed with the mother and brother the use of hand positions and body-to-body communication, the use of repetitions when signing to the child, attention shifts, sharing of emotions, and the use of deictic gestures in the activities.

Data collection

Video recordings and selection

The researcher made 4 video recordings of the child interacting with mother and/or brother, before intervention and 4 video recordings after intervention from the activities bathing, feeding, self-dressing and playing. The researcher made another two video recordings of the child interacting with researcher as a role model in bathing and playing activities during intervention. Also two extra video recordings of mother-child interaction and brother-child interaction were made during intervention. The total video-recorded material of the interaction with the child is 3 hours, 8 minutes and 38 seconds.

One sequence of about 3 minutes for each situation was selected from the baseline videos and from the post intervention videos in collaboration with the reflective team.

Data analyses

The analyses were guided by the Diamond model (Nafstad & Rødbrøe, 2015) which described the social interaction and reciprocity in the interactions and the Dialogical Space model which helps to analyze attention directing and attention following gestures and postures that occur within the tactile conversational frames (Nafstad, 2018). Besides those two tools described in the theoretical framework, the analyses were guided very concretely by the research questions. The researcher used the following categories in analyzing each transcript: a) communication aspects, b) partner's communication, c) child's communication, d) interactional elements according to the Diamond model, e)

dialogical elements according the Dialogical Space model, and f) agreement by the reflective team. In the last category the main aspects of special interest on which the team agreed in consensus were described. After analyzing all the transcripts, the researcher made comparisons between the baseline results and the intervention results across the four situations.

Results

For the observed interaction situations, aspects of interest are described before and after intervention regarding the themes: a) communication aspects, b) partner's communication, c) child's communication, d) interactional elements, e) dialogical elements, and f) agreement reflective team. Here the results of Bathing and Playing are described. For more information we refer to the master thesis (Shakele, 2019)

Bathing

Bathing before Intervention

Before intervention during bathing the communication aspects from the Mother were mainly acting together with the child, mother acted the most by leading in the dressing and bathing acts. Mother did primarily the washing: e.g. she poured water on the child's body and rubbed soap in the face cloth while brother was present too but was not in a sustained physical contact with the child and the mother. The child followed the actions of the mother and was joining in sometimes e.g. mother pulled the skirt and the child removed both legs from her skirt. There was face to face interaction between mother and the child where mother was facing the child throughout the activity and rubbed the child's legs and hands. The child had attention for both mother and brother during the activity. The child directed her attention by looking at the brother when he walked towards the fridge. Mother also had attention during the acting by looking and vocalizing to the child. The reflective team agreed that there was face to face interaction and attachment. Partner was aware of the child's acts and the child had comfort in the mother.

Bathing after Intervention

In the bathing activity, after intervention, communication aspects developed such as tactile conversational positions e.g. hand over hand; tapping, pointing, gestures and sign language were used by the brother. Zambian sign language was the most frequent type of communicative act utilized, with use of abstract objects of reference also evident in the data. The brother used his index finger to point and refer to the child to get in the baby dish with water inside. In another example he used his index finger to point an

orange on the table. In ZSL it is common to use an index finger to refer to things; this way of referring to things was present in the data especially when the child was interacting with the brother in ZSL. When the brother signed 'bath' in ZSL, the child also imitated and signed 'bath' with one hand.

Hand over hand position was also the most observed category in the data. The frequency of the hand-over-hand positions indicated the development of the child's ability to participate in a tactile conversation practice. Throughout the transcriptions there were several examples of how the brother used different hand positions together with the child: e.g. they held the dish together and poured water in the dish; they rubbed soap on the face cloth together. Brother's hands were on top of the child because brother was in speaking position and the child was in listening position. They used the hand-over-hand positions to converse tactilely. However, there was also face to face interaction between the brother and the child as he was facing the child and in physical contact and they did the activity throughout by facing each other with hands in contact. Turn taking markers were observed as important ingredients in their interaction. The partner used the hand positions by rubbing soap on the face cloth to mark taking position then stopped as a marker that the turn has ended. The brother gave the child soap and a face cloth as a marker for turn giving in the conversation.

Child had attention for the brother almost whole session. For one instance she was directed to herself "the child washed and played with a towel while rocking herself". The brother directed his attention to the child by pouring water on the child's body and signing BATH repeatedly in a close proximity.

The reflective team agreed that there was face to face interaction and bodily tactile interaction, much tactile signing by the brother, and a sign by the child.

Playing

Playing before intervention

Before intervention, communication aspects such as holding were observed in the activity. The brother was holding the hands of the child to keep her in contact while sitting down together with the child. There was an example of a bodily touch where the brother grabbed the hands of the child by force in an attempt to keep the child in the activity because the child was withdrawing many times. The brother also used hand positions by holding the child's hands e.g. his hands on top of the child because he was in a speaking position and the child's hand under his hands as she was in a listening position. Another example of a hand position is where the brother was clapping together with the child on his cheeks while holding the child's hands strongly to avoid the child from withdrawing. The child withdrew but the brother pulled the child's hands to start the game again.

Child's communication: The child joined in the game but withdrew several times.

The child looked from a distance to her brother. Facial expression was observed from the child. She smiled as she walked back to the brother to start the game. They started the game with the brother and eventually withdrew. The child slapped her brother while he lifted his head. The child used a pointing gesture by pointing to the head of the brother. Face to face interaction as brother and child sat facing each other while clapping. The category of reciprocation was not seen very often in the activity. The child directed attention by slapping her brother.

The reflective team agreed that the smile is a sign that the clapping is directed to the brother, as an indication that the girl experienced the brother's engagement in clapping as a reciprocation of her clapping.

Playing after intervention

In the video material communication aspects were observed such as vocal expressions, laughing, ZSL signs, imitation, pulling hand, and gesturing, initiating acts within the game such as throwing doll, nodding the head. Some aspects are illustrated by pictures (Figure 1).

Partner's communication: There was an example in the video where the brother used ZSL to sign PLAY. The child responded with several vocal expressions to show enjoyment. The child initiated acts within e.g. climbing on the brother's back and the brother initiated the opportunity for the child to sit on his back. The brother imitated the child as she was throwing the doll up. The category of turn taking and turn giving in the game was used e.g. the brother threw the doll up as a marker for turn taking and stopped throwing the doll as a marker for turn giving. The child took the turn by throwing the doll up while vocalizing as a sign of enjoyment in the game. Use of gestures by the brother, was present in the activity. He tapped the child on her shoulder and shakes the doll while nodding his head as gesture as well as calling the girl by using open and closed fingers (beaconing). Another example of face to face interaction and body to body interaction was when the brother leaned on the child in physical contact. Reciprocation was present in the activity when the brother shakes the doll, the child reciprocated later by shaking the doll. Attention was directed to each other. The brother directed attention by picking the doll for the child when it fell off.

The consensus reflective team agreed that the child enjoyed the game because there was turn taking and turn giving during the activity. The vocal expressions by the girl implied enjoyment during the game.

Figure 1

Pictures to illustrate some important interaction patterns

Picture: Example of hand over hand positioning



Picture: Example of reciprocation



Picture: Example of imitation



Discussion

Conclusion

It can be concluded that the intervention had indeed a positive effect on a variety of bodily tactile communication aspects between the child and her family communication partners. The most important aspects which improved were the use of hand over hand positioning, the use of tactile gestures, tangible object of reference, and ZSL signs, reciprocation, body to body interaction, mutual attention and affect attunement.

The findings in this study clarify how use of sign language and hand positions can benefit persons with CDB to improve their communication. The study has shown how competent mother and brother were communicating with the child after intervention using ZSL, reciprocation and imitation and hand positions. The utterances that were addressed by the child to the partners in gestural expressions were answered by the

partners. Lastly, it has shown the need to focus on whole-body communication, understanding, and relating to communicative expressions.

Communication aspects before intervention

Before intervention in all activities the mother and the brother led mostly the actions and the child followed most of the time and joined in. The mother used also vocalizations. The brother used some Zambian Sign Language signs, tapping gestures to get the attention of the girl and some pointing gestures. He showed reciprocation once, and hand over hand positioning during play. It was observed that he grabbed the hands of the girl by force. The child was looking to the partners sometimes but the attention was more addressed to the activity and the actions than to the partners. During dressing she used a gesture when she was failing in dressing. During play she showed facial expressions, a smile and a pointing gesture. There was face to face interaction in three situations and no real interaction during feeding. The attention of the child but also of the partners was before the intervention more directed to the actions than to the other.

Effectiveness of the Role Model intervention on bodily tactile aspects of partner's communication

The intervention existed of a role model approach in five steps in which the role model demonstrated aspects of tactile bodily communication and in which she gave video feedback, among other steps. After intervention both partners used ZSL, objects of reference, imitation, gestures, hand over hand positions to communicate with the child throughout the activities. The partners were aware of the child's signals and interpreting them with insight and thoughtfulness by responding in an accurate manner. Regarding interactional elements there was not only face to face interaction, but also more body to body interaction. Other interactional elements were identified such as mutual reciprocity. The partners used more good sequences of turn-taking, hand over hand contact and imitation. Tapping gestures and pointing gestures were used throughout activities. There was more mutual attention between the partners and the child. The brother knew certain aspects of bodily tactile communication before intervention but he did not use them throughout the activities and the mother learned to apply all the different aspects because of the intervention by the role model.

Effectiveness of the Role Model intervention upon the child's communication

The intervention had a positive effect on the child's communication with the partners. She showed many more communication aspects in the bodily tactile modality after intervention such as imitation, pointing gestures, hand over hand positions, ZSL

signs, objects of reference. She initiated acts in body contact during play. She showed enjoyment by vocalizing. She joined in more smoothly in turn-taking during dressing. She used tapping gestures and reacted on pointing. The girl had attention for both partners throughout the activities and was more addressed to the partners than to the actions. The girl trusted both partners.

Results related to theoretical background and critical reflection

The Diamond Model (Nafstad & Rødbroe, 2015) helped establish that the three most basic environmental relations in face-to face interaction; attachment, social-interactive play and exploration were already in place in mother-child and brother-child before intervention. Intervention could focus on the more complex relation “Conversational interaction”. This relation requires interaction patterns that enable mutual attention and reciprocation of roles and perspectives in relation to actions, signs and utterances. This child had a signing brother and therefore had natural access to sign language. This study added to the empirical evidence that an intervention which is focused on reciprocation and imitation of roles and actions in the bodily tactile modality can improve the child’s access to conventional signs and cultural ways of acting in daily life. The Dialogical Space Model (Nafstad, 2018), guides communication intervention more in detail to focus on reciprocal shifts in other- directed attention. The results of this study showed this is a relevant intervention focus, which is in line with other studies in the deafblind field that focused on interactional prerequisites for intersubjectivity (Damen et al., 2015; Wolthuis et al., 2019). Before intervention the child did not show reciprocal shifts in other- directed attention during interaction. She looked at others’ activity, expressing curiosity, and joined into the activity sometimes, but she did not engage in sustained reciprocal interactions. Also mother was not able to share attention in the bodily- tactile modality, and the brother also not. After intervention, they were all three immediately able. The Dialogical Space model, specifies that the change shown in the results had to do with the intervention that focused on shifts and reciprocation in other-directed attention. The model is clearly focused on a specific intervention goal. In this way the study adds evidence to the relevance of intervention goals demonstrated in other studies of CDB and communicative sharing or intersubjectivity (Damen et al., 2015).

In this case study several existing resources could be identified before intervention in child, mother and brother. There was already a context of stable attachment relations, bodily interactional routines and rituals of daily life, and assigning brother. What was lacking was connectedness between the existing resources, in the form of adapted interaction patterns. These interaction patterns that enable communicative sharing, were the focus of both conceptual models which were applied in this study.

The child in the study had residual vision, and the study exemplifies the need to

think about bodily- tactile support in communication development even for a child who has residual vision.

The study showed that residual vision has been sufficient to help the girl be aware of the world beyond her reach. She looks at others' activities, at places, sometimes at persons/faces. This awareness of course is a very strong motivating force. However, the child showed that she profits immediately from the bodily-tactile support. Therefore the study confirms the relevance of relating to theory about bodily gestures, hand-over-hand positioning and body-to-body interaction. In literature it was stated that for children with CDB it is important that partners not only use face to face interaction but also body to body interaction. Body to body interaction can combine the child's need for togetherness and secure base which are essential for growing to independence and self (Gregersen, 2018). The hand over hand positioning is important for giving the child the opportunity to explore without being forced or directed too much (Miles & Riggio, 1999). In this case we saw fluent hand over hand contact throughout the different activities after intervention, while before intervention it was observed at several moments that the bodily tactile interaction was forced or more directive.

The results of this study showed that to work with persons with CDB, there is need for communication partners to be fluent signers. It is important for all communication partners of persons with CDB to receive guidance in signing, so the person with CDB has access to language (Larsen, 2016). But this study showed at the same time that only sign language is not enough. There must be a connectedness between signing and adapted interaction patterns.

The role model approach that was used in this study enabled mother and brother and child to learn through reciprocation of roles and imitation. It is a natural form of learning which does not necessarily require shared reference to theoretical concepts. Natural non- theoretical learning can be a good approach especially when intervention is targeted to families in early intervention. Immediate results that find the right communication modalities and forms for the child are very important in early communication intervention (Chen et al., 2000). In this study the role model was also a mother of a child with CDB. For the mother and brother to feel competent, it was important that the relation to the role model is sufficiently symmetrical. Without sufficient identification it may not work. This role model approach is therefore different from demonstrations by a competent professional about how to do things. This might have the opposite effect. The role model approach may have particular relevance in the African context, where woman- to-woman and mother-to- mother support are used as resources also in other fields (Erwin, et al., 1992; Crawford & Smith, 2005).

Limitations of the study

Several limitations of the study can be identified. First it is not possible to generalize how the bodily tactile modality can improve communication from only this qualitative single case study. It would take more case studies to find out if the results of this role model approach are successful for more children. In this case a child with residual hearing and residual vision was participating. It has to be investigated further how the intervention can be applied with children who are totally blind and/or hard of hearing or deaf. Second, it can be questioned in how far the person of this role model with her competences and background as a professional and a mother of children with CDB was of influence. More interventions with the same approach by different role models could be applied. Third, this role model approach consisted of different guiding components such as modelling, video feedback and instruction. In order to be clear which of the components are the most beneficial, more studies have to be performed. Fourth, the observation method was performed by the researcher who was also the role model. It can be questioned in how far the results were influenced by that, although a reflective team was used to come to consensus and more credibility (Flick, 2014)

Recommendations for future research and practice

It is recommended that more case studies with this role model approach will be applied to more children with CDB, and to more children with other variations of CDB, not only children with residual hearing and vision. It is recommended that this role model approach will be applied also to more children with other disabilities such as multiple sensory disabilities. More applications of this intervention would contribute not only to the evidence of the role model approach but also to the evidence of studies in which the Diamond Model and the Dialogical Space Model are used (Godø, 2018).

It would be very interesting to investigate if this specific role model approach in which a mother guides another mother, or a parent guides another parent, can be implemented in Western countries not only in deafblind education but in early intervention in general.

It is important to transfer this role model approach to professionals and to study if the intervention would be as effective when a professional guides a parent, or would it indeed work the opposite. And what would be the effects if the role model approach is implemented by professional guiding other professionals? That needs further investigation.

The most important implication for practice is that more communication partners should be educated in the bodily tactile modality. Early intervention would work best for the development of language by people who are congenitally deafblind. There is need for competent communication partners who have knowledge in bodily tactile signing to work

with families. This study can be a contribution to the knowledge of the way a child with congenital deafblindness can use different modalities to improve communication in natural daily life experiences. Gestures, tactile and pointing gestures, may provide educational opportunities to introduce vocabulary. Connectedness between signing and adapted interaction patterns is very crucial.

It is recommended to implement this role model approach from mother to mother, or parent to parent, at a broader scale in more cases in Zambia, and if possible also in other African countries. This could be done in collaboration with other master graduates and may be new African master students of the Master program Communication and Deafblindness at the University in Groningen.

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