

If you can see it, you can support it

A BOOK ON TACTILE LANGUAGE



Nordic Welfare
Centre

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Nordic Welfare Centre

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Index

Preface

p. 04

If you can see it, you can support it

p. 06

1 Parents and family – a source to knowledge p. 09

2 Tactile language – a circle model p. 18

3 What do you mean NOW? Context and meaning p. 28

4 On language development in children with congenital deadblindness p. 34

5 Language must be sensorily accessible p. 42

6 «We hear with our brains» p. 48

7 Tactile sensations as the basis for the development of tactile language p. 54

8 Thoughts on tactile language p. 61

9 Languaging between a child with congenital deafblindness and a bimodal, bilingual teacher p. 69

10 Tactile iconicity used in sign constructions by persons with congenital deafblindness p. 82

11 Language development in the tactile modality through outdoor activities p. 90

12 Embodiment: From bodily experiences to meaning construction p. 99

13 Tactile cognition and language development: What are tactile working memory and autobiogapfical memory? p. 107

14 Partners' contribution to language development in a bodily tactile modality p. 117

15 When Trine says GRANDMA ... p. 128

16 Apple trees and horse bus p. 137

17 Multi-party communication p. 147

18 Haptic signals p. 155

19 Bilingual Santeri p. 163

Preface

The Nordic definition of deafblindness states that it is a combined visual and auditory impairment of such severity that sight and hearing have difficulty compensating for one another. Deafblindness therefore presents a specific disability in relation to the surrounding environment. Communication is one area that is almost always affected. The need to utilise tactility to receive information and participate in communication is significant.

The word communication is often defined in general terms as the ability of people to exchange information, ideas, or feelings. On a deeper, figurative level, communication also means connection, affinity and unity. Article 2 of the United Nations Convention on the Rights of Persons with Disabilities offers the following definitions:

- “Communication” includes languages, display of text, Braille, tactile communication, large print, accessible multimedia as well as written, audio, plain-language, human-reader and augmentative and alternative modes, means and formats of communication, including accessible information and communication technology;
- “Language” includes spoken and signed languages and other forms of non-spoken languages.

The UN Convention on the Rights of Persons with Disabilities has been ratified by all Nordic countries and as such must be implemented. States shall work to promote, protect and ensure the rights of all, regardless of functional ability. Disability can mean an impairment to physical, mental or intellectual ability. Disabilities

are those impairments that present an obstacle to an individual in relation to their environment. In the case of communication, the obstacle may be societal lack of knowledge and inability to communicate with a deafblind individual. The consequences may be physical and mental isolation.

If people with deafblindness are to have the opportunity to participate in the Nordic welfare society on equal terms, knowledge about communication and language development must improve. While the Nordic countries share many common challenges and have similar needs for greater and better knowledge, there are also examples of organisations in which new knowledge has been developed and implemented.

It is our hope that this book will contribute to the provision of improved conditions for the exchange of experiences, preservation of competencies and development of knowledge and methods that promote the linguistic development of persons with deafblindness. This book is intended to contribute to more girls and boys, women and men with deafblindness having the opportunity to develop their communication and language abilities so that they have the resources for inclusion and participation in our Nordic societies.



Eva Franzén
Director
Nordic Welfare Centre



If you can see it, you can support it

When we put on our language glasses and give bodily tactile utterances a linguistic value, we can communicate with persons with congenital deafblindness at a linguistic level.

KARI SCHØLL BREDE, MARIA CREUTZ AND HELLE BUELUND SELLING

In the Nordic network on tactile language, our starting point is the understanding that all people want to tell about and share their feelings, thoughts and experiences with others. The basic assumption is that language emerges in complex interactions between two or more communication partners, and that all people have an innate ability to engage in communicative relations with others. A challenge many people with congenital deafblindness face is the risk of being misunderstood and no recognition of their communicative agency as their communicative expressions for an untrained eye can be difficult to read. In the field of deafblindness we speak about the low readability of expressions. It is well known that low readability creates a risk of isolation, but if more communication partners get the opportunity to recognise bodily tactile

expressions as language, and thereby make language sensorily accessible for both parties, we contribute to increase readability and thus minimise the risk of experiencing isolation. Through meaningful conversations, the world becomes available to the individual.

This material is directed at professionals, parents and family members of people with deafblindness. It consists of information, tools and practical ideas/tips on how to support and give the best opportunities for language development in a tactile modality, so that the person with congenital deafblindness is recognised as a human being using language.

The motto of the book is: *If you can see it, you can support it*, and the book offers suggestions on how close relatives of

people with congenital deafblindness and people with dual sensory impairments can spot and read utterances in the bodily tactile modality as language. It suggests how to respond to these tactile, linguistic utterances and how to support further development by using different cognitive strategies in the dialogue, which activate both tactile working memory and tactile autobiographical memory.

Our aim is not to propose a definition of tactile language, as we do not believe it is possible to provide an exhaustive definition. Nor do we think that such a definition is an aim in itself. Knowledge about language development is continually changing and developing, we learn more and get new insights and perspectives. In this book, we place tactile language in a dialogical framework, where the assumption is that humans are languaging right from the start and that language development occurs in a complex interaction between the individual, the people we engage with and the surrounding environment. It is important to understand language and language development in a wide perspective, as mutual interactions between bodily, sensory, cognitive and pragmatic action processes.

In 1945 Merleau-Ponty wrote about the body and the bodily engagement in the world as a basis for human understanding and realisation. He emphasised that body and mind were not separated in two different entities, but represent one system. Also, Peter Kemp wrote in 1972 that we sense the world before we are able to understand it. The two philosophers present an understanding on

meaning and language acquisition that support the assumption about man as a linguistic being, an assumption that applies to all people – including people with congenital deafblindness. The core point here is that when we accept the premise that the bodily engagement in the world is the basis for understanding and realisation, it also makes sense to look for language that emerge from the body's experiences about being in the world. Through this language we thus gain access to stories about the individual's life and it give us opportunities to talk about the stories and what concerns us.

The book consists of 19 separate chapters, each addressing one or more aspects of tactile language and altogether they illustrate the complexity as well as the wider perspective in the understanding of language development through the tactile modality. You can choose whether to read the book from cover to cover or whether to read the chapters in the order of your choice. In the chapters, cross references are found to the other chapters of the book, as well as a list of references if you wish to go deeper into an individual subject area. The book represents where we are today. There is a need for more research and more case studies of language development through the bodily tactile modality, and we hope that the book will inspire a continued Nordic cooperation and progress in our understanding.

The editors wish the reader an enjoyable reading experience and hope that many constructive discussions will emerge as a result.

Parents and family

– a source to knowledge

GRETE A. STEIGEN

**KEYWORDS: SIGN LANGUAGE, BODILY TACTILE COMMUNICATION,
CONGENITAL DEAFBLINDNESS, CHARGE SYNDROME**

This is the story about us. About how we got to be professionals around our own child. About how we learnt what to look for and put words to Tormod's bodily tactile language. About how I never took the time to learn proper sign language. About how carpentry and Bua-Mi (My-Cabin) got to be a part of language development and understanding. About how Dingle, Ireland, got to be the first and foremost language arena for Tormod.

It was exactly as the professional who came from State Central Team for deaf-blind said, "It will be a good investment to learn proper sign language for you". And I knew he was right. In a hectic everyday life, none of us got around to do that. Not that as well. It is what I regret most that I never got around to do.

The history of my family is full of everyday, regular days. A lot of decisions, some big and life changing, some minor and regular. All on behalf of Tormod. Today, a young man with congenital deafblindness. Congenital deafblindness as a part of a CHARGE syndrome diagnosis. And we made some bold decisions.

Tormod entered our family in August 1986. Just about 14 months younger than

Jonas. Olai, the younger brother was born in 1989. And we were young parents, Jan Ole and I. Just 25 and 22. We were new as farmers as well. We had professional ambitions. We wanted to expand our farm and we wanted to make a living from dairy farming, way up in the mountains, in Sømådalen, next to Sweden.

This is the story about the choices we made and the choices we should have made. About the tough choices; how to make the right choices for a family member – without being able to look into the future. Every family is unique. Every family has strengths and weaknesses. Every family have to make their own choices. The choices are not always right. But they are always based on the knowledge at the time that the choices were made.

Our story

Jan Ole reminded me, we were quite controversial in the mid-80s. Because we used every opportunity to tell Tormod's story. And we brought Tormod with us. Everywhere. He was a visible child. And he caught every eye being so different. With his minor and major lack of functions. And he had a diagnosis no one had ever heard of. CHARGE in Tormod's world was oesophagus atresia, no passage for air through the nostrils, pupils shaped as key holes and severe hearing loss. In addition, Tormod was tiny and did not put on weight. And he was vomiting. Constantly. But the will to live got top score. Actually, it is a defined trait with CHARGE Syndrome – the extreme will to live.

Family

My in-laws came to visit at the hospital in Oslo early November. Tormod was six weeks. A touching picture of Granddad meeting his skinny grandchild Tormod for the very first time. Tormod with plastic tubes sticking out from his nose. We, the parents, thought Tormod had made huge progress the first six week. The grandparents saw a tiny, fragile grandchild. Tormod had two cousins, all three of them born in August 1986 and in comparison, Tormod was underweight. A very sick, underweight baby. He stayed in hospital for eight months.

The extended family was to be our help and close network. All generations. We have recruited lots of good helpers over the years. From Great Grandmother to Grandmother to lots of cousins, they have all been on Tormods payroll. Tormod and uncle Reidar Martin are long time pals. 15 years and counting. Reidar Martin started out as Tormod's teacher and followed

Tormod home to his grown-up life. In Tormod's grown up life in his own residence. Reidar Martin manages Tormod's house and staff. Often, we find them out in the wilderness, skiing, kayaking or just rambling the five km down to Tormod's Bua Mi¹.

The society around us

I remember I waited for "someone". "Someone" who could guide us in the jungle of sick pay and future. Eventually we got a more or less secure grip. And quite soon we got in touch with Frambu, a centre for rare diagnosis. In our extended family network I had a cousin who worked at Skådalen school in Oslo. So, via Frambu and my cousin we got in touch with support service for congenitally deafblind. So it was called then: congenitally deafblind. The semantics have changed. Now it is called children with congenital deafblindness.

The state central team for congenitally deafblind and Frambu were door openers into the support systems for us. We had an early assessment at the specialist department at Skådalen School. Pen was hardly put to paper on The model on interaction², the well-known work of Anne Nafstad and Inger Rødbroe. We were lucky. We came into the field of deafblindness just at dawn of a new era. This shift made us think "sky is the limit". Tormod was only four or five years of age when we decided that our small rural town should be his future. Where to grow up, where to go to kindergarten and school. And somewhere in the future, his permanent resident home. His home place throughout his life. This was a bold choice. And a controversial choice. And it was not supported by professionals.

¹ A building project, described later in this chapter.

² Nafstad and Rødbroe, 2013



Tormod likes and seeks sensory experiences.

Meetings in unknown territory

This was unknown territory for real. And we got to be a part of the movie Møter I ukjent landskap (Meetings in unknown territory), created by Knut Klæboe. The movie told the story of people with congenital deafblindness. All ages, Tormod was the youngest. He was out walking in mountain scenery with Great grandmother. A Great grandmother with the same extraordinary spark of life as Tormod. She had great expectations for her great grandchild. And first and foremost, the generations before us had shown what was possible to achieve. It is just down to hard work.

Being a part of this movie, made us believe we were well able to create a great life for Tormod here, amongst us.

A life worth living, based on local values. Based on a close community. An everyday life linked to the farm work and the nature surrounding us. And the territory was no longer unknown.

Practical choices

We had to make some practical choices, Jan Ole and I. There were simply not enough hours for either of us to keep track of both Tormod on one hand and developing the farm on the other. We decided I should be in charge in Tormod's life, and Jan Ole should be in charge of everything concerning our source of income, the farm. A professional said in retrospect: "This was the choice that saved you"! That we were well able to see we had some extraordinary huge tasks on our hands. Neither of us were able

to keep up with all areas at all times. At the same time we made room for both of us to do what we loved the most. Jan Ole spent time running and cross-country skiing. I went back to university. This was what kept us going. Some hours dedicated to each of us.

Network

In the early nineties other families entered our lives. Like us, they had children with congenital deafblindness. And we understood, due to our choice for Tormod to live in our rural town, it was our responsibility to create a network around him. One of the families came by boat, down the lake, Langsjøen. They had their summer cabin just up the lake. The next family made contact after a story on Tormod in the papers. From these early visits, the network expanded over the years. Johnsgård is more than just a farm, it is also a tourist centre. The family has, alongside farming, built up a campsite. And Johnsgård has over the years become a meeting point for extended families with a family member who has congenital deafblindness. Without this network life would have been impossible. This network has provided new energy.

Early support

We were supported by a service that saw the importance of good networks. And our family network intertwined with the professional Skådalen school for the congenitally deafblind. It was possible for us to be part time at the school and we got the support and inspiration we needed to maintain everyday life at home. The overall task was to communicate with Tormod. And to learn to interpret his own voice. A language with low readability and a bodily tactile language. It was just for us to learn how to interpret his language first.

Communication

Communication with people with congenital deafblindness is always challenging. As most parents, we had a dream that the rest of his vision and hearing would be enough, but it was not. And eventually Tormod lost his remaining vision, first on one eye and later, on the other.

However, he became a specialist in spatial communication. He took us to the places where he had been experiencing something worth telling. It took time for us to understand he had something to tell us. This field of knowledge and we have been learning in sync. We came into this field in times of change. Experiences from in Norway, Scandinavia and Europe came to Sømådalen through close cooperation with groups of highly competent professional giving us easy access to competence and the latest knowledge. And we contributed to the development this knowledge as well. The knowledge is so specialised, we were lucky to be a part of it. Without this access to knowledge it would not have been possible to develop a high-quality life in rural Norway. And these highly qualified people wanted to cooperate with us. I think we made contributions as well.

Personal development

In the early eighties parents and professionals were seated at different tables. We, the parents, could come and share our experiences with the people of knowledge, for example at Nordisk Uddannelsescenter (NUD) (Nordic Education Centre) for professionals, but we were not let into the discussions with them. But this changed with the meetings in the communication groups formed around each child with congenital deafblindness. In these groups we could speak freely and share our experiences on the same terms

In these groups we could speak freely and share our experiences on the same terms as the professionals. It is the parents who hold the special expertise on their own child, and it is the parents and siblings who spend most hours with the child with congenital deafblindness.

as the professionals. It is the parents who hold the special expertise on their own child, and it is the parents and siblings who spend most hours with the child with congenital deafblindness. And we need the knowledge daily.

Central in this story are the choices I had to make for myself to fill the position of the person who was to make all the decisions. As a 30 year old I started a long line of education. And I am still a student, not far from turning 60. Psychology and developmental psychology were handy, and the studies were timed perfectly. And, as I pointed out earlier, I should have continued into sign language. In hindsight, studying sign language would have given me a tool kit for communication with Tormod. I could have used this tool kit and answered Tormod with conventional signs to lift his language development to a different level. I think. I do not know. But I think it is like this. In all the here and now-situations. Like the time when Tormod flung the fridge door open. He was hungry, not hard to interpret at all. But, instead of a quick interpretation, I could have stopped and expanded on my sign communication with him. A great opportunity to expand on the number of words and to expand on the number of

conversations to get the repetitions so needed for persons with congenital deafblindness. Jude Nicholas writes about what we currently know about this and why it is important, in chapter 13. Instead signs were in use every now and then, if I remembered. And the numerous every day events like these I reacted more on instinct than to see every situation as a possibility for conversation. Because I understood Tormod, too well! Even before he got a chance to express himself at all. As mothers do, we read minds.

We have been taught sign language on several occasions. But when our partner did not respond back, it was hard to remember the signs. If I am to do this over, I will learn sign language – fluently.

My-cabin

As I have pointed out, we have made some bold choices. At one point we meant the natural thing for Tormod was to build a cabin. As a part of a language project. Luckily there are some bold consultants as well. Guided by senior supervisor Kari Schjøll Brede at Eikholt, the manager at Tormod's house Reidar Martin Steigen and Skådalen School for the congenitally deafblind, we started a project named Bua-Mi³.

³ Brede, 2013 and 2014

Tormod and a pupil at Skådalen were the apprentice carpenters. The idea was to monitor closely what development we could find by working with meaningful activities. The start point was well known, a little house, we then expanded out from the well-known negotiating every sign. We negotiated every sign for both the participants. It took a while and time was an important factor. This influenced us all, by going back and repeating. How did we build these walls? "First a wooden frame-work, then the timber roof trusses, then all the screws." It was not just physical scaffolding for a cabin, but also a mental scaffolding. This scaffolding enlightened the process for us all.

To build a cabin is real world – authentic. There is a long line of issues that need to be solved. We had a solid professional carpenter working with us. A tall one, close to two metres and he was skilled, to him it was not a problem to guide a deafblind alongside building a house. Some issues are expected. It is possible to plan for those. But the carpenter not coming to work due to a cow giving birth, you cannot plan for this. It is just too complicated a mind-set to follow. The apprentice was devastated. It does not get more authentic than that. And it took a while before this apprentice was able to put words to the tragic event with the tall carpenter not coming to the site. To us this was an eye-opener. We never normally plan for broken expectations.

There were good expectations to the story as well. Waiting for critical the moment when the timber is to be cut by the saw, with one part falling to the ground. These are the moments of great expectation. Both apprentices thought these moments were the most exciting. Waiting for just that moment, the moment of the fall.

This made tactile traces. For Tormod this particular trace was set on his forehead. He felt the work of the saw in the timber with his forehead. And that is where we find this particular sign for this particular event; on his forehead. When we look for signs, we often look in the wrong places. For Tormod the words are where they happened. For cutting timber with a hand saw, the sign is placed on the forehead. Because that is where it happened.

The teachers and the pupil from Skådalen shared their knowledge with Tormods staff and network. Kari and several interpreters shared their competence on sign language and communication. A lot of the events were filmed and immediately analysed. Some of the films have been analysed repeatedly by several professionals. To find new knowledge about the complex bodily tactile communication. Through these analysis we learnt a lot about what Tormod's own language looked like.

Video analysis

Video analysis has always been in use in this field and still is. We have found it an important tool to unveil Tormods language competence. To notice and really see his language has been a long process. Maybe we can say the understanding of bodily tactile language has been in sync with Tormod. The knowledge about bodily tactile expressions is just recently described. My own understanding and knowledge of it has developed in close relation to this professional field.

Amongst other things, we started to look at Tormod's language development in an environment we could control happenings and where we could control the premises. We went to Ireland in 2002. To Dingle, a small town, year after year.

Slowly but surely we understood Tormod had spatial skills and he had a spatial understanding of his surroundings. Eventually we understood these skills also was a part of his unique communication.

With Jorunn Sømåen, a family friend and a co-worker for many years. Jorunn and I have been a on these trips. About 20 in all. By going back to the same place, we saw how Tormod mapped the town, in a tactile way and visually. He licked his way through the town. For us it was about sitting on our hands and let him do what he needed to do. And to trust this was important to him.

He lost his eye-sight. First one eye, then the other. We saw him navigate as steady as ever even without vision. Slowly but surely we understood Tormod had spatial skills and he had a spatial understanding of his surroundings. Eventually we understood these skills also was a part of his unique communication. He took us to places where meaningful events had taken place. How he steadily kept at it, just to tell "We have been here before. Something worth remembering took place here".

On our trip in 2017 we understood Tormod's head was thinking about the trip in 2004. Annine, a young friend, was with us. Jorunn and I kept telling Annine about what we had done on previous

trips. Just chatting between us with normal voices. We talked about Hans Olav, Jorunn's husband. He had been with us on this trip in 2004. We talked about Jorunn buying a certain sweater for Hans Olav as a gift for Hans Olav. All this chatting about Hans Olav! Tormod walked us straight to the specific coat stand in that specific store where Jorunn always had shopped the sweaters for Hans Olav. This was Tormod's contribution to the conversation about "Hans Olav" and "sweater". And Tormod took us to Strand House. A store in Dingle selling clothes. It had been rebuilt and altered several times over the years we have been visiting. He took us to a certain department six times. Six times we did not get it. Back home in Norway we got it. Tormod and Hans Olav had been there, buying Tormod a red jacket back in 2004.

So, detailed information about the story is necessary to understand what the expressions could look like. And we always under estimate. Always! It has taken years to understand how imprints leaves traces. And how these traces eventually show as expressions.⁴

⁴ Nyling, 2003

Diagnosis

Diagnosis is important. To know that people with CHARGE have difficulty integrating their senses. But how does this show? What does it look like when the senses battle instead of supporting each other? What are the consequences? Marie Nordberg from Tormods staff and Kari from Eikholt set out to meet with David Brown in Stockholm. David Brown is a special pedagogue and has been working with pupils with CHARGE in USA for many years. He told what the impact a lack of integration of the senses does, and what it looked like and how it could be helped.

Marie was on fire when she came back. She put Tormod on her own back and went in the field to plant potatoes. Suddenly, Tormod could, due to bodily support, have enough free energy to plant potatoes. Today he uses the same method when he is bottle feeding calves. He finds the

support he needs by hanging over the back of another person. Then he can get a good grip on the bottle with both hands. And he can feel the movement of the calf sucking the bottle.

Conclusion

It was not possible to get my head around at day 1 or day 101 or 1001 or 100001 what the world looked like for Tormod. Even today it is hard to understand. But today we know a lot more. It was a good Tormod and the rest of us have been able to share this journey. That we understood to look at his expressions. That we learnt when he turned his head away from us, his hands calmed and he held his breath, the he was with us 110 percent. That when he had taken us to the same department in the same store six times, the he had something to say. Something important. And eventually, we understood and met him and interpreted.

About the author

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Grete A. Steigen is the mother of Tormod Steigen Johnsgård (born in 1986). Grete is a milk farmer by profession and has run Johnsgård Tourist centre together with her family. Now she commutes all the way to Oslo for her dream job as teacher at Skådalen School for the congenitally deafblind.

References

Brede, K.S. (2013) *Språkutvikling gjennom meningsfull aktivitet*. Taktil språkutvikling hos personer med medfødt døvblindhet i tilknytning til bugging av "BUA-MI". Prosjektrapport 1:2, Drammen: Eikholt.

Brede, K.S. (2014) *Språkutvikling gjennom meningsfull aktivitet - Videreføring*. Taktil språkutvikling hos personer med medfødt døvblindhet i tilknytning til bugging av "BUA-MI". Prosjektrapport 1:2, Drammen: Eikholt.

Nafstad, A. og Rødbroe, I., (2013) *Kommunikative relationer*, Aalbrog: Materialecentret.

Nyling, P. (2003) *Inntryck som ger avtryck, leder til uttryck, – Att skapa kommunikation med vuxna dövblindfödda*. Dronninglund: Nordisk Uddannelsescenter for Døvblindepersonale (NUD).

Tactile language – a circle model

JENNY NÄSLUND AND BETTINA KASTRUP PEDERSEN

KEYWORDS: CIRCLE MODEL, TOOLS FOR ANALYSIS, TACTILE LANGUAGE, PERCEPTION, COMMUNICATION

There is a general lack of literature on tactile language and the development of language in the bodily tactile modality. The Nordic anthology *Bodily and Tactile Language Development*¹ introduced the concept to the professional field of congenital deafblindness in the Nordic countries for the first time in 2013. Prior to the anthology's release, an informal Nordic network had gathered under the auspices of the Nordic Welfare Centre and had explored and reflected on whether we could legitimately claim that language arising from the bodily tactile modality has value in human dialogue on an equal terms with verbal language, sign language and tactile sign language.

During the last ten years, the Nordic Network on Tactile Linguality has developed a circle model that scaffolds and helps to understand and remember the

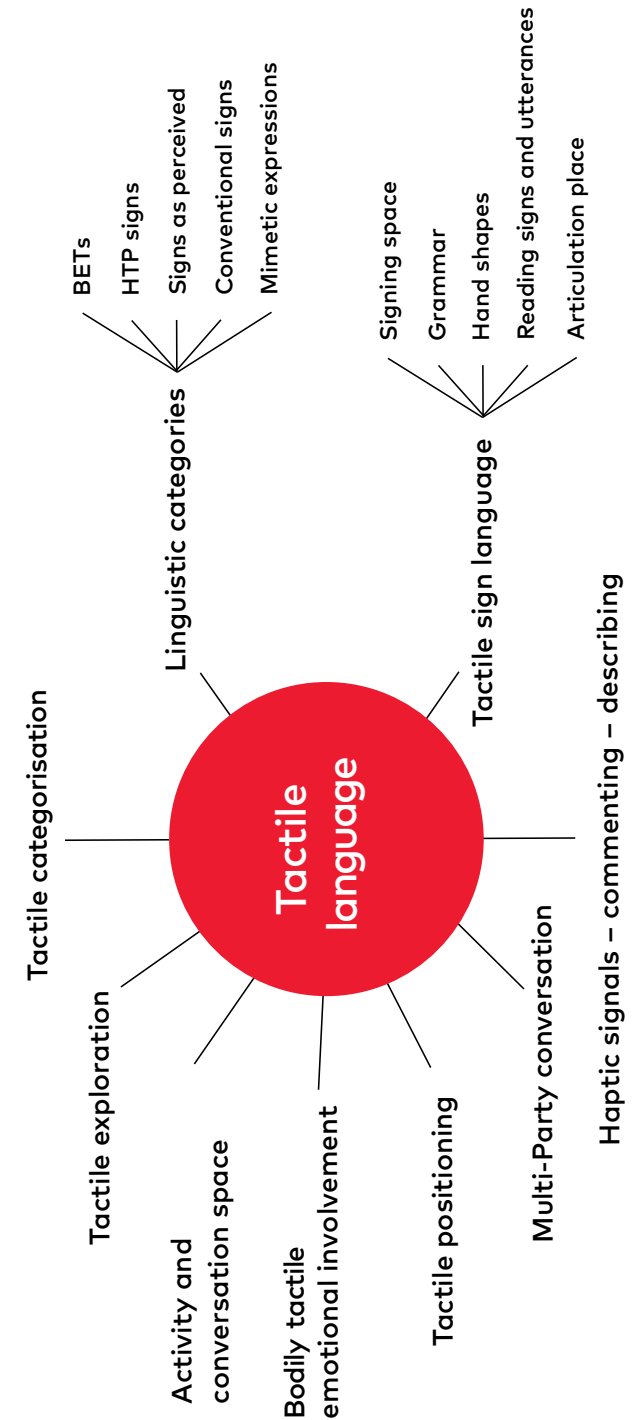
many elements of tactile language. The circle model helps to support analysis, providing cues about what to look for in the present dialogue with the purpose of formulating development goals or preparing activities and conversations.

The model is intended as a dynamic tool that can be expanded in order to incorporate new elements as our knowledge develops or new perspectives emerge.

On the next page, we will present the circle model in its present form and introduce the individual concepts, at the same time referring to the various chapters in this book, which delve deeper into the individual elements and go into more detail. In chapter 4 you can read more about the theoretical understanding of language and language development which underlies the circle model.

¹ Dammeyer and Nielsen (Eds.), 2013

The circle model on tactile language



Tactile exploration and categorisation

People with congenital deafblindness often use the tactile sense as they explore and examine their surroundings. The mouth and tongue are the best for distinguishing very fine details, the fingertips are used for slightly larger details (though still small, such as reading Braille etc.) and the whole hand is used to understand the size and form of an item. For example, objects are typically categorised in relation to their surfaces and texture, temperature, flexibility/manipulability, positioning in relation to the person as well as size in relation to the person's body rather than categorising by colour, function or sound. Similarly, the body is used to understand how one is positioned in relation to the object to be explored. The exploration forms the basis of creating meaning, categorisation and the understanding of similarities and differences, as well as physical sensations all of which leave a bodily and mental impression, which can form the basis of an expression. The way the person with deafblindness explores usually forms the background of the way he expresses himself and is therefore important to spot when to recognise and answer expressions. It is a much more time-consuming and mentally demanding process to explore and understand the world through the tactile sense than through sight. A process becoming even more complex as it takes place without the help of cultural language categorisation. You can read more about this demanding process in chapter 13, "Tactile cognition and language development".

Linguistic categories

In the Nordic network, we believe that if one regards expressions from people with congenital deafblindness as linguistic, they can be given a linguistic value in communication. In chapter 9, "Languaging between a child with congenital deafblindness and a bimodal, bilingual teacher", Camilla Foote introduces the concept of languaging for us. This concept helps us to understand what it really means when we in the network maintain that all humans are by nature linguistic beings. In his Master's thesis², Gøran Forsberg has proposed the following linguistic categories, which a communication partner can use as reference points to spot language originating from the body. We have chosen to incorporate these categories into our tactile language circle.

Bodily Emotional Traces (BETs)

When an emotional experience or activity leaves a bodily sensory trace, this can subsequently be expressed as a bodily emotional trace, localised in the body where it was sensed³. That is to say, a sensory experience in my body leaves a mental trace or impression, which can be expressed by a form of 'signposting' to where it was sensed.

These BETs can have very low readability because they are unfamiliar in appearance, not resembling any conventional sign. Often the person with deafblindness refers back to an episode which he and his communication partner have been part of⁴, and it is important that we consider these situations when analysing the BET.

² Forsgren, 2013

³ Janssen and Rødbroe, 2008

⁴ Ask Larsen, 2003



A good way to get the notion of signs as perceived is to try them on your own body. In pairs, you can work with talking/listening hands over hands and perform a sign – preferably one with movement.

You can read more about tactile bodily sensory perception in chapter 7, "Tactile sensations as the basis of the development of tactile language" and more on tracking signs in chapter 10, "Tactile iconicity used in sign constructions by persons with congenital deafblindness".

HTP signs (signs based on hyper tactile perception)

The construction of Hyper tactile perception signs (HTP signs) is based on the very specific exploration of the shape and/or function of an object and followed by shaping a sign based on this exploration. The sign has a tactile, iconic shape, also called tactile iconicity. This means, that the sign is performed in a manner that resembles how the exploration took place. You can try to make a HTP sign in the following way: Take a glass and hold it with your left hand. Explore the inner shape of the glass with your right hand. Now remove the glass, but keep your right hand in the same shape as when you explored the glass. Your right hand now forms a potential HTP sign. Potentially, in the sense that the hand shape only becomes a sign when you wish to express something about the glass using the shape of your hand. You can read more about HTP signs in chapter 10.

Signs formed as they were perceived

Signs as perceived are signs, which the person with deafblindness performs in the same way as he or she perceived them. This means that the shape of the sign looks very different from the original sign, and the direction, movement or localisation of the sign as perceived are often flipped. A good way to get the notion of signs as perceived is to try them on your own body. In pairs, you can work with talking/listening hands over hands⁵ and perform a sign – preferably one with movement, for example, "sailing". Notice how the listening hands are positioned over the talking hands in both shape and direction. Now remove the talking hands and perform the sign again with the listening hands, in the same way as perceived. Signs as perceived, like BETs, can be difficult to decode. If you encounter an expression that you think contains a sign as perceived, it may be a useful strategy of decoding the sign to put your own hands under the signer's hands, as if they were the talking hands and then check if the sign then emerges.

Conventional signs

Many people with congenital deafblindness use a limited repertoire of conventional signs. Often the signs are used in

⁵ Raanes, 2006

many different ways which differ from the usual use of the signs, for example if the person with congenital deafblindness wants to express himself about something he is thinking about or is interested in here and now, but does not have the conventional sign for. When conventional signs are used in creative and personal ways a meaning negotiation between the two communication partners is necessary. The partner must be prepared for such negotiations in all dialogues where the person with deafblindness spontaneously uses conventional signs. Especially when the person with deafblindness has a limited vocabulary.

A classic example is the use of the conventional sign for coffee, which is used both when the person wants coffee, but also when he wants to express something which relates to coffee. In chapter 15, "When Trine says GRANDMA...", Kari Schøll Brede describes just such a situation in which a conventional sign refers to and means something quite different from the original meaning of the sign.

Mimetic expressions

As we understand them, mimetic expressions, or imitative expressions, arise from the fact that experiences one has had through the body can be expressed in the same way as previously experienced. For example: riding a horse. The movement one senses in the body when riding a horse is expressed at a later time by moving as if you are riding.

When we look at these expressions from the perspective of sign language theory, we see that the mimetic expressions are similar to signs categorised

with an active iconicity. The expressions often have a low readability because the passive iconicity is missing – i.e. one does not express the conventional sign for riding before showing with the body (the active iconicity) how one rides. In chapter 16 "Apple tree and horse bus" you can read more about how mimetic, imitative expressions are recognised as linguistic utterances.

Tactile sign language⁶

Tactile sign language in communication with people with congenital deafblindness is not just about transferring the visual cultural sign language to the hands. Sign language is a visual, iconic language, meaning that many of the signs have originally been based on visual images that are transferred to signs. When communicating with people with deafblindness, in some cases there is a need to modify signs and adapt them to the individual's needs, some signs can be applied to the body rather than in the hands. As the signs are primarily perceived tactilely, it is important to be precise and accurate in the performance of the signs, and rhythm and tempo are also of great importance when signs are interpreted. In her Master's thesis, Caroline Lindström has looked more closely at the following elements in tactile sign language⁷:

Tactile conversational positions

Tactile conversational positioning is concerned on how we position ourselves and direct our bodies, hands and hand position in the interaction when conversing in the bodily tactile modality, so that we are sensorily accessible to each other. Communication in the bodily tactile modality needs to be prepared, as

it differs from the natural way of communicating with children who can see and hear. Therefore it is important that those around the person with congenital deafblindness are aware of how tactile conversational positions can optimally support language development for the individual in a specific situation.

Signing space

In visual sign language, the term "signing space" is used to describe a three-dimensional square in front of the head and upper body where the language is produced. In the signing space, the narrative is built up, and it is possible to refer back to something previously said by pointing to the place in the signing space where, for example, a person or an object was originally introduced into the conversation. In conversations with people with congenital deafblindness, the conversation partners need to be creative in reading the signing space, as it will often be larger. The whole body is in use, and to a certain extent the communication partners also use each other's body as signing space, just as the signing space can also include other objects located in the surroundings. The way people with congenital deafblindness refer to something in the signing room will not necessarily consist of pointing with the index finger, but may take several different forms. Perhaps the person will lead the partner's hand towards something or someone, just as they can direct their entire body, or a part of it, towards the object in question.

Articulation place

In tactile sign language, signs are placed on the body or hands in the same way as in visual sign language. This means that there is a specific position for where a sign should be performed on the body

both in visual and tactile sign language – a so-called place of articulation, which is an integral part of each sign. When communicating with people with congenital deafblindness, the communication partner must be more creative in relation to how and where on the body signs can be placed, so that they are adapted to the individual, are sensorily accessible and a negotiation of meaning becomes possible. Furthermore, one can use the place of articulation to "put into words" things that the person with congenital deafblindness expresses in the bodily tactile modality.

Articulation

In both visual and tactile sign language, each sign consists of specific movements, otherwise known as articulation. From a tactile sign language perspective, it is important to be attentive to and precise about articulation, because the meaning of a sign often changes if there is a change in movement. In communication with people with congenital deafblindness, movements are an important element in many ways, because movements are performed and perceived by the body. In tactile sign language, movements are used to support, strengthen and specify themes, or they can emphasise and express emotions that, in both verbal and visual sign language, would occur through facial movements and expressions. Variations and nuances of movement, for example shifts in rhythm and tempo, help to develop language in a playful way.

Chapter 14, "Partner's contribution to language development in a bodily tactile modality" describes some of the different bodily tactile strategies that a communication partner uses when supporting tactile sign language in a boy with congenital deafblindness.

⁶ Under this theme, the structure of the section differs slightly with the structure of the circle.

⁷ Lindström, 2017

If people with congenital deafblindness are to be given the same developmental opportunities, multi-party conversations must be facilitated so that all participants are sensorily accessible to each other.

Haptic signals – commenting – describing

Haptic signals are a method of visual and auditory description where an interpreter or other conversation partner provides subtle signs and signals on the back, shoulders or upper arm of the person with deafblindness without disturbing the ongoing conversation. By using haptic signals, a person with deafblindness or dual sensory impairments can follow more easily what is going on in the surroundings. Haptic signals are used as a supplement to sign language, tactile sign language or speech, and can be adapted to the individual using their own signals. Many useful individual haptic signs can be developed between two people who know each other's needs for interpretation well, for example between the deafblind person and his or her personal contact/interpreter or relatives. In chapter 18, "Haptic signals", Bettina Kastrup Pedersen elaborates on how to understand this concept and its application to people with congenital deafblindness.

Three-party/multi-party conversations

How do people with congenital deafblindness understand and gain access to what other people are talking to each other

about? And how can we draw attention to the fact that conversations can involve more than just two people? Tactile three-party/multi-party conversations are arranged in such a way that one or more persons are invited into a conversation with the person with congenital deafblindness. Children with sight or hearing are exposed from birth to conversations involving several persons. They are provided with opportunities to overhear other's conversations, thereby expanding their understanding of the world. This is an important part of children's language development. If people with congenital deafblindness are to be given the same developmental opportunities, multi-party conversations must be facilitated so that all participants are sensorily accessible to each other. The positioning of the participants involved is of paramount importance. Similarly, it would be appropriate to communicate and arrange the conversation based on the interests of the person with congenital deafblindness. You can read more about tactile multi-party conversations in chapter 17.

Tactile positioning

For many people with congenital deafblindness, their direct access to the world is limited to an arm's length. This means that the person with congenital

deafblindness and their communication partner should position themselves in such a way that they are bodily tactilely accessible to each other, since expressions from the entire body contribute to the conversation. It is essential for language development that the conversation partner can recognise, confirm and include the bodily expressions in the conversation. It is the partner's responsibility to organise the positioning, taking into account the physical and sensory capacities of the individual. Typical positioning is to lie/sit/stand face to face, lie/sit/stand side by side, or that the person with congenital deafblindness sits back to front of his conversation partner and uses him or her as physical support. If the positioning is such that the partner cannot see the facial movements of the person with congenital deafblindness, it is possible to put a mirror in front of them. Positioning where participants are sensorily accessible to each other encourages contact and reciprocity and creates optimal conditions for communication development. In this way, the experience of isolation can be minimised.

Bodily tactile emotional involvement

It is vitally important in communication that the conversation partner is emotionally present, mirroring and confirming the person with congenital deafblindness in her emotional expressions through the bodily tactile modality. This applies independently of the appearance or perception of the expression. Thus, the person with congenital deafblindness experiences a feeling of being recognised and taken seriously. Emotional involvement in the bodily tactile modality gives the partner the opportunity to elaborate and talk about the emotions the person with congenital deafblindness expresses. When all emotional expressions are

responded to and talked about, it leaves room for a negotiation of meaning, in which the conversation partner can suggest conventional bodily tactile signs for the emotions. You can read more about how emotional involvement is integrated into autobiographical memory in chapter 13.

Activity and conversation space

The activity space refers to the activity itself, i.e. what you do. For example, it may be an activity like peeling an orange, exploring an object, playing with different textures, going for a walk, etc. In the activity space we can do something together and the activity itself often generates bodily tactile expressions that can be held onto and spoken about in the conversation space.

The conversation space is the conversation about the activity. It may be before the activity, in preparation for what is going to happen, while doing something as a comment to amplify or expand the activity in question, or after the activity, by doing as or doing like we did in the activity, for example. Here, different tactile signs can be used: Referential, mimetic and/or conventional signs. Recycling and repetition are important strategies that you can work with in the conversation space. The challenge here is to be able to exchange between doing and talking about something without interrupting the flow of the activity. In chapter 11, "Language development in the tactile modality through outdoor activities", Joe Gibson writes more about integrating the activity into conversations about the activity, both before, during and afterwards.

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References

Ask Larsen, F. (2003). The-washing-smooth-hole-fish and other findings of semantic potential and negotiation strategies in conversation with congenitally deafblind children (unpublished Master thesis). Aarhus: University of Aarhus.

Dammeyer, J., & Nielsen, A. (Ed.) (2013). *Kropslig og taktil sprogudvikling. En antologi om forskellige sprogmodaliteters muligheder og umuligheder, undersøgt med afsæt i personer med medfødt døvblindhed*. Aalborg: Materialecentret.

Forsgren, J. A. G. C. (2016). The Emergence of Sign Constructions Based on Heightened Tactile Perception. The Proposition of a New Sign Category (unpublished Master thesis). Groningen: University of Groningen.

Janssen, M. og Rødbroe, I (2008). *Kommunikation og medfødt døvblindhed. Kontakt og samspil*. Aalborg: Materialecentret.

Lindström, C. (2017). Contributing to a bodily tactile language by transforming cultural customs. A case study of Partners Communicative Accommodations in Socialised Praxis based on a Bodily Tactile Modality and its Influences on a Bodily Tactile Culture (Unpublished Master thesis). Groningen: University of Groningen.

Raanes, E. (2006) *Å gripe inntrykk og uttrykk*. Interaksjon og meningsdanning i døvblindes samtaler. Doctoral study. Trondheim, Norway: NTNU The Norwegian Technical University

What do you mean NOW?

Context and meaning

KARI SCHJØLL BREDE

KEYWORDS: CONTEXT, SCENARIO, SCHEMATICS, HERE-AND-NOW SITUATION, MEANING MAKING

Most people have experienced getting into a conversation where you have to sit and wait for a while before you realise what they are talking about and can even contribute to the conversation. Some have probably experienced commenting on what they think is the topic of the conversation, only to have misunderstood and their contribution to the conversation is completely wrong. I experienced this often when I learned sign language. I had to strive to find topics in the conversation before I realised what the signs meant in this context and could participate in the conversation.

The starting point for such talks is knowledge and experiences we want to share. There are many words used to explain how we frame an experience and try to understand each other. Context, scenarios, themes, schematics, here-and-now-situations are words used to describe the framing of what we are talking about. Terms such as Base space¹ and Real space² are also used. Some of them are about the surroundings, and some are our thoughts about surroundings.

We often talk about what is happening here and now but sharing experiences and talking about past or future experiences is a human social activity most people enjoy doing. It can sometimes be difficult to get into a conversation in a familiar language in its own culture. It becomes much more difficult when both language and culture are different and you are in a learning process. Those who have arrived in a foreign country and had to learn the language and culture have experienced it. Similarly, we experience it when meeting people from foreign cultures with a different mother tongue.

This is the case for persons with minority languages as well, perhaps particularly for people with congenital deafblindness. Although they are born into our country's culture and language, they do not have the same prerequisites to participate when their sight and hearing do not work as normal.

How we experience the world and how we talk about it depends on how we perceive sensory impressions. Usually, the sight is the strongest sense, and hearing a good

number two. Learning through the body and interaction between the senses is important to all of us. When vision and hearing fail, we rely more heavily on the other senses – thoughts and memories form around what is experienced through the body and the expressions develop thereafter.

It is a challenge for family and close relatives to understand what is needed to find a common understanding. We can never quite know what the child has perceived of the situation we are in or what language can be used for what we experience. It is easy to believe that they are experiencing the same thing as us, and it is easy to think "I have put signs or words to this". Then why is this *linguaging*³ so difficult?

Here is a short example of how my daughter Trine, 31 years old, with Rubinstein Taybi syndrome and with deafblindness with a large hearing loss and severe impaired vision, describes a here-and-now situation of an unusual morning:

We are sitting in a boat, well known to both of us. It is lunchtime and there is food and a thermos with tea on the table. Trine, looking at me, opens her eyes, tilts her head. Listening. I interpret it as a mimetic sign: LISTEN!

Her hearing aid is the most powerful on the market. It gives her information about the world around her. It also reinforces and clarifies the sounds a normal hearing person do not register in the same way. Trine is listening. Then she repeats HU-HU-HU-hu-hu with her voice. It's the sound of a pigeon nearby. Then she smiles wisely. She signs BIRD while

making the pigeon sound in the same rhythm. I imitate, singing PIGEON with the voice in the "pigeon rhythm". Trine looks thoughtful, and then she turns her head toward the wind, her hair strokes her cheek and she shakes her hair softly and signs WIND. I vocalise the word and add the sign in the pigeon rhythm. Then she says SUN with signs and extends her hands to the hot sun, and I continue the same way. I suggest BOAT when she pauses. She repeats the sign BOAT, in the "pigeon rhythm", and then she shows with her body how the boat moves. She adds the WAVE and it becomes part of the mimetic sign in the body. She hereby shows how she senses the world. It is not just sound and image that is sensed, but movement in the body and the feeling of warmth and wind on her skin. She describes so well her own mental image or experience of the situation. She shows me her scenario, here-and-now. She continues with TRINE, MUM, FOOD, TEA, COFFEE and CHEESE, all in the rhythm the pigeon gave her... We build a common story and wrap the event into single words related to this scenario. Worth noting is the repetition of the signs TRINE and MUM in the history – it gives me a sense of belonging and trust in the situation.

This becomes her story, shared with me, her mother. I can recall and share her signs and story. Another important factor is the relationship mother-daughter, with a long and close relationship where we have great mutual trust to understand each other. An important part of that story might be the relationship with mum. How will she later use some of these items to start a conversation with other communication partners? One sign

¹ Ask Larsen, 2003

² Souriau, 2015

³ Foote, Linguaging, see chapter 9

can be the key to the whole scenario. If she makes a pigeon-sound, signing BOAT while with her body express the movement of the waves, will the staff in her residential home understand the content and join the story on the boat? For that to happen, I must at least have written and shared a good description of it, and her communication partner must read that description.

Even when you have shared experiences and knowledge about each other's interests, it can be an exciting journey to meet in a common understanding. For example, when Trine says GRANDMA and describes something different with her experience about her grandmother. You can read more about this in "When Trine says GRANDMA – what is on her mind?" in chapter 15.

Overextension is what we name it when children use a word in an unusual or non-cultural way to describe a situation. It is common in children's language development, and for people with deafblindness we often see such examples because language development and access to concepts are more complex. The child's (and it continues into adulthood) understanding and cognition often has a greater potential, and their thinking needs concepts for new experiences. One such example is described through Felix⁴, nine years old, who is deaf and has severe visual impairment. He uses tactile signs he knows from everyday life – calling warm things porridge and cold things jam, after his experience with hot porridge and cold jams. This he can use in advanced ways, such as confirming the bubble bath he just had was warm and nice.

Trine also shows how she uses her language to understand a situation better, by securing her own understanding of the context. This example shows an irregular method of asking a question, not common either in Norwegian or Norwegian sign language. It can easily be misunderstood if we do not allow a new understanding of the sign in this particular context: She came home to visit, and the staff comes in with her. Trine waves and says "bye-bye" to the companion. She doesn't mind whether the companion continues to be with us or not – our answer is what is interesting to her. It is not a statement that she does not want the person there, but a clarification of context; "Is this a visit where the companion leaves (i.e. that I will stay overnight) or will she stay here, and I will go back tonight?". The answer makes it clear to her what kind of visit it is. She has been told in advance whether it is a weekend visit or a dinner visit, but the communication through sight and hearing is probably not enough to ensure she has understood correctly. She makes linguistic strategies that give her confidence in her understanding. If the companion stays, it is a short evening visit.

An understanding of the context is important to be able to move in time from here-and-now, talking about the past or the future. Children with deafblindness are probably languaging⁵ much more about experiences than we can see. Fredrik⁶ showed this very clearly when he, as a completely blind and deaf five-year-old, sat in his little armchair and "bumped" up and down with the back of his head against the chair's fabric. In the begin-

⁴ Arman, 2009

⁵ Foote, Languaging, see chapter 9

⁶ Brede, 2008



ning, it was regarded as behaviour and not as language. It was just something he used to do. When the teacher became curious about what he was doing and began to look at it as a linguistic expression, car driving and subway driving was something that might be relevant. A focused ride on the subway changed the view on this "behaviour"; the ride focused on the subway movements, the feeling of sitting with the head against the fabric, and a new sign for the subway was tactically introduced, too. Almost immediately, Fredrik could add the new sign from the subway to the movement in the chair and the fabric that was familiar on the back of the head. Suddenly, the way of sitting became linguistic and even portable in time, when both Fredrik and the teacher were familiar with the context.

They could join each other in conversation about the subway. This could be used both for talking about the experience as a story, and for the planning of new subway trips for all communicators who knew about Fredrik and his way of talking about subway.

The context, the scenarios or the themes are perceived differently based on what senses we use, and what experiences we bring from the past. The ability to use memory, both short-term and long-term, is important in this context. Read more about memory and strategies in "Tactile cognition and language development" in chapter 13. I think most people have experienced that their child with deafblindness has a very good memory and shows that they both remember and

understand relationships better than we expect. They remember their own experiences using a feeling space, direction, pressure and movements. The senses in use, as described in the example of Trine and the boat, is the tactile sense that detects pressure and movement on the skin, and the joint and muscle senses called the proprioceptive sense. We also feel the balance, called the vestibular sense, working with the other senses. You can read more about this in chapter 7, "Tactile sensations as the basis for the development of tactile language".

Perhaps some sounds and visual impressions are also included in the overall picture. It provides another perspective, but still makes us remember the same situation. We can even talk about it if we as communicators manage to capture the topic of our brilliant children who do their best to tell us something⁷. First, we have to believe that they can and will tell their stories, and then try to understand how and what they sense. The language may look quite different, but it is the language of this person, and it expresses her thoughts. Imagine how much this is worth!

⁷ Brown, 2013

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Kari Schjøll Brede works as a Senior adviser at Eikholt Centre for deafblindness. Sign language, tactile communication and congenital deafblindness are among the most important fields in her work. Kari is also the mother of a young woman with congenital deafblindness. It was the daughter who awakened Kari's interest in sign language and made her study to become an interpreter and after that carry on to study communication and congenital deafblindness and take a Master of Science at the University of Groningen.

References

Arman, K. (2009). A child tries to make sense of the word. Dialogical and linguistic practice in the education of a boy with congenital Deafblindness. (Unpublished Master thesis) Groningen: University of Groningen.

Ask Larsen, F. (2003). The Washing-Smooth Hole-Fish and other findings if semantic potential and negotiation strategies in conversation with congenital deafblind children. (Unpublished Master thesis) Aarhus: University of Aarhus, Denmark.

Brede, K. S. (2008). Let me join your attenttion. A sign Language perspective on the Communicative togetherness with a child who are deafblind. (Unpublished Master thesis) Groningen: University of Groningen.

Brown, D. (2013). *Sinnenas samspel* – en artikkelsamling. Spesialpedagogiska skolmyndigheten, Sverige.

Souriau, J. (2015). *Blended spaces and deixis in Communicative Activities involving Persons with Congenital Deafblindness*. Journal of deafblind studies on communication.

On language development in children with congenital deafblindness

NEDELINA IVANOVA

KEYWORDS: TACTILE LANGUAGE, SEMIOTIC SIGN, LANGUAGE ACQUISITION

In this theoretical chapter the focus is on the process of language development in children with congenital deafblindness and how this process can be described. The chapter suggests that we look at the linguistic sign with Peirce's ideas in mind, where the emphasis is on the interpretant. The author concludes that an interdisciplinary theoretical method is needed to analyse how children with congenital deafblindness gain language skills.

The human being has the inherent ability to acquire language through vision and hearing. But individuals with congenital deafblindness also develop language through touch and in combination with spoken and signed language. Describing language development in children with cdb is difficult because of the lack of theory to explain the process. This theoretical chapter is an attempt to contribute to the discussion on language development in children with congenital deafblindness.

On Charles Peirce's sign

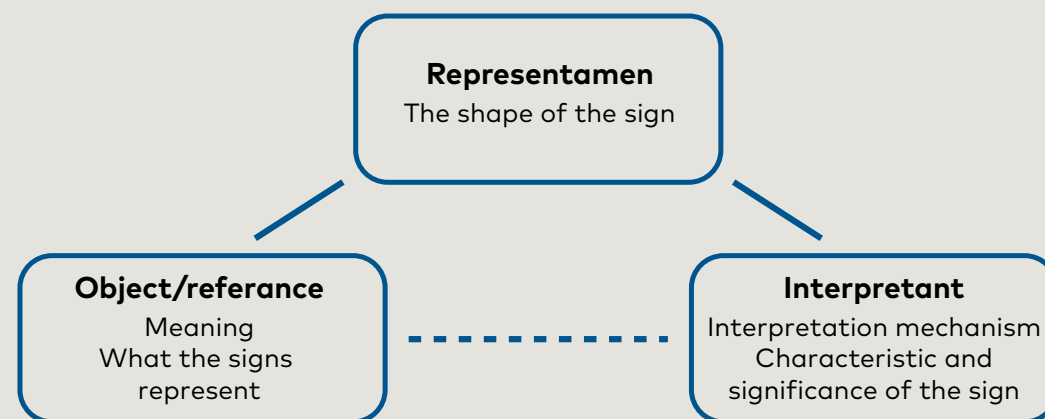
I have for a long time been contemplating what a semiotic sign in the tactile modality really is. I am fascinated by Peirce's ideas and his notion of the triadic sign.^{1,2,3} As Peirce says, nothing is a linguistic sign unless it is interpreted as one. Peirce's model consists of three related terms: sign or representamen, object and interpretant. Sign or representamen is the form that the linguistic sign takes (not necessarily material). Object is the phenomenon to which the

¹ Mladenov, 2006

² Ivanov, 2017

³ Ivanov searched for information for his MA thesis and discussed the semiotic sign and language acquisition for children with congenital deafblindness with me. Ivanov's MA thesis reflects these discussions and my theoretical background. I want to thank Ivanov for the permission to use selected passages from his thesis.

Figure 1 Charles Peirce's sign

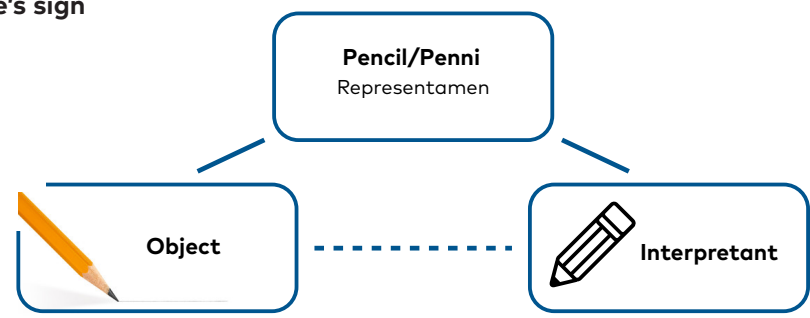


linguistic sign refers. The interpretant is the meaning coming from the perception and given to the linguistic sign. In Peirce's opinion, the linguistic sign is something that stands for someone or something in some sense or role. The linguistic sign represents the idea which the individual lends it, based on his or her own experience and knowledge. This individual idea is the foundation of the representamen.⁴ The sign can be primary when it refers to itself; secondary when it refers directly to the object and tertiary when it refers to its interpretant. To take an example, see figure 2, if we look up the word penni in

an Icelandic-English dictionary we get the word pen. The word *pen* has the same meaning as the word *penni* – a tool for writing. But is a *penni* a *pen*? According to Peirce, we need the interpretant since people may have different impressions. But if we get only one impression then we do not need an interpretant, because there is no variety that needs to be narrowed down to what Peirce refers to as oneness. According to him the sign has its own being. The sign has its meaning which is the basis for interpretation, in a system built on interpreting signs. Without the interpretant there is no semi-

⁴ Mladenov, 2006

Figure 2
Charles Peirce's sign



otic sign. What makes his model different from the models of Saussure⁵ and Locke⁶ is that Peirce expects a dynamic interpretant and the relations are triadic. Saussure's and Locke's models are static, and the relations are dyadic.

On language acquisition and tactile language acquisition

Fromkin, Rodman and Hyams⁷ discuss what it means to know a language. Their ideas are based on Chomsky's theory of universal grammar and the inherent ability to acquire language. To master a language includes being familiar with the phonology of the language, knowing the meaning of words/signs, being

able to create countless combinations of sentences, knowing the difference between acceptable and unacceptable sentences and being able to adapt the linguistic tonality depending on the situation. The brain is biologically constructed to be sensitive to young children's language acquisition⁸. Shield⁹ emphasises that nobody acquires a language alone in isolation from others and that the language must be used in the individual's environment. Different theories and views of L1 and L2 acquisition¹⁰ provide explanations based on the viewpoint of the period in which they emerged and of the governing ideology of the time (such as behaviorist theory, Skinner¹¹, cognitive theory, Ausubel¹²; universal grammar,

⁵ Bally, & Sechehayé, (ed.), 1959

⁶ Locke, 1690

⁷ Fromkin, Rodman & Hyams, 2014

⁸ Werker & Tees, 2005

⁹ Shield, 2010

¹⁰ L1 acquisition refers to the process of acquiring the native (first) language in childhood regardless of modality. L2 acquisition is the acquisition of an additional language in children and adults regardless of modality.

¹¹ Skinner, 1957

¹² Ausubel, 1968

Chomsky¹³; Monitor theory, Krashen¹⁴; connectionism, Gasser¹⁵). Scholars do not quite agree on how the process of language development takes place, what matters most or the necessary conditions for a child to gain a rich language. Shield's research is based on Chomsky's theory that all children are born with the ability to acquire language, regardless of whether they are hearing, have a hearing impairment, deafness or disability, and regardless of whether the child acquires a spoken or signed language. It is dependent on the environment to cultivate the language and create conditions for language acquisition/learning, i.e. as described in social interaction theories.^{16,17,18,19,20,21}

Both Ask Larsen²² and Nicholas²³ discuss tactile language acquisition. They see tactile language as L1 with regard to children with congenital deafblindness. Their research is focused on whether it is possible to term it acquisition of tactile language since many children with congenital deafblindness learn about the outside world mostly through touch. Larsen approaches the subject from the viewpoint of semiotics whereas Nicholas bases his theories on the activity of the brain. They find strong evidence for L1 acquisition of tactile language for persons with congenital deafblindness.

¹³ Chomsky, 1972

¹⁴ Krashen, 1982

¹⁵ Gasser, 1990

¹⁶ Bruner, 1983

¹⁷ Paul, 2001

¹⁸ Janssen, Riksen-Walraven & van Dijk, 2002

¹⁹ Souriau, Rødbroe & Janssen, 2008

²⁰ Souriau, Rødbroe & Janssen, 2009

²¹ Nafstad & Rødbroe, 1999

²² Ask Larsen, 2013

²³ Nicholas, 2013

Nicholas describes this further in chapter 13 of this book.

Current contributions

In this section the linguistic sign in the tactile modality will be discussed shortly and thoughts on language development in cdb children are presented.

On the semiotic sign in the tactile language

Peirce's ideas are, in my opinion, closely linked to the realities of people with congenital deafblindness, as the individual himself or herself creates the meaning (overall idea of an object or phenomenon, or anything) about a referent (which may be a thing, a phenomenon or anything) and then associates this meaning with a representamen (what it refers to, an object, phenomenon or anything). It is the meaning that each individual lends that maintains the connection between the referent and the representamen. There are no direct links between the referent and the representamen without meaning/an interpretant. A linguistic sign will not emerge until it is interpreted as such. But how does a child with congenital deafblindness learn the meaning of the sign? The process of language development is discussed in the next section.

On language development in children with congenital deafblindness

We know from research^{24,25,26} that tactile language exists because areas in the brain connected to language are illuminated if there is stimulation through touch. The brain is thereby open to language through touch. However, when studying children with congenital deafblindness, I cannot tell which process is operative: language acquisition, language learning, language evolving or language studying. Perhaps that makes Krashen's theory²⁷ useful for analysing children with congenital deafblindness, as he does not distinguish between language acquisition and language learning but claims the process to be unconscious. However, organised teaching is always conscious and that is why we talk about language learning. Language learning is a conscious knowledge of rules. The individual also needs to find motivation for him or her to develop a language.²⁸ Chomsky²⁹ says that children come into the world with the innate ability to acquire any language, but that happens only if the language is present in the child's environment. The child acquires it unconsciously without doing anything. Read more about this in chapter 5. Chomsky claims that children are programmed to acquire language as they achieve this very quickly. According to Ausubel³⁰, the individual can receive new content if it is significant to him or her

// This cognitive theory states that the process of language evolving is meaningful, and that the language skills of the individual change as skills increase. The inner cognition is the driving power.

and can be linked to what he/she already knows. This cognitive theory states that the process of language evolving is meaningful, and that the language skills of the individual change as skills increase. The inner cognition is the driving power. As Peirce points out, the sign is not a sign unless it is interpreted as a sign.³¹ Similarly, the process of language evolving is not productive unless the person himself/herself feels that he/she has gained something new. In Skinner's opinion³², operant conditioning is the ground for language evolving. The child does not know about language at birth, but acquires it in a chain order, where a relationship is created, and a new unit emerges in relation to another entity that already exists. Gasser³³ states that children do not possess an innate ability or equipment specifically intended for language, but that the knowledge emerges with the development of the totality. The connections can be changed and reorganised to create new know-

ledge, and this is associated with the environment. Social interactions are of great importance for language development.^{34,35,36,37}

My intention is not to name the exact process that children with congenital deafblindness go through but to try to understand this process. The process of language development is complex, and it is important to think about it as an informal and unconscious process (language acquisition) in formal settings (language learning) where the child learns in an unconscious (language evolving) or conscious (language studying) way. The basis for the whole process is social interaction with the environment and the building of connections in the brain.

Children with congenital deafblindness acquire the tactile language as their native language.

Conclusion

There does not seem to be any one theory which applies to the process of language development in children with congenital deafblindness. The nature of the theories differs, but they all have in common that they are based on rationalism, namely thought and thinking as the basis for knowledge independent of modality (spoken vs. signed vs. tactile). Perhaps it is time for an interdisciplinary approach to language development in children with congenital deafblindness combining what best applies to the process from each theory.

³⁴ Janssen, et al., 2002

³⁵ Souriau, Rødbroe & Janssen, 2008

³⁶ Souriau, Rødbroe & Janssen, 2009

³⁷ Nafstad & Rødbroe, 1999

²⁴ Obretenova, et al., 2010

²⁵ Yasuhiro, O. et al., 2004

²⁶ Nicholas, 2013

²⁷ Krashen, 1982

²⁸ Krashen, 1982

²⁹ Chomsky, 1972

³⁰ Ausubel, 1968

³¹ Mladenov, 2006

³² Skinner, 1957

³³ Grasser, 1990

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References

Ask Larsen, F. (2013). Acquisition of a body-tactile language as first language. I J. Dammeyer og A. Nielsen (ed.), *Kropslig og taktil sprogudvikling. En antologi om forskellige sprogmodaliteters muligheder og umuligheder, undersøgt med afsæt i personer med medfødt døvblindhed* (pp. 94-122). Aalborg: Materialecentret.

Ausubel, D. P. (1968). *Educational psychology: a cognitive view*. Montreal: Holt, Rinehart et Winston.

Bally, C. & Sechehaye, A. (ed.). (1959). *Course in general linguistics*; in collaboration with Albert Riedlinger; translated, with an introduction and notes by Wade Baskin. New York: The Philosophical Library Inc.

Bruner, J. (1983). *Child's Talk: Learning to Use Language*. New York, NY: Norton.

Chomsky, N. (1972). *Language and mind*. New York: Harcourt Brace Jovanovich.

Enerstvedt, R. Th. (1996). *Legacy of the past. (Those who are gone but never left)*. Dronninglund: Nord-Press.

Fromkin, V., Rodman, R. & Hyams, N. (2014). *An introduction to language* (10. edition). Boston: Wadsworth.

Gasser, M. (1990). Connectionism and universals of second language acquisition. *Studies in Second Language Acquisition*, 12(2), 179-99.

Ivanov, Ch. (2017). Boð- og tjáskipti barna sem eru með meðfædda samþætta sjón-og heyrnarskerðingu og nám þeirra. (On communication with cdb children and their learning). Unpublished M.A. thesis. University of Iceland, Reykjavík, Iceland.

Janssen, M. J, Riksen-Walraven, J. M., & van Dijk, J. P. M. (2002). Enhancing the quality of interaction between deafblind children and their educators. *Journal of Developmental and Physical Disabilities*, 14(1), 87-109.

Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Oxford: Pergamon.

Locke, J. (1690). *An Essay Concerning Humane Understanding. Book III: Words*. London: Elizabeth Holt for Thomas Bassett.

Mladenov, I. (2006). *Conceptualizing Metaphors: On Charles Peirce's Marginalia*. Oxford and New York: Routledge.

Nafstad, A. & Rødbroe, I. (1999). *Co-creating communication. Perspectives on diagnostic education for individuals who are congenitally deafblind and individuals whose impairments may have similar effects*. Dronninglund: Nord-Press.

Nicholas, J. (2013). Tactile cognition and tactile language acquisition - an information processing approach. I S. Køppe, J. Dammeyer og A. Nielsen (ed.), *Kropslig og taktil sprogudvikling. En antologi om forskellige sprogmodaliteters muligheder og umuligheder, undersøgt med afsæt i personer med medfødt døvblindhed* (pp. 47-79). Aalborg: Materialecenteret.

Obretenova S., Halko M. A., Plow E. B., Pascual-Leone A. & Merabet L. B. (2010). Neuroplasticity associated with tactile language communication in a deaf-blind subject. *Frontiers in Human Neuroscience* 3, 60.

Paul, P.V. (2001). *Language and deafness*. (3th edition). San Diego, CA : Singular.

Shield, A. M. (2010). *The signing of deaf children with autism: Lexical phonology and perspective-taking in the vicual-spatial modality*. Doktorsavhandling, The University of Texas at Austin, Austin.

Skinner, B. F. (1957). *Verbal behavior*. New York: Appleton-Century-Crofts.

Souriau, J., Rødbroe, I. & Janssen, M. (2008). *Kommunikation og medfødt døvblindhed III: At skabe mening*. Aalborg: Materialecentret.

Souriau, J., Rødbroe, I. & Janssen, M. (2009). *Kommunikation og medfødt døvblindhed IV: Overgang til kulturelt sprog*. Aalborg: Materialecentret.

Yasuhiro, O., Katsumi, D., Masashi, T., Kazuhiro, N., Hiroshi, N., Aya, I., Takako, I., Masao, I., Takuya, Y., Naohiko, O., Jun, H., & Takeshi, K. (2004). Cortical processing of tactile language in a postlingually deaf-blind subject. *NeuroReport*, 15 (2), 287-291.

Werker J. F. & Tees R. C. (2005). Speech perception as a window for understanding plasticity and commitment in language systems of the brain. *Developmental Psychobiology*, 46(3), 233-251.

Language must be sensorily accessible

ARNFINN MURUVIK VONEN

KEYWORDS: SIGN LANGUAGE, TACTILE SIGN LANGUAGE, ACCESSIBILITY, DEAF CHILDREN, CONGENITAL DEAFBLINDNESS

The chapter argues for the competent use of tactile language in the education of children with congenital deafblindness by drawing parallels with the situation of deaf children and how visual sign language can "unlock the curriculum" for deaf children, because it is sensorily accessible.

In 1989, a report came out at Gallaudet University in Washington DC, USA. The report was called *Unlocking the curriculum* and was written by three researchers at the university.¹ The report was not published in a scientific journal or as a chapter in a published book; it was just printed as part of a series of working papers from the university's research institute. Still, it was read by very many and led to much debate, in the USA as well as in many other countries. What was written in this report, and why is it relevant to a book about language development in children with congenital deafblindness?

¹ Johnson, Liddell & Erting, 1989

The report *Unlocking the curriculum and the objections to it*

The report was about education of the deaf. The first part of the report was called "The failure of deaf education". And the first sentence of the report went like this: "The education of deaf students in the United States is not as it should be." The authors then continued by showing what was the problem, and how the educational system could solve the problem if the right actions were taken. According to the authors, there were two main causes of the poor results in education of the deaf: first, deaf children fundamentally lacked access to the contents of the curriculum at their grade level; and second, it was generally accepted that deaf children could not be expected to achieve at their grade level. In brief: poor access and low expectations. The short version of the solution sketched by the authors may also be phrased in brief: access to sign language, and education of adults so that they will expect age-appropriate development in deaf children.

The focus of this chapter is not on this report, and neither is it on why the problems it raises are still far too recognisable in the Nordic countries, long after the sign languages here have been formally recognised as languages of education and school subjects. However, we shall look more closely at the authors' point about access to the contents of the curriculum. The report from 1989 says the following about the situation deaf children are in when they do not get access to a visually based language environment, that is, to a sign language environment: "It appears to us to be unrealistic to think that a person who does not know a language and who cannot receive it in the form presented

could learn much from someone trying to communicate in that language."

In Johnson et al.'s phrasing, this point almost becomes so self-evident that the reader thinks it should be superfluous: If a person – a child, for example – is to learn something through a language, then this person must have sensory access to this language. If not, then not much can be expected in the way of results. If a child who cannot hear is offered education in a spoken language, then the child cannot "receive it in the form presented". The child will spend disproportionately much time and effort trying to understand what is being said, and perhaps rehearsing to say it himself or herself, so that little is left to learn the contents that were going to be conveyed.

Nevertheless, many teachers of deaf children reacted against the report. For example, Debra VanBinsbergen² wrote that she agreed with everything in it in and of itself, but that she was worried about how one could take the proposed actions:

- It was too much to require of hearing parents of deaf children that they should learn sign language in addition to everything else they had to contend with, having a deaf child.
- It was not easy to get hold of deaf adults who could be available as language models, and not easy for hearing people to get access to the social arenas of the deaf.
- Parents were worried that hearing siblings might have problems in their language development because of the use of signs at home.
- Teachers were not proficient enough in sign language.

² VanBinsbergen, 1990

- The children would have a poorer spoken language development if the spoken language was used less.
- The schools would not use the spoken language laboratories they had spent so much money acquiring. [Today, one might have said in a similar way: The children would not sufficiently use the cochlear implants that the government had spent so much money acquiring and implanting.]
- Sign language would function poorly as a common language in the diverse small groups of hearing-impaired pupils that were the reality out in ordinary schools.

All these objections are understandable in and of themselves, and in line with what many might say is "common sense", and probably, such are the objections that still exist and may explain why many deaf pupils do not receive the linguistic provision they are legally entitled to. The problem is that all the objections – with the exception of the one that less use of spoken language leads to poorer spoken language – are about other people than those whose future is at stake: the children who hear poorly. They are about concerns for parents, deaf clubs, hearing siblings, teachers, and local educational institutions.

To this, one can answer: These concerns may be taken care of, at least to a certain degree, through the designing of systems. In Norway, for example, mechanisms have been designed, via legislation and other public actions, which have as their task to meet these challenges. The objection that less exposure to spoken language leads to poorer spoken language development is, as opposed to the others, about the children themselves, but it is first and

foremost incorrect – it is justified in a myth about the brain of a child being like a limited container in which languages compete for space. Today, we know that the languages of bilinguals may support each other, so that a good development in the more accessible language also paves the ground for progress in the less accessible language.

Three insights

There are at least three insights to be taken along from the discussion around Unlocking the curriculum from the education of, and language development in, the deaf to the education of, and language development in, the deafblind. First: ***Language must be sensorily accessible.*** This may seem banal and self-evident, but it is so easy to overlook for someone who has the sense that the other totally or partially lacks. Second: ***The concern for the child must outweigh other concerns.*** For example, it is so easy to use the fact that sign language may be hard to learn for a hearing teacher, as an argument for refraining from using sign language in education, even if it would have been better for the child. Third: ***Good will does not necessarily mean good implementation.*** Even if, for example in Norway today, many mechanisms have been established to make full access possible, this does not mean that the mechanisms function well enough. Among other things, it is probable that the objections are living on in too many of those who have a responsibility for the implementation of the mechanisms.

Accessible language for children with congenital deafblindness

Let us now have a look at the education of, and language development in, children with congenital deafblindness. Here, we are dealing with a sensory barrier

against auditorily based language development (spoken language) as well as against visually based language development (sign language). This puts children with congenital deafblindness in a very different initial position with respect to language development than both hearing children using spoken language and seeing (deaf and hearing) children using sign language. Even if nothing prevents, in principle, that a language (in the sense of "cultural language" in Inger Rødbroe's usage³) may have the tactile modality as its fundamental modality, we do not know of any language that has it. Such a language would, then, have been developed spontaneously by a group of children through tactile communication among themselves in childhood, and later transferred to new generations.

The closest we get to a tactile language in today's world, are tactile versions of spoken and signed languages, respectively. From the history of the deafblind, we know that tactile spoken language communication has been used, especially through the TADOMA method, in which the deafblind person keeps his or her fingers in contact with the conversation partner's mouth, cheeks, chin and throat. Experience shows that the method is demanding, and today it is probably not much used.

Written language, of course, is based on spoken language, and, therefore, tactile fingerspelling is, ultimately, spoken language based, too. Tactile fingerspelling is carried out starting from variants of the alphabet, such as Braille, Lorm, writing on the palm of the hand, or tactile varieties

of those one-handed and two-handed alphabets that are used to name the letters of written language in the various sign languages. However, just as spelling takes time in the spoken modality as well, communication with tactile fingerspelling is rather time-consuming work. In addition, fingerspelling has the drawback that, just like written language, it has its limitations with regard to the expression of emotions, attitudes, and other content that does not appear directly through the written words.

In this respect, tactile communication in sign language is more efficient. Among signing deaf people, progressive loss of vision is relatively widespread, especially among persons with Usher's syndrome. When primarily signing deafblind people have the possibility of meeting each other as well as other signers, a tactile variety of the local sign language may appear, in which the conversation partners' hands touch each other. Linguistic research by Johanna Mesch⁴ and Eli Raanes⁵, among others, has documented interesting properties of these tactile sign language varieties. Even though their sign vocabulary and much of their grammar come from the respective visual sign language, they also have properties that we do not find in the visual sign languages, such as meaningful alternations in the relative positions of the conversation partners' hands, and the positions of the hands in the signing space between the conversation partners. Elements of visual sign language that cannot be rendered in the tactile modality, find other ways of expression in tactile sign language. In tactile sign language, therefore, we have

³ Rødbroe, 2010

⁴ Mesch, 2002

⁵ Raanes, 2011



A child with congenital deafblindness will have the best conditions for linguistic and communicative development if he or she is exposed to a tactilely fully accessible language.

a spontaneously developed and fully accessible linguistic modality for persons with reduced capacities in both vision and hearing. Read more about linguistic modalities in chapter 9 about languaging.

A seeing deaf child will have the best conditions for linguistic and communicative development if he or she is exposed to a visually fully accessible language, and in similar fashion, a child with congenital deafblindness will have the best conditions for linguistic and communicative development if he or she is exposed to a tactilely fully accessible language. The seeing deaf child should have access to the visual language through persons who are highly proficient in it, and in similar fashion, the child with congenital deafblindness should have access to the tactile language through persons who are highly proficient in it. Such persons will, to the extent that their linguistic competence is combined with educational competence, also be able to respond adequately to the child's own bodily tactile utterances. You can read more about this in several of the chapters in this book, for example in chapter 9 on a teacher and a student and in chapter 13 on strategies and

tactile working memory. Such persons will also be able to accommodate their own utterances towards the child, in the awareness that possible visual and auditory elements in these utterances will be unclearly perceived in the best instance, and not at all in the worst instance. Such persons will probably not, for example, have a great need of accompanying their utterances towards the child with the use of their voice, as a kind of "safe" anchoring of the utterance in their own stronger language. Such an anchoring does not become particularly safe for the one who does not have full sensory access to it.

Conclusion

Tactile sign language has not, like visual sign language, emerged spontaneously among children who have grown up with it as their first language. In this perspective, tactile sign language for children with congenital deafblindness is not quite comparable with visual sign language for deaf children. However, many of the points in Johnson et al. (1989) may still be transferred to tactile communication. It is through the tactile sense that the child with congenital deafblindness can most easily "unlock his or her curriculum".

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References

Johnson, R. E., Liddell, S. K. & Erting, C. J. (1989) Unlocking the curriculum: principles for achieving access in deaf education. Gallaudet Research Institute Working Paper 89-3. Washington DC: Gallaudet University.

Mesch, J. (2002) Døvblindas teckenspråkskommunikation. Working text no. 40. Dronninglund, Danmark: Nordisk Uddannelsescenter for døvblindepersonale.

Raanes, E. (2011) Tegnrom og taktilt tegnspråk. (Signing space and tactile sign language.) Norsk Lingvistisk Tidsskrift 29.1.54-86.

VanBinsbergen, D. (1990) One teacher's response to «Unlocking the curriculum». *Sign Language Studies* 69.327-331.

Rødbroe, I. B. (2010) Døvblindeområdets historiske udvikling – pædagogiske paradigmer og konsekvens for praksis. Aalborg, Danmark: Videnscenteret for døvblindfødte.

VanBinsbergen, D. (1990) One teacher's response to «Unlocking the curriculum». *Sign Language Studies* 69.327-331.

«We hear with our brains»

ROLF MJØNES

KEYWORDS: HEARING, SPEECH PERCEPTION, AUDIOVISUAL SPEECH, MCGURK EFFECT

In this chapter I will address a new understanding of functional hearing that takes the focus away from the ear and onto the brain. I will explain the term "audio-visual speech perception" and put it in the context of how the brain treats stimuli from our eyes and ears during communication. This approach does not apply solely to oral communication, but to all situations in which we have access to meaningful sound, light and tactile stimuli.

Brain hearing

The field of audiology has historically been preoccupied with the functioning of the middle and inner ear, and its sensitivity to sound waves. The audiogram, which describes our ability to register beeps, is still the diagnostic gold standard for hearing measurements¹, and most hearing aids are programmed according to our ability to hear beeps in the 125 to 8000

hertz range. However, this one-dimensional understanding of hearing has been changing, and today we have new insights that transform the way we view hearing function and hearing rehabilitation.

Two things have become apparent. We hear with our brain, not with our ears, and furthermore, the brain perceives language through both our ears and eyes.

¹ Metz, 2017



In our ears are thousands of cells that convert sound into electrical signals, which are fed to the brain through a complex network of neural pathways. A hearing impairment will for most of us mean that we have lost some of these cells – either as a natural consequence of ageing or because of external factors such as loud noises, illness, or hereditary factors. Whatever the cause is, a loss of hearing cells causes the signal from the ears to become distorted, which in turn gives the brain less information to work with. In other words, the ear detects and transmits sounds, but it is the brain that interprets these signals and makes sense out of these sounds.

The brain employs several clever techniques to process the signal it receives from our two ears. Some of these enable our directional hearing – the ability to know where a sound is coming from. Others filter out noise and allow us to focus on a single voice in a crowd.¹ This requires a close and well-functioning collaboration between the auditory cortex and various centers in the brain that are responsible for different tasks of signal processing. Read more about the inner workings of the brain in chapter 13, "Tactile cognition and language development". Some forms of hearing loss occur because of malfunction somewhere in this elaborate auditory processing network. People with auditory processing disorders may hear sounds just as well as anyone, but still struggle to understand speech in social situations.

This leads us to insight number two: that our speech understanding is an audio-

visual process. What this means is that the brain uses visual information to supplement and enhance the auditory information from the ears, combining the two streams of information into something more than the sum of its parts. When observing a person talking, the visual information will greatly affect how much and what you hear. As an audiologist, I sometimes hear my patients tell me that they need to put their glasses on in order to hear me better! To me, this is a clear expression of our intuitive desire for more information, so that our brains can extract the most out of the situation.

More and more research on this topic has gradually unveiled a great deal of evidence of just how important our vision is to our functional hearing. Several studies have looked at how our ability to repeat what we hear is influenced by how well we can see the person we are listening to.² In noisy situations where you must strive to follow the conversation, you can expect to understand anywhere from 25 to 50 percent more words when you can see the person you are talking to as well as listening to them.³

This ability to extract useful, communication-enhancing information from the visual domain is not (as you might think) exclusive to people who are trained in this task; it's an ability most of us share. In fact, it has been shown that even people with substantial vision impairment may have a significant benefit from watching the speaker's face. This advantage does decrease with the severity of the impairment but seems to provide some benefit up to a visual acuity of 20/200, the equiv-

McGurk Effect



"VA"



"BA"

alent of only being able to identify the largest letter of the classic Snellen-chart visual acuity tests.⁴

Even though most of us will deny having much lip-reading ability, it is nevertheless a fact that various mechanisms in our brains work constantly to integrate our visual and auditory senses to create an enhanced signal that improves our functional hearing ability. Few of us can lip read, but we all subconsciously utilise our eyes to support our ears in social situations.

The famous McGurk effect provides a striking demonstration of the visual influence on speech perception. The McGurk effect refers to the phenomenon that occurs when the eyes and ears receive conflicting information about the same auditory event. For example, if you see a video of a man who is seemingly repeating the (nonsense) word "VA", like this: "VA VA VA ..." while the actual sound you hear from the speaker is "GA", as in "GA GA GA", then the brain will hand the victory to the eyes and make sure you hear "VA" and not "GA", even though this is the wrong decision. If you close your eyes during this

test, you will hear and correctly identify the sound as "GA" – as soon as you open your eyes again the brain reverts to "VA" and no amount of concentration or effort on your part will allow you to hear the correct sound as long as the eyes remain open. This effect is nearly impossible to resist. This really illustrates how much visual information influences our perception of sounds.

This insight into the workings of our brain means that we can no longer treat speech perception and verbal communication as purely auditory phenomena, but also as audio visual. Furthermore, we can conclude that the brain endeavours to make use of all our senses to extract meaning from our environment.

People with deafness primarily use their eyes in communication with others. People with deafblindness people can use their tactile sense to communicate, and to enhance their understanding of context and meaning from their surroundings. The importance of access to informal information is often undervalued.

² Avan et al., 2015

³ Campbell, 2008

⁴ Alsius et al., 2016

⁵ Erber, 1979

We use our vision actively in social situations, both consciously and subconsciously. We extract information that helps us participate meaningfully in conversation. There is a reason we think it is easier to trust people we have met, even briefly, rather than people we have just talked to over the phone. A person with severe hearing and vision impairment can gain, through tactile communication, important contextual information in social situations. This can be information about the people in the room and where they are located, the facial expressions they exhibit and who is coming and going. There are many examples of this, but the amount and extent of tactile information that a person with deafblindness desires, as well as the kind of information desired is clarified with the interpreter in advance. In this way, the tactile sense can be used to access the information that the eyes and ears cannot convey.

Another example of such reorganisation of sensory processing is found in some people who have learned to "see" their surroundings through their ears by perceiving the reverberations of sound from objects. Experiments have shown that we can even create new senses in humans! People with blindness can over time learn to "see" through a camera that sends electrical impulses to the tongue⁵. People with deafness can learn to "hear" and may even understand speech through vibrations from special clothing that covers the upper body with small vibrating points.⁶

The brain turns out to be very flexible, and very hungry for stimuli that help it to make sense of its surroundings. Just how or in

// If we as hearing care professionals only focus our rehabilitation efforts on the ear, then we ignore a significant part of the challenge.

what format this stimulus arrives to the brain seems to be of secondary importance. Over time, the brain will learn to use the information in a way that helps make sense of the world.

This understanding of speech perception should have consequences for how we think about hearing rehabilitation. The biggest challenge for people with hearing impairments is that they find it difficult to perceive speech in noise; i.e. social situations with more than two participants. If we as hearing care professionals only focus our rehabilitation efforts on the ear, then we ignore a significant part of the challenge; we forget that the brain needs the best possible signals from both the ears and the eyes and in many cases also the tactile sense. Hearing aids, external microphones and other technological gadgets may very well be an important part of the solution but should not be the only one we consider. Tailored vision rehabilitation and coping strategies should also be included to ensure the best possible result for the people we are here to help. In this way, the tactile sense can be used to access the information that the eyes and ears cannot provide. Read more about Haptic Signals in chapter 18.

⁶ Grant et al., 2016

⁷ Grant et al., 2016

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References

Alsius, A. et.al. (2016) High visual resolution matters in audiovisual speech perception, but only for some. *Attention, Perception, & Psychophysics* Volume 78, Issue 5.

Avan, P. Et.al. (2015) Importance of binaural hearing. *Audiol Neurotol.* 2015;20

Campbell, R. (2008) The processing of audio-visual speech: empirical and neural bases. *Philos Trans R Soc Lond B Biol Sci.* 2008 Mar 12

Eagleman, D. (2015) Can we create new senses for humans? TED talks 2015.

Erber, N. (1979) Auditory-Visual Perception of Speech with Reduced Optical Clarity. *Journal of Speech, Language, and Hearing Research*, June 1979, Vol. 22.

Grant, P., Spencer, L., Arnoldussen, A., Hogle, R., Nau, A., Szlyk, J., ... & Seiple, W. (2016). The functional performance of the BrainPort V100 device in persons who are profoundly blind. *Journal of Visual Impairment & Blindness* (Online), 110(2), 77.

Metz, M. (2017) A Gold Standard. Hearing Health Matters

7.

Tactile sensations as the basis for the development of tactile language

– Our senses, their functions and importance

CAROLINE LINDSTRÖM

KEYWORDS: TACTILE SENSE, PROPRIOCEPTIVE SENSE, VESTIBULAR SENSE, SENSORY INTEGRATION

In order to develop tactile language together with people with congenital deafblindness, your own experience and knowledge of the tactile sense is needed. Seeing and hearing partners must try to move closer to the perceptual world of the person with congenital deafblindness. Therefore this chapter describes the meaning of the tactile sense - what it means and how it is related to other sensory functions that we use to develop a tactile language.

Introduction

The title of this book is If you can see it, you can support it. The title indicates that development of a tactile language presupposes that the partner has the ability to see expressions from persons with congenital deafblindness as communicative utterances. Many chapters in this book offers examples of how these utterances may appear in a bodily tactile modality as well as how the partner responds to these utterances in the communication. However, in order to develop tactile language together, as a partner one must first try to understand what it means to experience the world from a tactile perspective. In order to do so it requires both knowledge of, and own experiences of, the tactile sense. That means daring to move closer to the perceptual world of the person with congenital deafblindness and provide as good conditions as possible so one can make shared experiences and sensory impressions available – through

this we can develop languages together. Many people with congenital deafblindness also have residual hearing and/or vision that are important to consider in addition to the tactile sense. Through good stimulation of, and optimal conditions for the use of these senses, they also contribute to making the outside world accessible and thus interesting to engage in meaningful experiences. However, optimal conditions for the use of visual and hearing residues depend on factors such as the surrounding environment, the relationship, motivation, physical and mental conditions. This means that a functional use of vision and hearing can change from situation to situation for the person¹. There are also studies that indicate a difficulty in using both visual and hearing residues in a functional way if both senses are impaired, which leads to these senses often being used sporadically and one at a time². In order to compensate for loss in vision and hearing,

¹ Rødbroe & Janssen, 2008

² Danskt resurscenter för medfödd dövblindhet, 2004

³ Deafblind International, 2012

Experiences through the tactile sense³

- Use earplugs and a blindfold to experience what it could feel like having a combined vision and hearing loss.
- Experience the rain on your face as the water droplets trickle gently down on your eyelids, past the creases next to your nose, onto your lips and chin
- Explore the ocean, perhaps by sitting in it (even with your clothes on) and let the wet sand caress your hands
- Walk through a forest and really touch the plants and trees
- Explore your own face, your hands or your feet or even explore the face of another person
- Eat with someone and to feel their chin as the food is chewed, to explore their throat as the food is swallowed
- Bake a cake or knead some dough and feel all the textures and smells
- Feel the tingle on the palm of your hand just after someone else clapped your hand
- Sit very close to someone so that you can feel their breathing, touch their head with your head, entwine your arms.

the tactile sense cooperates with vision and hearing ability and is necessary for the experiences of having a meaningful context. This collaboration is part of what is called sensory integration and means that our brain receives and process sensory information so we can do and understand things in our everyday life. If we imagine that we are peeling an orange, we will sense the orange through the eyes, nose, mouth, the skin on our hands and fingers, as well as through muscles and joints. We then know that it is an orange because all sensory information is processed in our brain so that we know, for example, the colour, shape, texture and scent of an orange.⁴ The tactile sense is therefore important as a reliable basis for people with vision and/or hearing loss in order to create context and a whole for the person. When using the tactile sense, in combination with residual vision and hearing, communication is maintained, and it is therefore easier to achieve reciprocal communication through touch and movement from the partner.⁵ Offering sensory stimulation and communication based on the tactile sense, in combination with residual visual and hearing as well as smell and taste, therefore contributes to optimal opportunities and experiences for the person.

So, what is the tactile sense? What do we mean when we use that term and how can it be the basis for language development? Below is brief information and overview of our tactile sense as well as a brief introduction to language development based on a tactile modality.

The tactile sense

Today, there is a lot of research on vision and hearing to be found. However, there is less knowledge about the tactile sense. Nevertheless, one should not be misled and believe that the tactile sense is more primitive than vision and hearing, it is instead a complex perception system that develops before vision and hearing even during the foetal stage. Furthermore, touch is something that we all use in social situations and is extremely important for our survival as small babies.⁶ Today, however, the knowledge is rapidly increasing about this sense and the knowledge of how this system works and forms the basis for body image, imitation, empathy, pain and memory increases. Due to its complexity, tactile functions of persons with deafblindness should therefore be seen in relation to meaning making, cognitive functions, emotions and communication.⁷

Our tactile sense consists of a complex network of nerve threads and receptors on the skin and in muscles and joints. This network is called the somatosensory system and consists of different parts: pressure, vibration, touch, temperature, pain and various positions for joints and muscles. These different parts provide sensory stimuli, sensations, to the brain through various pathways in the spine. The receptors in the skin, joints and in the muscles sends different information to the brain based on the area that provides information.⁸ The collected information provides an understandable picture of everything the body comes into contact

with. This means that through the tactile sense, in combination with, for example the vestibular sense, sensations can be understood both as isolated phenomena but also how it interacts with our body and the world around.⁹ The following text gives an example of how sensations can be interpreted and understood based on the tactile sense: *"When holding a cup of hot coffee, the body senses when contact with the cup is made, it senses the shape and texture of the cup, the warmth of the coffee, the amount of coffee inside the cup, if the liquid is gently swirled, the weight of the cup, where the cup is in relation to the rest of our bodies, the amount of effort required to bring the cup to our mouths and so on. And at the same time, receptors are also providing information about whether we are sitting down, standing up or gently walking back to our chair, what surfaces we are in contact with, what the weather is like in terms of temperature, wind or precipitation and much more".*¹⁰ As the quote illustrates, our tactile sense is closely linked to the use of our joints and muscles and our balance. Below is brief information about these important sensory functions.

The proprioceptive sense

The proprioceptive sense includes our muscles and joints. This sense is easily forgotten when much focus is directed on our communicative senses (visual, hearing, tactile). However, proprioception has a necessary function as the foundation for the communicative senses.¹¹

Proprioception is a composition of two Latin words that means "an awareness of or a feeling of one's own body".¹² It means that the proprioception is the ability we have to feel where all body parts are in relation to each other without having to touch them. It helps us plan, place and control our movements without having to use our sight. The receptors for this sense are located in the muscles and in the joints throughout the whole body. They are activated when the muscles are stretched, as well as during contractions and bends so that we know where our body parts are in relation to the spatial room, whether they move or not, how quickly and in what direction. A temporary loss of proprioceptive perception can be experienced when a leg falls asleep due to prevented blood circulation in the leg and we cannot feel the leg or rely on it for support at all.¹³

The vestibular sense

Our vestibular sense is also called the vestibular system and is located in the inner ear where the receptors react to the force of gravity. This sense is unique as it gives us continuous information about how we and our surroundings interact and how we can orient ourselves. It helps us know what is up and down and discovering our movements. The vestibular sense cooperates closely with the tactile sense as well as the proprioceptive sense as it keeps track of our muscle activity and body posture and regulates this so that we can maintain a safe and functioning body position at all times, even when we move.¹⁴ Therefore, the vesti-

⁴ Ayres, 1988

⁵ Rødbroe & Janssen, 2008

⁶ Nicholas, 2010

⁷ I Fokus, 2018

⁸ Nicholas, 2010

⁹ Hart, 2010

¹⁰ Hart, 2010 p. 82

¹¹ Brown, 2013

¹² Brown, 2013 p.9

¹³ Brown, 2013

¹⁴ Brown, 2013

bular sense has significance for posture, balance and movement.¹⁵

The tactile sense and language development

Initially, our communicative senses were mentioned, the visual, hearing and tactile sense. For people with congenital deafblindness, the tactile sense is important for communication, but it also means that all the mentioned senses in this chapter are important in relation to tactile language development since tactile language is based on what the body can perceive and interpret, that is, our tactile sense, posture, movements as well as balance, in combination with residual visual/hearing. For a long time within the deafblind field knowledge of Bodily Emotional Traces, BETs, has been of great significance. This concept includes sensations that you receive in different ways through experiences, which creates bodily traces - what you remember of the sensation, that is, what was meaningful to you. It can be, for example, how something felt against your skin, a movement that you did in the activity or a feeling that lingers in the body. Then the person with congen-

ital deafblindness can comment on this memory by, for example, touching the place on the body where they felt something.¹⁶

Today, there is also research that shows that the brain has the ability to reorganise and develop areas.¹⁷ This means that the tactile area in the brain takes over when vision and hearing do not work fully. It is therefore legitimate to assume that people with congenital deafblindness have a greater ability to perceive and interpret information from the tactile sense than sighted/hearing persons have. This assumption forms the basis, among other things, of the concept of heightened tactile perception where utterances from persons with congenital deafblindness are based on a higher sensitivity to tactile stimuli in the exploration of objects.¹⁸

Our senses and the information these give us are seemingly very complex and the tactile sense can also form the basis for language development through linguistic elements in tactile language consisting of positions, touch, pressure, movements and muscle tension.¹⁹

¹⁵ Ayres, 1988

¹⁶ Janssen & Rødbroe, 2009

¹⁷ Nicholas, 2010

¹⁸ Forsgren, 2016

¹⁹ Dammeyer, et al., 2015

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References

Ayres, J. (1988). *Sinnenas samspel hos barn.* Psykologiförlaget: Stockholm.

Brown, D (2013). *Sinnenas samspel.* Artikelsamling utgiven av Specialpedagogiska skolmyndigheten.

Dammeyer, J., Nielsen, A., Ström, E., Hendar, O., Eiriksdottir, V.K (2015). A Case Study of Tactile Language and its Possible Structure: A Tentative Outline to Study Tactile Language Systems among Children with Congenital Deafblindness. *Journal of communication disorder, Deaf studies & hearing aids.* Vol 3:2.

Danskt resurscenter för medfödd dövblindhet (2004). *Kortlaegning af medfödt dövblindhed. En dansk populationsundersøgelse august 2000-December 2003.*

Videncenter för Dövblindfödde. Deafblind International (Dbi). (2012). *Landscape of touch.* Tactile Communication network. DVD.

Forsgren, G. (2016). The emerge of sign constructions based on heightened tactile perception. (Unpublished Master thesis) Netherlands, University of Groningen.

Hart, P (2010). *Moving beyond the common touchpoint. Discovering language with congenitally deafblind people.* (Doctor study). Scotland, University of Dundee.

Janssen, M., & Rødbroe, I. (2008). *Kommunikation och medfödd dövblindhet. Medfödd dövblindhet och principiella utgångspunkter för insatser.* Finspång: Mo Gårds förlag.

Janssen, M., & Rødbroe, I. (2009). *Kommunikation och medfödd dövblindhet. Kontakt & Socialt samspel.* Finspång: Mo Gårds förlag.

Mo Gård (2018). Känsln – vårt mest sociala sinne är viktigt för att utveckla empati. *I Fokus*, nr 13, Tema: Beröring.

Nicholas, J (2010). *From active touch to tactile communication - what's tactile cognition got to do with it?* The Danish Resource Centre on Congenital Deafblindness.

Thoughts on tactile languages

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KEYWORDS: TACTILE LANGUAGE, PHONOLOGY, MORPHOLOGY, PARAMETERS

This theoretical chapter focuses on tactile languages as natural languages, their phonology and morphology. It is argued that the whole body is equivalent to ears in spoken languages and eyes in signed languages; expressions from the body can be seen as equivalent to articulators in spoken and signed languages, whereas the touch (tactile) is paralleled by modality – compared to using the voice (spoken) or signs (signed). Tactile languages have seven parameters: touch, the whole body, non-manuals, handshape, movement, orientation and location, which combine in lexical entities called nemes comparable to words in spoken languages and signs in signed languages. The neme-morphemes can be produced both sequentially and simultaneously. For the time being they are described as free morphemes.

When it comes to communication with persons with deafblindness through use of a language with arbitrary signs through touch, one of the earliest sources is the ideas of Lorenzo Hervas y Panduro from 1795.¹ For Panduro, the tactile languages are equal to the spoken and signed languages, since the person with deafblindness perceives the language through the senses available to him or her. In a conversation between Peirce and a friend of his who had lost his hearing entirely, Peirce asked how it was possible to develop a new sense of perceiving the world through the whole body in just a few months.² His friend answered briefly by saying that he had always

“possessed this mode of consciousness”.³ The fact that bodily touch has been used in communication with individuals with deafblindness as a natural way of communication, in combination with the fact that we all have the mode of consciousness to perceive through our body, made me wonder if it could be argued that the whole body is an equivalent to ears in spoken languages and eyes in signed languages; if the body can be seen as equivalent to articulators in spoken and sign languages and the touch (tactile) as paralleled by modality ie voice (spoken) and signs (signed). This chapter is my attempt to contribute to the research on the structure of tactile languages. Due to

¹ Farrell, 1956

² Peirce, 1931-58

³ Peirce, 1931-58

the short format of this chapter and the diversity of my reflections, some thoughts are briefly mentioned, and the theory is presented briefly.

On neuroplasticity and the tactile modality

Two studies⁴⁵ have looked at cortical processing of tactile language.⁶ Obretenova and colleagues have examined a pre-lingual deaf and early blind subject, while Yasuhiro and colleagues have studied post lingual deafblind subjects. he results of both studies are similar: cortical regions implicated with language are activated while tactile language is used with the participants. Nicholas⁷ provides an overview of studies that have looked at how the brain processes information through touch. The findings of his research show evidence of tactile working memory in individuals with congenital deafblindness. You can read more about this in chapter 13.

On the grammar of tactile languages

Dammeyer et al⁸ have analysed tactile phonology, morphology and syntax as well as tactile sign language, "the space" of communication in the language of participants with congenital deafblindness. Their study is the first one in the field outlining a grammatical structure of tactile

languages. In his Master thesis, Forsgren⁹ summarizes six language categories found in tactile languages: signs from sign language, BETs, mimetic, hyper-tactile perception, idiosyncratic and pointings. Chapter 10 on tactile iconicity describes further the grammar of tactile languages.

There is research on tactile morphology in the language of persons with acquired deafblindness.^{10,11} The question which remains unanswered for the time being is how a language in the tactile modality used by persons with acquired deafblindness differs from a tactile language used by persons with congenital deafblindness.

Current contributions

This section starts with a discussion of the phenomena at the phonological level and ends with a discussion of the morpheme in the tactile languages.

On the phonology of tactile language

Tactile language utterances contain both touch, sounds, words, signs, finger-spelled words, BETs, mimetics, signs as perceived, hypertactile perception, ideosyncratic and pointing in different proportions.¹² Sounds, words, signs, pointings and finger-spelled words come from spoken and signed languages, which have

been shown to be natural languages. BETs, mimetics, signs as perceived, hypertactile perception, ideosyncratic and pointings show the nature of the utterance, and different tactile utterances can be grouped into different categories (cf. Peirce's categories¹³). suggest that the categories BETs, mimetics, signs as perceived, hypertactile perception, ideosyncratic and pointings be viewed as lexical open classes which have their place in a sentence. What remains uncategorised is the function of the whole body and touch. What are they? They are the lexical units specific to tactile language. I propose to use the Icelandic word *nema*¹⁴ to describe the equivalent to a word in spoken languages and a sign in signed languages as a term for the lexical units of the tactile languages.

In this part of the chapter I will try to describe the phonological structure of the *nema*. The description is based on the research of Stokoe¹⁵, Battison¹⁶, Liddell and Johnson¹⁷ for sign languages; Ask Larsen¹⁸, Dammeyer and Nielsen¹⁹ and Dammeyer and colleagues for tactile sign language²⁰ and my own research.

I also propose that the parameters of a *nema* are: touch, whole body, non-manuals, location, movement, handshape and orientation.

A *nema* can either consist of **only one parameter**: a touch, a non-manual or the whole body or be **a combination of parameters**: touch+non-manual, non-manual+non-manual, the whole body+non-manual or as for signs in sign languages: combination of location, movement, handshape, orientation and /or non-manuals.

The hold-movement theory applies to the tactile languages because signs from sign languages are part of the language but we need more research on how the hold-movement theory applies to the parameters of *nema*, such as touch, the whole body and movement of the leg.

The hold-movement theory²¹ applies to the tactile languages because signs from sign languages are part of the language but we need more research on how the hold-movement theory applies to the parameters of *nema*, such as touch, the whole body and movement of the leg.

On morphology of tactile language

A morpheme is the smallest meaningful unit in a language. Like spoken and signed languages, the tactile languages also have morphemes. The *nema*-morphemes can be both sequentially and simultaneously produced. A *nema*-morpheme is sequentially produced when it consists only of a sound (see non-manuals, sound in the table). A *nema*-morpheme is simul-

⁴ Obretenova, et al., 2010.

⁵ Yasuhiro, et al., 2004

⁶ In this chapter I use the concept tactile language to refer to the modality (spoken vs. signed). I choose not to use tactile sign language because the lexical unit in tactile language in my opinion is not a sign as the terminology is used for sign languages (Stokoe, 1960). If the term tactile sign language is used it gives the impression that this is a sign language used in the tactile modality.

⁷ Nicholas, 2013

⁸ Dammeyer, et al. 2015

⁹ Forsgren, 2016

¹⁰ Collins, 2004

¹¹ Raanes, 2006

¹² Dammeyer, et.al., 2015

¹³ Mladenov, 2006

¹⁴ This word was chosen because of its multiple meanings. It refers to distinguishing something from something else when used as adverbial; when used as a verb it refers to the process of acquiring (unconscious) and learning (conscious); the verb means also perceive.

¹⁵ Stokoe, 1960

¹⁶ Battison, 1978

¹⁷ Liddell & Johnson, 1989

¹⁸ Ask Larsen, 2003

¹⁹ Dammeyer & Nielsen, 2013

²⁰ Dammeyer, et al., 2015

²¹ Liddell & Johnson, 1989

Table 1

Parameter	Aspect	Description
TOUCH ²²	Location of the touch <i>Where is the body being touched?</i> <ul style="list-style-type: none">Head, upper trunk, hand, lower trunk, leg	For the time being see the descriptions for locations (below)
	Contacting parts <i>Which parts of the body touch each other?</i> <ul style="list-style-type: none">Hand touches head, upper trunk, hand, lower trunk, legFoot touches footCheek touches shoulderChin touches chest	Handshape types (see handshape) Orientation of the hand (see orientation) Orientation of the foot (see orientation)
	Muscle tension	Low, average, high
	Pressure	Soft, mild, hard, tight, tense
	Length	Short, long
THE WHOLE BODY	Posture of the body	Upright, tilt, bent
	Movement of the body	Jump, shake-like, rotate Stand on toes Rock from side to side or forwards and backwards
NON-MANUALS	Mouth patterns not related to the sound	Specific to each tactile language i.e. tongue out, air in the chin etc.
	Sound (consonants + vowels)	Single consonant combination of consonants Single vowel Two or more vowels One or more consonant + one or more vowel Word as interpreted by the person with CDB or conventional Part of word as interpreted by the person with CDB or conventional
	Posture of the head	Up, down, to the right, to the left, tilted, forward, backward
	Facial expression	Anger, disgust, embarrassment Fear, happiness, joy, sadness Surprise, interest

²² The touch is proposed to be a parameter in tactile language while in Stokoe's system, the touch is a phoneme of the parameter movement.

Parameter	Aspect	Description
HANDSHAPE ²³	Handshape type	Fist, flat hand, curved hand, retracted hand, F hand, index, H hand, pinkie or I hand, K hand, L hand, bent hand, R hand, V hand, W hand, Y hand
	(finger group complexity)	To be researched if relevant for tactile language
LOCATION ²⁴	Head	Forehead, eye, ear, chin, nose, mouth, cheek, eyebrow, face
	Upper trunk	Throat, chest, neck, back, shoulder
	Arm and hand	Upper arm, elbow, wrist, palm of the hand, back of the hand, finger, edge of the palm
	Lower trunk	Waist, hip, abdomen, waist
	Leg	Upper leg
	Free space	In front of the head, in front of the body
MOVEMENT ²⁵	of the arm ²⁶ Vertical motion Lateral motion To and from motion Twisting motion Carpal motion (bending at wrist) Foral motion (opening/closing of a handshape) Approach Graze Link Enter Cross Separate Interchange	Upward, downward, up and down Rightward, leftward, right and left
	of the leg Vertical motion Lateral motion To and from motion	Upward, downward, up and down Rightward, leftward, right and left Bend knee
ORIENTATION	Hand	Up/down; right/left; to and away
	Leg	Toes face up, toes face down Toes face to the right

²³ As described by Stokoe (1960) the handshapes may differ from one tactile language to other.
²⁴ As described by Stokoe, 1960
²⁵ As described by Stokoe, 1960 with some additions from the author
²⁶ As described by Stokoe, 1960

taneously produced when more than one aspect is used at the same time.

I suggest for the time being that the morphemes of the tactile languages are free. They can stand alone, have their specific meaning and function as words in spoken languages and signs in signed languages. Forsgren²⁷ talks about six language categories and they can be seen as free morphemes.

It is not unthinkable that tactile languages have bound morphemes with their roots in sign languages, such as inflectional morphemes for tense and aspect and numeral incorporation, but also bound morphemes which have their roots in spoken languages. From the research of the language of people with

acquired deafblindness we know that there are ways to talk about singular and plural.²⁸ The task for future research is to map the morphemes and find out if there are specific bound morphemes for tactile languages.

Conclusion

The tactile languages are natural languages because research has shown that areas in the brain associated with language become active when tactile stimulation is used and also because the tactile languages have their own grammar. The lexical unit of the tactile languages is nema and by using them people with congenital deafblindness can communicate their thoughts, or in the words of Peirce, language is the metonym of thought²⁹, regardless of the modality.

²⁷ Forsgren, 2016

²⁸ Collings, 2004

²⁹ Mladenov, 2006

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References

Ask Larsen, F. (2003). *The Washing-Smooth Hole-Fish and other findings of semantic potential and negotiation strategies in conversation with congenitally deafblind children* (Unpublished Master thesis). Aarhus: University of Aarhus.

Battison, R. (1978). *Lexical Borrowing in American Sign Languages*. Silver Spring, MD: Linstok Press.

Collins, S. (2004). *Adverbial Morphemes in tactile American sign language*. Doktorsavhandling, Graduate College of Union Institute and University, Cincinnati, OH.

Dammeyer, J. & Nielsen, A. (2013). Døvblindfødte personers sproglige udvikling: om muligheder og umuligheder for taktilsproglig udvikling hos personer med medfødt døvblindhed. In J. Dammeyer og A. Nielsen (ed.), *Kropslig og taktil sprogudvikling. En antologi om forskellige sprogmodaliteters muligheder og umuligheder, undersøgt med afsæt i personer med medfødt døvblindhed* (pp. 81- 90). Aalborg: Materialecentret.

Dammeyer, J., Nielsen, A., Strøm, E., Hendar, O., Eiriksdottir, V.K. (2015). A Case Study of Tactile Language and its Possible Structure: A Tentative Outline to Study Tactile Language Systems among Children with Congenital Deafblindness. *Journal of Communication Disorders, Deaf Studies & Hearing Aids*, 3: 133.

Farrell, G. (1956). *Children of the silent night: The story of the education of deaf-blind children here and abroad*. Watertown, MA: Perkins school for the Blind.

Forsgren, G.A.G.C. (2016). The Emergence of Sign Constructions Based on Heightened Tactile Perception. The Proposition of a New Sign Category. (Unpublished Master thesis) Groningen: University of Groningen.

Liddell, S. K. & Johnson, R. E. (1989). American Sign Language: the phonological base. *Sign Language Studies*, 64, pp. 195-278.

Mladenov, I. (2006). *Conceptualizing Metaphors: On Charles Peirce's Marginalia*. Oxford and New York: Routledge.

Nicholas, J. (2013). Tactile cognition and tactile language acquisition - an information processing approach. I S. Køppe, J. Dammeyer og A. Nielsen (ed.), *Kropslig og taktil sprogudvikling. En antologi om forskellige sprogmodaliteters muligheder og umuligheder, undersøgt med afsæt i personer med medfødt døvblindhed* (pp. 47-79). Aalborg: Materialecenteret.

Obretenova S., Halko M. A., Plow E. B., Pascual-Leone A. & Merabet L. B. (2010). Neuroplasticity associated with tactile language communication in a deaf-blind subject. *Frontiers in Human Neuroscience* 3, 60.

Peirce, C. S. (1931-58). *Collected Papers of Charles Sanders Peirce*. 8 vols. Vols. 1-6 ed. by C. Hartshorne & P. Weiss (1931-35), vols. 7-8 ed. by A.W. Burks (1958). Cambridge, MA: Harvard University Press. (Citerat sp, CP, hänvisningar till volymnummer och stycke, inte sidor).

Raanes, E. (2006). Å gripe inntrykk og uttrykk. *Interaksjon og meningsdanning i døvblindes samtaler*. Doktorsavhandling, NTNU, Trondheim, Norge.

Stokoe, W. (1960). Sign language structure: an outline of the visual communication system of the American Deaf. *Studies in Linguistics Occasional Paper* 8. University of Buffalo.

Yasuhiro, O., Katsumi, D., Masashi, T., Kazuhiro, N., Hiroshi, N., Aya, I., Takako, I., Masao, I., Takuya, Y., Naohiko, O., Jun, H., & Takeshi, K. (2004). Cortical processing of tactile language in a postlingually deaf-blind subject. *NeuroReport*, 15(2), 287-291.

Languaging between a child with congenital deafblindness and a bimodal, bilingual teacher

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KEYWORDS: LANGUAGING, TRANSLANGUAGING, LINGUISTIC DESIGN, LINGUISTIC EXPOSURE, BIMODAL BILINGUALITY

Most people with congenital deafblindness do not develop language as it is spoken in the surrounding culture, only a certain degree of symbolic language. The reasons for this are many and complex. Lack of access to cultural language because of reduced vision and hearing is often identified as one of the main challenges¹. This chapter is based on the author's experiences of speaking with persons with congenital deafblindness. I describe myself as *the teacher*.

What people do when they speak together can be called *languaging*. This chapter is about how an inclusive perspective on language opens for languaging that uses several languages at once. In linguistic theory, this is called *translanguaging*. The languaging to which I refer appears different from typical languaging because it has its starting point in the bodily tactile expressions of the deafblind person and combines these with elements from Norwegian Sign Language and spoken Norwegian; it occurs in connection with language development and is not connected to second language learning. The intention of this chapter is to refer to how we as partners, through languaging with the deafblind person, can facilitate exposure to language. My point is that exposure to language can be designed to have an intrinsic grammatical structure that can be perceived by the deafblind person and stimulate language growth.

¹ Ask Larsen, 2016; Nafstad & Rødbroe, 2015; Souriau, Rødbroe & Janssen, 2009; Vervloed & Damen, 2016

Introduction

As a teacher in a conversation with a student with congenital deafblindness, I often find that there is flow and that we are both actively participating. Many people would describe this interaction as communication. I describe the conversation as *linguaging*² because the student and I are expressing cognitively complex ideas through use of language. The term *linguaging* also indicates that I perceive the expressions the student makes as language. I will return to this.

I have found myself relating linguaging to the experiences I have had with my own children from when they were new-borns in the period before they had begun to speak. Viewed from a language development perspective, my children were at a prelinguistic stage, not unlike the linguistic developmental stage of my deafblind conversation partners. Nonetheless, we never spoke about our children as not having language. We used the word speak. When we responded to the facial expressions and sounds of the baby, we described this as speaking together even though it was me as mama who was responsible for most of the speaking. I could answer (reciprocate) the babbling of the baby by smiling and saying, "'BABA' you say! 'BABAAA'...!". Even though the baby and I did not have the same size of linguistic repertoire we were both language users. Just as I led linguaging with my children, the linguaging I refer to here is mainly teacher-led.³

One of the intentions behind the linguaging the deafblind person and I have together is providing access to cultural-linguistic elements with intrinsic grammatical structures which can again promote growth of language resources with which the deafblind person can express herself later. Viewed from a perspective on early language development, the expressions of the deafblind person in a communication situation can be compared with the very first words uttered by small children⁴ in the sense that their communicative intention can be equated with that of the complete phrases and sentences of the adult.⁵

Language

It can appear obvious what language is – we use it every day after all – however the topics of language and language development continue to have high relevance. Saussure is thought to be the father of linguistics and 100 years ago, he distinguished between *langue* and *parole*.⁶ La langue means *language* as a system, while la parole is *to speak*. As "language is found in all human cultures, and is woven into all human activity", it is not so strange that academic disciplines such as psychology, pedagogy and social anthropology, not merely linguistics, deal with language. Funnily enough, it is seldom defined and if so, emphasis is usually laid on language as system.⁷

Among the languages of the world most are spoken and have an oral-auditive modality. If we separate perception of

Figure 1 Linguistic modalities can categorise cultural language

Cultural language	Norwegian spoken language	Oral auditive modality
Cultural language	Norwegian sign language	Gestural visual modality
	Tactile language? – a theoretical construct. Often referred to and conceived as a congenital deafblindness-specific language	Bodily tactile modality

language and production of language, we can say that spoken language has two modalities, one for understanding and one for communication.⁸ When we perceive language with our hearing, we say that the *impressive language* has an auditive modality. When we express ourselves vocally by using organs of speech this is *expressive language* in an oral modality. The combination of modality oral-auditive in this way can categorise spoken language.⁹ In a similar way, we categorise other languages by naming the modality combinations for understanding and communication, see figure 1.

Different theories reflect different perspectives on language. To put *linguaging* into a theoretical context, two

contrasting theories are presented next.

Traditional language theory

When we decide how much language a child knows we compare as a rule the language of the child with that used in the surrounding culture. Specific languages such as Norwegian, English and Norwegian Sign Language are examples of conventional socio-cultural languages, also described as formal abstract systems. The language is a standard to which we refer and with which we compare. In traditional linguistic theory, language is an object of learning. In this perspective, linguistic knowledge depends mainly on how much the child knows of vocabulary and grammar.¹⁰ When the language development of people with

Figure 2 Traditional language theory



² Swain, 2006
³ Swanwick, 2017
⁴ Nafstad & Rødbye, 2015
⁵ Evans, 2014
⁶ Martinsen, 2018
⁷ Von Tetzchner, Feilberg, Hagtvet, Martinsen, Simonsen and Smith, 1993 p. 14

⁸ Jepsen, De Clerc, Lutalo-Kiingi & McGregor, 2015
⁹ Fusellier-Souza, 2006; Kusters, 2017
¹⁰ Dufva, 2013

congenital deafblindness is assessed as having a certain level of symbolic language but seldom spoken language or sign language skills¹¹, these are conclusions based on comparisons of the linguistic competence of the deafblind person with age adequate standards of spoken or signed languages. In this perspective, language can be assessed as being at different stages of linguistic development and can be described as 'pre-linguistic' and 'age-adequate', 'deficient', 'correct' and 'wrong'. In this theory of language, gestures, mimicry and body language are not considered to be language, but rather categorised as non-verbal communication.¹² It is the named languages we have learned at school – that we had as foreign languages – and are used to thinking of as language that are languages; however, from a linguistic standpoint, these are artificially bounded by national orders, ethnic groups and based on social concerns.¹³ Named language is defined politically and socio-culturally.

Translanguaging

Translanguaging is language theory that states that named languages cannot be defined linguistically, and this breaks with the idea that language is a formal, abstract system.¹⁴ Translanguaging is radically distinct from traditional language theory. The Russian philoso-

pher of language, Bakhtin¹⁵ points out that language does not exist as something neutral and impersonal – children do not learn language by memorising the dictionary! Children learn language through communication face-to-face¹⁶, through *la parole*, and it is well-known that languaging and children's engagement in languaging¹⁷, are important prerequisites for language to develop.¹⁸ Languaging as an activity implies in fact that the child has a language to language with. The findings of typical language development make probable that also the deafblind child profits from languaging.

«Translanguaging is the deployment of a speaker's full linguistic repertoire without regard for watchful adherence to the socially and politically defined boundaries of named (and usually national and state) languages». ¹⁹ Linguistic analysis of the spontaneous languaging of humans is the analysis of our inner grammar, our set of lexical and structural elements.²⁰ From a translanguaging perspective, human languaging is natural, real and authentic. That which supports meaning creation, whether gestures, mimicry, body language, gaze or reference to an object comprise part of the linguistic repertoire. Translanguaging is liberating because it regards the whole of the linguistic repertoire of the one speaking as *language*.²¹ It

recognises that the meaning construction of humans can come to expression in many ways. We all have our unique ways of doing this. The study of the speaker's linguistic repertoire is the study of the person's *idiolect*.²² This term was introduced by the German linguist Hermann Paul in 1888.²³ Each person has their idiolect, a personal language with a mental grammar.²⁴ Idiolect is language such as it appears from the inner perspective of the person.²⁵ Let us look at the personal language of the person with deafblindness.

The idiolect of the deafblind person

The literature of the deafblind field suggests that the natural language of the deafblind person is created to a large extent against the background of experience-based, spontaneous gestures, so-called *bodily tactile expressions*.²⁶ A more complete description of bodily tactile expressions can be found in the book "Communicative relations" by Anne Nafstad and Inger Rødbroe (2015). We can briefly summarize that bodily tactile expressions can be body attitude²⁷, mimetic, iconic and

deictic (pointing) gestures and bodily movements, patterns of movement²⁸, HTP signs²⁹ and vocalisations. HTP signs are sign constructions based on physical exploration of the form and function of the object, as well as cognitive processing of what is explored.³⁰ You can see examples of this in chapter 10 about tactile iconicity. Viewed from the inner perspective of the deafblind person, these expressions and eventual other signs can, for example, be negotiated, or become conventional signs comprising the expressive language of the child. The bodily tactile expressions often have low readability³¹, something that makes the idiolect difficult to access for others. Impressive language is what the deafblind person receives from their interaction with the world. Besides residual hearing and vision function, perception can occur tactilely³², through the proprioceptive (muscles and joints) modality³³ and through the kinetic (movement) modality³⁴. The auditive repertoire will probably be strengthened if the child receives tactile support.³⁵ In typical language development, understanding is greater than the ability to express oneself.³⁶

The idiolect of the deafblind person

¹¹ Ask Larsen, 2016

¹² Vigliocco, Perniss & Vinson, 2014

¹³ Otheguy, et al., 2015

¹⁴ Kusters, et al., 2017; Otheguy, et al., 2015

¹⁵ Bakhtin, 1981

¹⁶ Vigliocco, et al., 2014

¹⁷ Laake & Bridgett, 2018

¹⁸ Bruner, 1983; Dufva, 2011; Laake & Bridgett, 2018; Tomasello, 2003; Laake & Bridgett, 2018

¹⁹ Otheguy, et al., 2015 p. 281

²⁰ Otheguy, et al., 2015

²¹ Otheguy, et al., 2015

²² Kuhl, 2003, Otheguy, et al., 2015

²³ Kuhl, 2003

²⁴ Otheguy, et al., 2015

²⁵ Otheguy, et al., 2015

²⁶ Nafstad & Rødbroe, 2015; Souriau, Rødbroe & Janssen, 2009

²⁷ Nafstad, 2018

²⁸ Nafstad, 2018

²⁹ Forsgren, 2016

³⁰ Forsgren, 2016

³¹ Ask Larsen, 2016; Nafstad & Rødbroe, 2015

³² Lindström, 2017

³³ Buelund Selling, 2013

³⁴ Buelund Selling, 2013

³⁵ Lindström, 2017; Nafstad & Rødbroe, 2015

³⁶ Burling, 2007

The circles used here and further on illustrate the idiolect of the person but do not reflect the size of the linguistic repertoire.

The linguistic repertoire of the teacher in languaging

The teacher is seeing, hearing and bimodally bilingual. Bilingual means that the person has competence in different

The idiolect of the teacher

languages; bimodal means that these two languages, sign language and Norwegian spoken language, are expressed in different ways, through different modalities. The idiolect of the teacher is the structural elements along with all the words and signs she knows. The linguistic repertoire of the teacher contains many elements from Norwegian spoken language and Norwegian Sign Language.

The language experience of the teacher is multimodal and includes tactile sign language communication derived from interpreting for people with acquired deafblindness. Experience from languaging in the tactile modality is part of the idiolectic repertoire of the teacher and there is reason to believe that this, in combination with bimodal bilinguality, influences her capacity for critical reflection during

languaging: deciding when and where, in relation to topic and context, which words/signs can be used, and which active senses the one she is speaking with can use for both language understanding (the impressive language of the deaf-blind person) and language production (the expressive language of the deafblind person).

Languaging

I assume that one prerequisite for languaging is that the people are together in a conversation. A conversation involves both partners directing attention toward one another in addition to their having shared attention toward both what they are talking about (the theme) and how they are doing this (the form).³⁷ In terms of environmental relations, conversations face-to-face are described as the most complex.³⁸

The disability of congenital deafblindness encompasses a heterogeneous population. Based on functional vision and hearing, the group can be divided into four subgroups³⁹, see figure 3.

The chapter focuses on conversations with a student with congenital blindness

Figure 3 Subgroups of the population of persons with congenital deafblindness

Subgroup 1 – individuals with congenital blindness and moderate hearing
Subgroup 2 – individuals with congenital deafness and moderate vision
Subgroup 3 – individuals with moderate vision and moderate hearing
Subgroup 4 – individuals with congenital deafness and blindness

³⁷ Nafstad & Rødbroe, 2015
³⁸ Nafstad & Rødbroe, 2015
³⁹ Fellingner, Holzinger, Dirmhirn, van Dijk & Goldberg, 2009

Figure 4 Language development from a translanguaging perspective



and moderate hearing (subgroup 1). Two typical characteristics of communication with this subgroup is that they often use more than one system to communicate, hearing to understand, signs to express themselves.⁴⁰ Despite their being exposed to spoken language, vocal expressive language does not develop.⁴¹ This group also appears to have a modality combination that diverges from what we find in cultural language such as spoken language and sign language. It is neither purely oral-auditive nor gestural-visual. The advantage of translanguaging is that it does not need to be either-or.

It is important to be aware that there is a relation between language exposure and

the expressive language under development. An array of studies show that the order linguistic structures appear in the expressive language of the child strongly correlates with the structures in the language to which they are exposed.⁴²

It is therefore improbable that expressive sign-based language will grow if the deafblind person is exposed to vocal language.

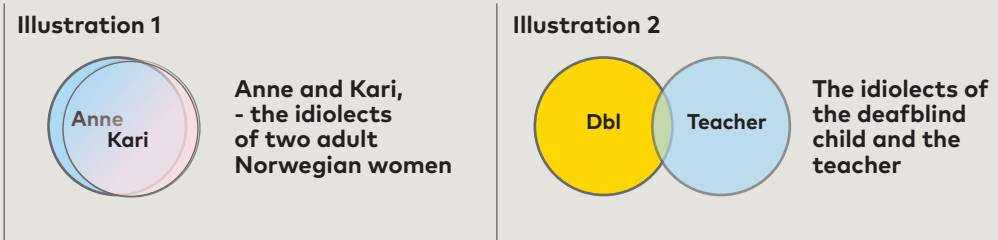
As a teacher, I strive to design language exposure in which the grammatical structure both can be perceived by the deaf-blind child and used by the child to express himself at a later point (when the idiolect has grown). If this is to occur with

Figure 5 Examples of language mixtures that are faithful to semantics in both languages

Norwegian spoken language	Today, you and me are together
Norwegian Sign Language	TODAY, YOU ME TOGETHER
TIME	—————→
Norwegian spoken language	You say 'APPLE', you think about what?
Norwegian Sign Language	YOU SIGN 'APPLE', YOU THINK WHAT
TIME	—————→
Norwegian spoken language	Today we two are going to the woods for a walk. It will be fun!
Norwegian Sign Language	TODAY-WE-TWO IN WOODS, GO WALK. FUN

⁴⁰ Souriau, 2009
⁴¹ Nafstad & Rødbroe, 2015
⁴² Kania, 2013

Figure 6 Examples of the degree of overlap between two idiolects



the deafblind within subgroup 1, I believe that the exposure must include sign language elements, and preferably in combination with sound/voice. How can this be done? My finding is that this can occur through languaging that has its starting point in bodily tactile expressions and combines them with elements from Norwegian spoken language and Norwegian Sign language. Studies of bimodal bilingual use of spoken language and sign language show that language mixtures occur frequently⁴³ and the mixtures can be faithful to semantics (meaning content) in both languages. See examples in figure 5.

The Norwegian words in the example in figure 5 that do not have corresponding manual signs are so-called functional words. Functional words are small grammatical words⁴⁴ and are not necessary if the structure (the grammar) between the symbols (the words/signs) is expressed in other ways, for example by using sign language syntax. A typical characteristic of sign language is that time is often given first. When the time is given it is not necessary to conjugate verbs.

In conversations in which we understand one another, the idiolects of the conversation partners have a large degree of overlap, see Figure 6. illustration 1. If Kari, Anne and I were to meet, we would probably not think that we each have our own idiolect. Because our idiolects overlap so much, we think of them as the same language. From a sociocultural perspective, we speak the same language, but linguistically they are not completely identical. The theory of the idiolect forms the cornerstone of translanguaging as linguistic theory. If we meet other people from another linguistic culture, the idiolects will be more different and have fewer overlaps – and we will struggle to understand one another.

Therefore, let us return to the idiolects of the teacher and the student with deafblindness. Our encounters are meetings between two idiolects with areas of overlap; see figure 2, illustration 2. If the idiolects do not have contact, it will be difficult for the parties to talk to one another. The teacher must grasp the bodily tactile expression, and as soon as she

reciprocates (mirrors/copies) this, the idiolects can have contact and a degree of overlap. Meaning creation requires that the conversation partners do what they can to adapt to one another's idiolects. The idiolects are strengthened through languaging with regard both to lexicon (words/signs/symbols) and structure (grammar). For persons with congenital deafblindness, languaging based on the bodily tactile modality and use of the vocal-auditive and gestural-visual modality will make access to conventional language elements possible.⁴⁵

Conclusion

Viewed from a conventional language-theoretical perspective, it is not surprising that the linguistic competence of the deafblind person appears poor. In this perspective as well, it is not their linguistic competence that is tested but rather their ability to recognise named languages and adapt and use their idiolects in accordance with the named language.⁴⁶ If I again assess the linguistic competence of my own children now and then between 0 to 2 years of age, my conclusions would probably not be so far from those drawn about persons with congenital deafblindness – that the baby has a certain degree of symbolic language, but seldom shows spoken or sign language skills.

From a translanguaging perspective, persons with congenital deafblindness have language with which they language. The conditions for their language lie in the ability of their environment to speak with them. Languaging is dependent on the ability of the partner to see and answer expressions. Languaging based

“ We have seen that impressive language is stronger than expressive language. This is probably a great resource in a languaging context. ”

on the bodily tactile modality that also draws in oral-auditive (speech) and gestural (sign)-tactile modalities can expose the deafblind person to cultural linguistic elements (sub-group 1). Through such languaging, both the teacher's and the deafblind person's idiolects will be strengthened and the areas in which the idiolects overlap will become greater.

From a translanguaging perspective, language development in persons with congenital deafblindness will largely follow processes we know from theories of language development. We have seen that impressive language is stronger than expressive language. This is probably a great resource in a languaging context. The deafblind person has the role of 'one who speaks' and their bodily tactile expressions are recognised as linguistic.

The type of languaging referred to here, from a linguistic perspective, is explored empirically in the Master thesis, "An access to cultural language out of the ordinary. Linguistic perspective on languaging with a child with congenital deafblindness" from the University of Groningen (2018).

⁴³ Baker & van den Bogaerde, 2014; De Quadros, Lillo-Martin & Pichler, 2015; Emmorey, Borinstein, Thompson & Gollan, 2008
⁴⁴ Iversen, Otnes & Solem, 2007

⁴⁵ Kuhl, 2003; Otheguy et al., 2015
⁴⁶ Otheguy et al., 2015

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References

Ask Larsen, F. (2016). *Congenital deafblindness and bodily tactile language acquisition*. (Ph.D. study) Fredriksberg: University of Copenhagen

Baker, A. & van den Bogaerde, B. (2014). KODAs: A special form of bilingualism. In: Quinto-Pozos, D. (Ed.), *Multilingual aspects of signed language communication and disorder* (p. 211-234). Bristol, UK: Multilingual Matters

Bakhtin, M. M. (1981). *The dialogic imagination. Four essays* by M. M. Bakhtin. Trans. C. Emerson & M. Holquist. Austin, TX: University of Texas Press.

Bruner, J. (1983). *Child's Talk. Learning to use language*. London: Oxford University Press

Buelund Selling, H. (2013). Taktilkommunikation er mere end tegnsprog hånd over hånd. In Dammeye & Nielsen. *Kropslig og taktil sprogutvikling*. Aalborg: Materialecenteret.

Burling, R. (2007). *The talking ape. How language evolved*. New York: Oxford University Press.

De Quadros, R. M., Lillo-Martin, D. & Pichler, D. C. (2015). Bimodal bilingualism: Sign Language and Spoken Language. In: Marschark, M. & Spencer, P. E. (Eds.) *The Oxford Handbook of Deaf Studies in Language*. Oxford: Oxford University Press.

Dufva, H., Suni, M., Aro, M. & Salo, O.-P. (2011). Languages as objects of learning: language learning as a case of multilingualism. *Journal of Applied Language Studies Vol. 5*, 2011, 109-124

Dufva, H. (2013). Language learning as dialogue and participation. In: Christiansen, C., Kuure, L., Morch, A. & Lindström, B. (Eds.), *Problem-based learning for the 21st century* (pp. 51-72). Aalborg: Aalborg University Press.

Emmorey, K., Borinstein, H. B., Thompson, R. & Gollan, T. H. (2008). Bimodal bilingualism. *Bilingualism: Language and Cognition 11* (1), 2008, 43-61

Evans, V. (2014). *The language Myth. Why language is not an instinct*. Cambridge: Cambridge University Press

Fellinger, J., Holzinger, D., Dirmhirn, A., van Dijk, J. & Goldberg, D. (2009). Failure to detect deaf-blindness in a population of people with intellectual disability. *Journal of Intellectual Disability Research*. Volume 53, part 10, pp. 874-881

Forsgren, G. (2016). *The Emergence of Sign Constructions Based on Heightened Tactile Perception. The proposition of a New Sign Category*. (Unpublished Master thesis). Groningen: University of Groningen

Fusellier-Souza, I. (2006). Emergence and development of signed languages: From a semiogenetic point of view. *Sign Language Studies*, 7, 30-56.

Iversen, H. M., Otnes, H. & Solem, M. S. (2007). *Grammatikken i bruk*. Oslo: Cappelen Forlag AS

Jebsen, J. B., De Clerck, G., Lutalo-Kiingi, S., & McGregor, W. B. (2015). *Sign Languages of the World: A Comparative Handbook*. Berlin/Boston and Ishara Press, Preston, UK: Walter de Gruyter

Kania, U. (2013). 'Can I ask you something?': The influence of functional factors in the L1-acquisition of yes-no questions in English. *Yearbook of the German Cognitive Linguistics Association*, Volume 1, Issue 1, pp. 109-128.

Kuhl, Joseph. W. (2003). The Idiolect, chaos, and language custom far from equilibrium: Conversations in Morocco. Dissertation. Athens: University of Georgia (US).

Kusters, A. (2017). Gesture-based customer interactions: deaf and hearing Mumbaikars' multimodal and metrolingual practices. *International Journal of Multilingualism*, 14:3, 283-302, DOI: 10.1080/14790718.2017.1315811

Kusters, A., Spotti, M., Swanwick, R. & Tapio, E. (2017). Beyond languages, beyond modalities: transforming the study of semiotic repertoires. *International Journal of Multilingualism* 14:3, 219-232,

Laake, L. M. & Bridgett, D. J. (2018). Early Language Development in Context: Interactions Between Infant Temperament and Parenting Characteristics. *Early Education and Development*

Lindström, C. (2017). Contributing to a Bodily Tactile Language by Transforming Cultural Customs. A Case Study of Partner's Communicative Accommodations in Socialized Praxis based on a Bodily Tactile Modality and its Influences on a Bodily Tactile culture. (Unpublished Master thesis). Groningen: University of Groningen

Martinsen, H. (2018). Skjebnesvangre feiltakelser i klinisk arbeid og utviklingsmessig forskning. In: Martinsen, H., Røysamb, E. & Stadskleiv, K. (Eds.). *På enhver mulig måte – perspektiver på typisk og atypisk utvikling av kommunikasjon og språk*. Oslo: Universitet i Oslo

Nafstad, A., & Rødbroe, I. (2015). *Communicative relations*. Aalborg: Materialecentret

Nafstad, A. (2018). The authentic communication of the congenitally deaf-blind. In: Martinsen, H., Røysamb, E. & Stadskleiv, K. (Eds.). *På enhver mulig måte – perspektiver på typisk og atypisk utvikling av kommunikasjon og språk*. Oslo: Universitet i Oslo

Otheguy, R., García, O. & Reid, W. (2015). Clarifying translanguaging and deconstructing named languages: A perspective from linguistics. *Applied Linguistics Review*, 6(3), 281-307. Doi: 10.1515/applirev-2015-0014.

Souriau, J. (2009). Constructing a language: a co-authored adventure. In: Souriau, J., Rødbroe, I. & Janssen, M. (Eds.), (2009). *Communication and congenital deafblindness. Transition to the Cultural Language*. Materialecentret, Aalborg. Available from www.kentalis.nl and www.perkins.org

Souriau, J., Rødbroe, I. & Janssen, M. (Eds.), (2009). *Communication and congenital deafblindness. Transition to the Cultural Language*. Materialecentret, Aalborg. Available from www.kentalis.nl and www.perkins.org

Swain, M. (2006). Languaging, agency and collaboration in advanced second language Proficiency. In: Byrnes, H. Ed. *Advanced language learning: The Contribution of Halliday and Vygotsky*. London: Continuum.

Swanwick, R. (2017). Translanguaging, learning and teaching in deaf education. *International Journal of Multilingualism* 14:3, 233-249, Doi: 10.1080/14790718.2017.1315808

Von Tetzchner, S., Feilberg, J., Hagtvedt, B., Martinsen, H., Mjaavatn, P. E., Simonsen, H. G. & Smith, L. (1993). *Barns språk*. Oslo: Gyldendal Norsk Forlag AS

Tomasello, M. (2003). Constructing a language. A usage based theory of language acquisition. Boston: Harvard University Press.

Vervloed, M. P. J. & Damen, S. (2016). Language and Communication in People Who Are Deafblind. In: Marschark, M. & Spencer, P. E. (Eds.) *The Oxford Handbook of Deaf Studies in Language*. Oxford: Oxford University Press.

Vigliocco, G., Perniss, P. & Vinson, D. (2014). Language as a multimodal phenomenon: implications for language learning, processing and evolution. *Phil. Trans. R. Soc. B* 369, 20130292.

Tactile iconicity used in sign constructions by persons with congenital deafblindness

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KEYWORDS: TACTILE ICONICITY, SIGN-CONSTRUCTIONS, EXPLORATION, READABILITY

Linguistic expressions produced by persons with congenital deafblindness are often based on how they try to reproduce embodied-tactile impressions of their interaction with the world. Some of the expressions or the sign constructions take on the form of what I describe here as tactile iconicity. This means that one can locate cues from looking at how objects are explored by the person with congenital deafblindness and further find these cues in the sign constructions.

This chapter will look more closely at and describe the tactile iconicity which occurs in sign constructions. The goal of the chapter is to increase the readability of the expressions made by showing how sign constructions can occur.

Persons with congenital deafblindness produce language in a way that is different from that of seeing and hearing persons. This is because their expressions are mainly based on the impressions sensed through the body and hands. Persons with congenital deafblindness explore and experience the world mainly through the bodily tactile modality.^{1,2} We explain this by saying that an impression makes an imprint that can become an expression. An example of this can be found in greeting rituals. If one has a recurring greeting ritual where one always touches the cheek of the person with deafblindness when greeting her or him, this will be considered an impression that makes a bodily tactile trace or an imprint. This can be expressed by touching or pointing to the place (i.e. the cheek). The interpretation can be that he or she is referring to the situation or to the person regarding the greeting ritual. A possible meaning of the expression based on this reading can be: "It is you who greets me this way" or the expression can be a name-sign for the person greeting the person with congenital deafblindness. Linguistically one can expand the meaning of the interpretation. If the person who performs the specific greeting ritual is not present when the sign towards the cheek is made, then the interpretation can be that the expression is either a question, such as asking where this person is, or an expression of the thinking of the person performing the greeting ritual. These forms of sign constructions are known as BETs (bodily emotional traces).^{3,4}

It can be difficult to recognise and interpret expressions arising from the bodily tactile modality when comparing these to our own understanding of cultural language, either spoken or signed. The expressions have low readability⁵ and their linguistic potential is either ignored or discarded. Looking closer at what is happening, we often see that the activity the person with congenital deafblindness engages in is often of a linguistic character. In this case, the effect of the activity is that of showing what the person is thinking of or focusing on, here and now, making this a linguistic activity. When looking into this form of linguistic activity and at the expressions made, we find many elements related to conventional sign language.

Sign Language and Sign Constructions

Sign language is a visual iconic language. This means that many signs originate in visually perceived images that have been translated into signs. An example of this is the Norwegian sign for cup. When we look at a cup, we can see that it has a flat bottom, a cylindrical form and often a handle. This image can be translated into doable handshapes representing the cup, thus constructing the sign CUP. This is what we call a visual iconic sign. The process of how iconic signs are constructed involves image selection, schematisation and encoding.⁶

- **Image selection:** deciding which visual image/impression is going to

¹Nafstad & Rødbroe, 2015

²Nafstad, 2018

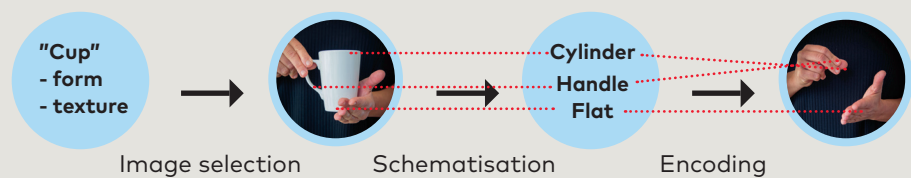
³Daelman, Janssen, Ask Larsen, Nafstad, Rødbroe, Souriau & Visser, 2004

⁴Vege, Bjartvik Frantzen & Nafstad A, 2004

⁵Nafstad & Rødbroe, 2015

⁶Taub, 2001

Figure 1 The process of sign construction: How an iconic sign is created in visual modality



- become a sign and which parts are to be translated;
- **Schematisation:** deciding which parts of the chosen image are possible to represent by handshapes and what do we choose among them;
 - **Encoding:** choosing handshapes and hand orientations representing the different parts of what is to be translated into a sign. It is important that all the parts preserve the overall structure of the original image chosen during image selection.

This process is illustrated in figure 1.

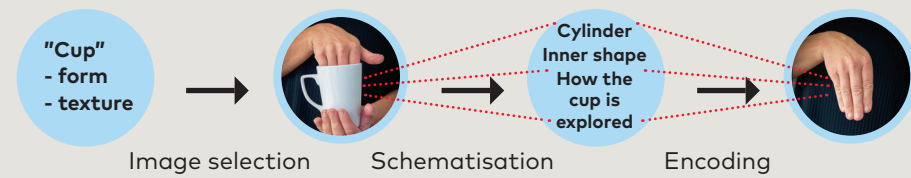
Persons with congenital deafblindness have limited access to conventional sign language as a first language unless they have sufficient functional residual vision. This creates problems with access⁷; accessing visual sign language may prove difficult. When looking at the expressions made by the person with congenital deafblindness themselves, we can see that the expressions most often are not

based on the visual sign language; rather the linguistic expressions arise from what they are sensing through the bodily and tactile modality. These observations can be explained using cognitive linguistics. Simply described, cognitive linguistics states that one does not need to have a formal language, spoken or signed, to express what one thinks of, or is focused on. The expressions are shown as they have been experienced through the body/tactually. An example of this is how one can use the body to express how one has perceived or experienced an activity. If the activity is riding, this can be expressed by the person with congenital deafblindness miming his/her perception/experience of the riding activity. This is called mimetic expressions. In relation to sign language we can see that mimetic expressions are equivalent to the use of active iconicity.⁸

Tactile iconicity

Persons with congenital deafblindness can construct signs showing the tactile impression coming from the form and function of what they have been exploring. This leads us to tactile iconicity.

Figure 2 The process of sign construction: How an iconic sign is created in tactile modality



Sign constructions based on tactile iconicity undergo the same process as sign constructions based on visual iconicity.⁹

Figure 2 depicts an example of how a cup can be explored and how signs can be constructed based on this exploration. In this case, it is the inner form of the cup that is in focus when being explored. The manner the cup is explored gives tactile information about its characteristics which again can be represented in the sign construction expressing CUP. Here the sign is a tactile iconic sign; the handshape shows the iconic representation of the cup's characteristics. It is important to notice that the exploration process can lead to many potential sign constructions, always based on how the object is explored, pictured here:



The tactile iconic sign constructions illustrated in the pictures, are easy to understand, as they contain few characteristics of the object that are identifiable if one has observed the way the objects have been explored. We shall therefore look at another example, containing more characteristics put together, where the complexity of the expression is greater. The example we will use is the exploration of a wall. What we can observe is that this specific wall consists of brick with grooves in between. The way

⁷ Nafstad & Rødbroe, 2015
⁸ Erlenkamp, 2009

⁹ Forsgren, 2016



the wall is explored gives tactile information about the wall's characteristics. Each part of the wall is explored and made into a "whole" and the complex information creates the basis for the sign construction. This occurs, as mentioned earlier, through the process of sign construction involving image selection, schematisation and encoding. The sign being constructed shows tactile iconic similarities with the object explored. Sign constructions based on tactile iconicity most often have low readability as they deviate from our understanding of cultural language. The readability of the sign can be heightened if the communication partner is aware of and preferably participating in how the exploration of the object occurs. This will give us more cues for how the person with congenital deafblindness builds up his/her understanding of the object. At the same time, we can make hypotheses

concerning possible sign constructions that can be result from this specific way of exploring the object.

Now we will look at the example of the brick wall being explored and how the exploration of the parts can be made into a whole, constructing a sign that shows tactile iconicity. As we can see from the pictures, this wall consists of horizontally placed bricks with joints in between. The joints can be perceived as grooves, placed deeper than the bricks themselves. When exploring the wall, one gathers tactile information about its characteristics, and constructs a tactile image of how this wall looks/feels. Through this exploration, one perceives horizontally placed bricks in a line, and over and under each row of bricks there are grooves and the rows of bricks repeat themselves. The exploration is the basis of the sign construc-

tion process; which parts of what being explored must be translated as well as which parts are possible to represent by different handshapes and how one can show the overall structure of the wall in one sign.

When we look at the sign constructed in the last picture, we describe this in sign language as a 5 hand with bent thumb. Each of the fingers will here represent a row of bricks, the opening between the fingers shows the grooves and the bent thumb refers to how the thumb rested in the cracks during exploration. The sign constructed can be interpreted as: This is a wall with horizontal elements with grooves in-between. The sign is a specific sign for this specific wall. Other walls with other characteristics will have their own signs based on the impressions obtained through exploration.

Conclusion

If we as communication partners are to learn how to decode sign constructions based on tactile iconicity, it is important that we trace them back to their origin. This only means that we must try to imagine the form or the function of what has been explored before it has been represented by a sign. This is of course easier if we have participated in the exploration and have observed the way the object(s) have been explored. This way the sign will have higher readability. The signs constructed in this fashion are distinctive for the person constructing them, meaning they are idiosyncratic. In addition, there can be several potential expressions for the same object explored, reliant on how the object in fact has been explored. If the person with congenital deafblindness is to have more communication partners, not only the ones who

know the idiosyncratic signs, it is important to negotiate the signs and try to map them on to conventional signs. For this to happen, we must start with the sign constructed by the person with congenital deafblindness, answer the sign and negotiate shared understanding of its content. This way we stabilise the sign will have the same meaning for both the person with deafblindness and the communication partner. When the sign has been stabilised, we can introduce the conventional sign every time the idiosyncratic sign is presented by the person with congenital deafblindness. This way

we answer the original sign and expand the vocabulary by using the conventional sign with the same meaning as the idiosyncratic sign. This process is called sign mapping. Read more about this way of "linguaging" in chapter 9. It is important to remember that when introducing new and conventional signs, the person with deafblindness must also be instructed. We instruct by working hand over hand, showing how the sign in fact is performed. This way we give access to the new linguistic elements that build upon the original sign constructed by persons with congenital deafblindness themselves.

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References

Erlenkamp, S. (2009). "Gesture verb". Cognitive-visual mechanism of "classifier verbs" in Norwegian Sign Language. *CogniTextes. Revue de l'Association de linguistique cognitive*, 2009:3, 1-32.

Forsgren, G.A.G.C. (2016) *The Emergence of Sign Constructions Based on Heightened Tactile Perception. The proposition of a New Sign Category* (unpublished Master thesis). Groningen, University of Groningen.

Nafstad, A.V. (2018). The authentic communication of the congenitally deafblind. *På enhver mulig måte – perspektiver på typisk og atypisk utvikling av kommunikasjon og språk. Festskrift til professor emeritus Stephen Von Tetzchner*. Psykologisk Institutt. Universitetet i Oslo, 193-204.

Nafstad, A. & Rødbroe, I. (2015). *Communicative Relations: Interventions that create communication with persons with congenital deafblindness*. Aalborg: Materialecenteret.

Taub, Sarah F. (2001). *Language from the body. Iconicity and Metaphor in American Sign Language*. Cambridge University Press.

Vege, G., & Bjartvik Frantzen R. & Nafstad A. (2004). *Spor*. Andebu: Andebu Døvblinde senter og Skådalen Kompetansesenter.

11.

Language development in the tactile modality through outdoor activities

JOE GIBSON

KEYWORDS: OUTDOOR ACTIVITIES, LANGUAGE & COMMUNICATION DEVELOPMENT,
AUTHENTIC EXPERIENCES, RELATIONSHIPS

This chapter will examine why outdoor activities and the natural environment are so good at helping with the development of language in a bodily tactile modality. I will look at three aspects of the activities; stimulating authentic experiences, relationships and the natural environment itself, which seem to be key. The chapter will conclude by looking at how we might re-enforce this communication development.



Introduction

In my time working in the field of deaf-blindness using outdoor activities one thing has been central and that is the development of language in a bodily tactile modality. This regards both the necessity of using language to describe and explain the activities and using the activities as a way of eliciting bodily tactile traces and meaningful utterances. In this chapter I will first examine why I believe outdoor activities and the natural environment to be helpful for developing this kind of communication. I will then look at ways of supporting this development.

This chapter is not based on a single case or project, rather it is a cumulation of over twenty years of work in the field of congenital deafblindness and outdoor activities. Nevertheless, there are several significant projects that have had a major influence and that I will refer to. I came to the deafblind field from an outdoor education background and my PhD project¹ offered the opportunity to learn from two men with whom I worked, "Bill" and "Fred". Trying to understand their experiences of the outdoor activities was the start of my journey. This was consolidated over ten years working as Sense Scotland Outdoor Activities Co-ordinator, which also taught me the value of project working. The Deafblind International Outdoor Network, and its informal predecessor, has been an invaluable forum in which to discuss and develop ideas with international colleagues and

share outdoor experiences with our deaf-blind partners. Two long term projects in Norway, "Friluftskurs"² and "Bua Mi"³, have reinforced for me amongst other things the importance of having fun and scaffolding⁴ respectively. Finally, this last year working at Skådalen school for the congenitally deafblind has given me the opportunity to explore the more formal educational possibilities provided by the activities.

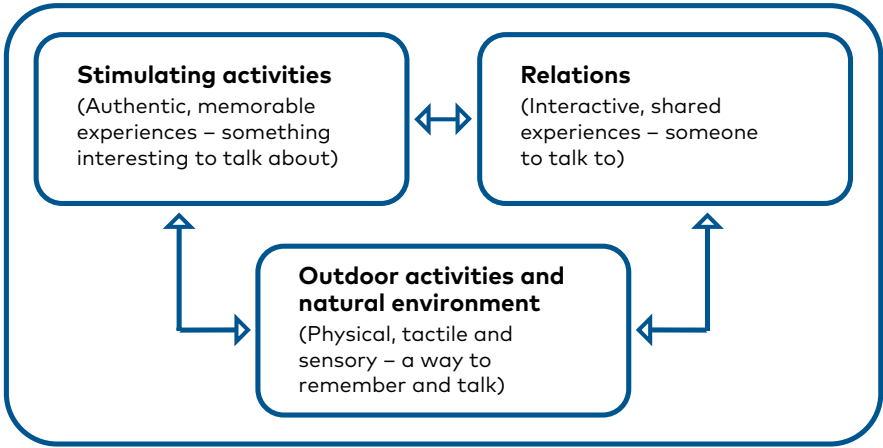
How do outdoor activities help with communication development?

A model of the role of outdoor education in communication development with people with deafblindness that was first presented in my thesis⁵ has recently been updated.⁶ The updated model now has three key features of outdoor activities that benefit communication development with people who have congenital deafblindness. Figure 1 focuses on these three features; stimulating activities, relationships and aspects of outdoor activities and the natural environment. The three key features are outlined below with examples.

Stimulating activities

To communicate you must have something you want to share with someone else. This is true not just for the deafblind participants but often also for the partners. This can be crucial when it comes to retelling and sharing the story. If you were scared when climbing or if you were cold and wet crossing the river you do not have to pretend or dramatise these

Figure 1 Three key aspects of outdoor activities that benefit communication development with people who are congenitally deafblind



feelings. The authenticity of the experiences during outdoor activities is key, and means you have a meaningful subject to communicate about.

During a discussion of a climbing wall session with one participant, the day after the activity, the participant kept rubbing their elbow. I helped push up the sleeve and there was a small red mark, so we talked about the sore elbow. Later I watched the video from the previous days climbing wall session and noticed the participant had banged their elbow during the session. I was then able to go back and talk with them about how they hurt their elbow climbing. Over the next few days several other people told me that this participant had shown them their "sore" elbow and was very satisfied when they linked the injury to the climbing. This was a big, authentic experience from the climbing wall session for this participant. It was also a reminder for me that it can sometimes be different aspects of the activity that are important for the participants.

Relationships

Outdoor activities have been shown to help in developing a wide range of relationships for people with congenital deafblindness.⁷ In particular the interactive, shared nature of the activities also means that there is someone, who was also present during the activities, to talk with about the experience. This is important as the communication is likely not to involve formal words or signs, but gestures based on the activities and memories. Read more about this in chapter 9.

During an outdoor walk a participant met a horse and spent time exploring its head,

¹ Gibson, 2000 & Gibson, 2005

² Brede & Steigen, 2014; Gibson, Nystuen & Langsjøvold, 2017; Hagen, 2012

³ Brede, 2013; Brede, 2014; Brede & Steigen, 2014

⁴ Vygotsky, 1986.

⁵ Gibson, 2005 p. 315

⁶ Gibson and Nicholas, 2018 p. 16-17

⁷ Gibson, 2005, p 315



especially the nose and mouth. When we got back to the car the participant kept putting his face into his hands. At first, I thought he might be smelling the horse, but then noticed he was breathing out and blowing. It seemed he was recreating the feel of the horse's warm wet breath and when I asked him if he was thinking about the horse he got very excited. If I had not been with him during the walk, and also experienced the horse's breath on my hands, I do not think his actions of recreating the activity would have made me think of horses.

Outdoor activities and natural environment

The third aspect identified, which is the most recent addition to the model, is the nature of the activities and natural environment that lend themselves to being discussed in a non-verbal tactile way. The activities often involve large bodily movements (the actions of canoeing

or climbing) which can easily become tactile signs. There is often equipment involved (canoes, paddles, wetsuits, skis, poles, ropes, carabiners and helmets for example) which can be explored, played with, worn and discussed. The natural environment is also rich in various sensory sensations, (soft moss, hard trees, resin from trees that is sticky and sweet).

During the activities that formed part of my research one of the participants, Fred, and I had many conversations about his climbing helmet. The video footage from his first time climbing shows him clearly exploring the helmet as we climbed, although I did not notice this at the time. During our conversations it was apparent that the helmet was of the upmost importance to Fred and he would put it on and take it off repeatedly and ask me to fasten and unfasten the buckle. Over time we negotiated this as his way of finishing a climb. He would take my hands

to his helmet buckle and then we would lower ourselves down to the floor and then unfasten and take off his helmet. The helmet for Fred had strong links to negative experiences in his past and we were able to now give him control of the activity through this same piece of equipment.

This model and the three features are still evolving, and they seem to be related. Indeed, each of the three short cases could have been used as examples in each of the three features and maybe it's not the three features alone but the interplay between them that makes outdoor activities so successful in tactile communication development. Also threading through the three areas is the concept of joint action. We share the same activity and show an interest in each other's interest in the activity. When we physically do the same things together, we are more likely to physically feel the same things or have the same tactile impressions. The authenticity of the activities also means we might emotionally feel the same, or at least similar things.

How can we maximise the opportunities for communication development through outdoor activities?

So, how can we maximise the opportunities for communication development outlined above? In the previously published versions of the model there is a phase of "follow up" referring to things we can do after the activities themselves. Below I will outline things we can do both before and after the activities along with a brief discussion of project working.

Before: Scaffolding and creative preparation

Preparation for new activities is essential and this can often require creativity!

When introducing new activities the instructional concept of scaffolding can be very useful. That means supporting the development of a new activity by breaking it down into separate parts that can be built into the whole activity, rather than just starting with the whole activity. Scaffolding refers to both the skills required and also the concept of an activity or the communication required. For example, before climbing for the first time you can first introduce a sign for climb. You may walk on increasingly steep grassy slopes until you need to use your hands then use the sign "climb". You can also climb over familiar equipment in the gym to reinforce the sign linking it with the actions. You can spend time playing with and naming the new equipment (helmet, harness, ropes, carabiners etc.) to make them familiar. You might even want to visit the venue (climbing wall or crag) so that this becomes familiar as well. If possible, you may then combine the new sign and use the equipment in a safe setting. For example, put on the harness and tie the rope to feel how it pulls, then maybe climb a ladder or onto something familiar to use the sign and maybe have the rope secured to feel how it is to sit in the harness and not fall to the ground. Then you are ready to go climbing!

After: Retelling and sharing activities

There is a variety of different ways to use an activity to maximise the communication development potential after the activity itself. The simplest is to talk about it in either a structured or unstructured way. It may be the case that due to the nature of the activities you cannot talk at the time (halfway through a rock climb might not be best time to talk about the climbing helmet.) Also, it may not be you, the activity partner, to whom the deafblind partner tells about

the activity, after all, you were there! So having ways to share what happened through video, photos and written reports or diaries might give clues to others as to the "important" bits that someone wants to talk about. You can encourage the deafblind participant to use signs or gestures that are meaningful to them to talk about their experiences. It is worth remembering that it might not be the things you remember from the activity that are important to the other person! Using a range of art activities to support the retelling and sharing of stories has also shown successful. Whether this is displaying created, found or used objects related to the activity, or recreating parts or the whole of a story. There is a case study about a tactile sculpture. It shows an incident where a shoe was lost in the mud in the forest, and it is being used as a reminder of this significant incident.⁸

Framing activities in a narrative storyline

The way we work during activities can also help maximise the potential for the development of tactile communication. Framing activities in a narrative structure or storyline can be a great help in understanding what is happening and lends itself to retelling and sharing the story afterwards. Marking significant moments in a tactile way during the activity can help in any discussions later. Working in a project style can also be of use, linking many different activities together. Having a range of activities around a theme can enable you to reinforce new signs and approach more difficult or abstract concepts from different directions using different methods. For example, a project around trees might involve, walking in the forest to explore

trees at different times of the year and in different weather, exploring the difference between different types of trees, collecting things from trees (bark, leaves, flowers, seeds etc.), planting seeds to grow new trees, climbing up trees, using different trees as locators or cutting down trees. Read more about rehearsals in chapter 13, Tactile cognition and language development.

Conclusion

Outdoor activities can be a great way to develop tactile communication with people who are congenitally deafblind. Just doing activities can provide interesting subjects for conversations and there are also things we can do to maximise the communication development potential before, during and after the activities and in the way we frame and organise them. This is especially true when we do the activities together as "joint action". Not only might we recognise tactile gestures and non formal signs, because we were there too but the authenticity of the experiences will also be relevant to us as partners. Indeed it may be that the interest in each others interest (in the activity or experience) becomes the focus of our conversations.

Deafblind International has an "Outdoor Network" which is a good place to find people who use or are interested in outdoor activities with people with congenital deafblindness. If you want to find out about the outdoor network visit deafblind Internationals website and look under Networks or join the Facebook group called "Outdoor Network, Deafblind International".

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⁸ Gibson and Nicholas, 2018 p. 21

References

Brede, K. S. (2013). *Språkutvikling gjennom meningsfull aktivitet - videreføring. Taktil kommunikasjonsutvikling hos en person med medfødt døvblindhet i tilknytning til bygging av BUA-MI Part 1 av 2.*

Brede, K. S. (2014). *Språkutvikling gjennom meningsfull aktivitet - videreføring. Taktil kommunikasjonsutvikling hos en person med medfødt døvblindhet i tilknytning til bygging av BUA-MI Part 2 av 2.*

Brede, K. S. & Grete A. Steigen, G. A. (2014). *Skole uten vegger: Språk og språkutvikling gjennom meningsfull fysisk aktivitet. Rapport juli 2014.*

Gibson, J. (2000). Fred outdoors: An initial report into the experiences of outdoor activities for an adult who is congenitally deafblind. *Journal of Adventure Education and Outdoor Learning* 1(1), 45-54.

Gibson, J. (2005). *Climbing to communicate: An investigation into the experiences of congenitally deafblind adults who have participated in outdoor education* (Unpublished PhD thesis). Glasgow, Scotland: University of Strathclyde.

Gibson, J. & Nicholas, J. (2017). A walk down memory lane: on the relationship between autobiographical memories and outdoor activities. *Journal of Adventure Education and Outdoor Learning*, 18(1), 15-25.

Gibson, J., Nystuen, S. K. & Langsjøvold, S. J. (2017, September 5th). *Friends from the wild: Developing relationships through ongoing outdoor activities.* Upublisert workshop ved Touch of Closness: Maintaining social connectedness, 9th Dbl European conference on Deafblindness, Aalborg, Danmark.

Hagen, M. U. (2012). Vi tør, vi vil, vi kan! Døvblindes hverdag: Synlighet, faglighet og dokumentasjon. Nordisk konferanse om døvblindhet. Soria Moria, Oslo, 23.-26. april 2012

Vygotsky, L. (1986). *Thought and Language.* Cambridge, Mass.: The MIT Press. ISBN-13: 860-1416745183.

Embodiment: from bodily experiences to meaning construction

KIRSTEN COSTAIN

KEYWORDS: EMBODIMENT, COGNITION, MEANING CONSTRUCTION, COGNITIVE SCHEMA, METAPHOR

This chapter is about how we create meaning from our physical, bodily experiences. Two perspectives on bodily, or embodied cognition are described: embodied semantics and radical embodiment. First, an example from practice of meaning creation by a child with congenital deafblindness who encounters a new experience is described. The child appears to reflect on his experience with the use of bodily expressions and signs. The example can be viewed in relation to two theoretical perspectives as an example of embodied cognition and meaning creation.

Bodily, or 'embodied' cognition

There is now broad agreement within research on cognition, thought and learning processes, that the body plays a role in how we think. Debates remain however regarding the significance of the body's role for cognition, and of what this role consists.¹ Questions we must ask ourselves are what it means to say that the body is important for cognition, and how the body is important for cognition.

In general, the perspective of embodied cognition emphasises three contexts in which mind and body are connected:

1) the context of the body and bodily movement; 2) the context of the body and physical surroundings, or 'situated' cognition; and 3) the context of the body and social surroundings, or embodied communication.²

However, the model that emphasises cognition as a brain-based process is still dominant. This model views the brain as a type of computer in which thinking, and learning are the results of these processes. These processes can be divided into separate systems, and further into sub-processes and products that belong

¹ Wackerman, 2011

² Tschacher & Bergomi, 2011

to each of the systems. This model views the neurological system of the brain as the source of cognition. The neurological system of the body in its entirety not limited to the brain is neglected in this model.

There are several other perspectives that attempt to include the neurological, sensory-motor and perceptual systems of the body in descriptions of cognition. I wish to focus on two of them in my description of how embodied experiences can create a foundation for meaning construction: embodied semantics and radical embodiment.³ Before I go further with this, I will present an example from practice of a child with congenital deafblindness who shows use of embodied cognition and language in a situation in which he encounters a new experience during a walk with his teacher:

Example: categorisation of a new experience of "bounciness"

Jimmy is a ten-year-old boy with congenital deafblindness who is completely deaf and who has residual senses. He and his partner are on a walk in the woods along a route they have walked many times before. When they come to a small opening where a path runs down to a stream, the partner sees that there is a new thing to explore – a wooden bridge that looks like the one in the story, "The three billy-goats gruff". Jimmy and his partner walk up onto the bridge and

find that it moves up and down slightly under their weight. The bridge moves very similar to the way the trampoline in the school gym does when Jimmy hops on it. Jimmy has much experience with playing on the trampoline and is very interested in it.

Jimmy hops a bit up and down on the bridge and creates a stronger hop-up-and-down movement. He continues with this and begins to pat the back of his head with the flat of his hand, two clear strokes, and repeats this several times. The partner recognises this and interprets it as a negotiated sign for STROLLER⁴, a large stroller with bicycle wheels that Jimmy sits in when he is tired and needs a break. The way the stroller moves (hop-up-down) has created a BET, or a bodily emotional trace, a slight forward and back hit between the back of his head and the back of the stroller seat when being pushed forward. Some time ago, Jimmy began to use a self-created sign, clapping the back of his head with his palm twice in connection with the desire to go out/for a walk, to climb into the stroller, take a break, and so forth.⁵

While he is still hopping on the bridge, Jimmy chooses to move the sign location from the back of his head to the top of his spine, where he repeats it several times. Suddenly, he lies down flat on his back on the bridge while it is moving under him, and just as suddenly jumps up again after

a couple of seconds, then repeats this sequence. The partner thinks that it looks like Jimmy is commenting on or reflecting over the bouncy qualities of the bridge rather than merely using it to bounce on.

It seems, in the way he expresses himself, as though he is engaged in a categorisation process in which he refers to a similar bouncy quality in relation to the stroller, the trampoline and the bridge. In the stroller with the big bicycle wheels, his head bangs back and forth on the back of the seat and his body bounces up and down while the stroller is pushed over uneven ground. On the trampoline in the gym, he hops to get the bouncing started and then throws himself down on his back to continue bouncing. Jimmy has here used a self-created sign for STROLLER that has been met previously and become part of his vocabulary used with his partners. The expression has its origin in a specific object (the stroller), and to the bodily experience he has of it, while here it is located to a new part of his body (a new sign location) with the same form and movement. Finally, he lies down flat on his back on the bridge which is the source of this new hop-up-and-down experience and continues with this new version of the same movement.

While he does all this, it seems as though he is using the negotiated BET, STROLLER, and extending its schematic

elements to classify a new experience (hop-up-and-down on the bridge). When he lies flat on his back on the bridge for a moment while it bounces, it appears that he is comparing bouncing on the bridge with bouncing on the trampoline. It seems that Jimmy is making a type of comparison of bouncing on this new surface with his experiences of both the trampoline and the stroller. He does this by using concepts within one or several categories that belong to both objects, such as "things one can bounce on", "being able to bounce", the quality of "bounciness", etc.

It is important to remember that what Jimmy is exploring here, both physically and cognitively is primarily "bounciness"/being able to bounce on something rather than an object in itself, and certainly not "a bridge".⁶ A step further for the partner in this situation and further in other situations is to explore this thing the bridge, with all its qualities. This facilitates the forming of a concept about "bridge" and the expansion of the concept of "things in the world". In the exploration and naming with signs of all the qualities of that which is/can be a bridge, one also explores many other concepts that can be transferred to other experiences of other objects. In this way, a conceptual apparatus is built, as well as a linguistic practice connected to embodied experiences. You can read more about such cognitive strategies in chapter 13.

³ Gallagher, 2011

⁴ Jimmy's expression/sign STROLLER, in his use of it, refers to many things: the desire to take a break, to go for a walk or as a comment about going for a walk, feeling tired, the memory of being with someone on a walk or about a walk that has taken place/perhaps will take place today, and many other things, thoughts and feelings. The child uses rather than has a language, and language has its existence only when it is used (for an argument for this claim see Costain, 2019).

⁵ This expression can be described as a sign in that it combines handshape, placement and movement (Forsgren, 2018; see also chapter 10).

⁶ I thank Anne Nafstad for reminding me of this very important point. One must constantly ask oneself in interpreting expressions about what it is that the child is primarily concerned with and referring to by going back to what the child is doing, there and then, and what he or she has done, or has a memory of. One must ask oneself how the memory has become relevant in just this present situation. Object understanding, understanding that something is an object, is perceptually/cognitively complicated, also because of deafblindness. This is both obvious and at times paradoxically enough, difficult for partners to remember. This is because of the taken-for-granted-ness that lies in how we as seeing and hearing partners experience the world as built up of objects.

I will now describe two theoretical perspectives that can help us to understand what it is that Jimmy is doing in this example.

TWO THEORETICAL APPROACHES TO EMBODIED COGNITION

Embodied semantics

This perspective describes the body as a "semantic engine".⁷ The word 'semantic' generally refers to linguistic and philosophical studies of meaning. In an embodied semantic perspective, conceptual awareness begins in physical movement in space, and meaning is created through embodied experiences.⁸ The bridge between this embodied experience and conceptual thinking is what Johnson calls metaphorical comparison. In a metaphor, things are understood and described through terms that have to do with another thing. In a metaphor, we do not say that something is like another thing but rather describe that thing as though it was the other thing.

Here is an example of this. In a poem, for example, or other literary work we can say that "the wind inspected every crack in the old barn". In this image, the wind is a thinking being, an animal that has the capability of exploring something. Another example is the poem that begins: "The fog came in on little cat feet". Metaphors like these are implicit comparisons that exploit what is similar between two very different things. In the comparison, we stretch the idea of the one thing over to a description of another, very different thing or experience.

This complex comparison process creates a foundation for all categorisation of experiences. Johnson speaks about how what he calls fundamental image schema from experiences in the world create the possibility for thinking.⁹ The extension of an image or sensory experience to another through imaginative, metaphorical comparisons leads to the formations of concepts in new experiential arenas and types of experience.

Gallese and Lakoff claim in their research that brain research shows that all bodily actions and sensory perceptions use brain-based pathways that fit each type of action or sensory perception.¹⁰ For example, when one "reaches for an object, one uses neural parameters for direction; grasping an object involves use of the neural parameters for force, etc.". These parameters, or neural pathways are also related to cognitive image-schema such as *being inside something* (or 'containment', the bodily experience of being in or encapsulated by something) and up \leftrightarrow down schema.¹¹ The word 'image' refers here to an impression from a specific sensory modality: visual, auditory, tactile-sensory or vestibular images.

Johnson defines these image schema as cognitive structures or frameworks that belong to different activities and which we use to organise our sensory, bodily experiences. He emphasises that this process and others that are part of how we organise our world are dynamic processes. Without this organisation, the world would be perceived as fragmented

and chaotic. These schematic structures are repeated patterns, forms and routine events in continuing, structured activities. Experiences such as being lifted or put down or being fed or changed are examples of such events.

Repeated events that have a recognisable structure or pattern are connected to concrete physical experiences in the daily life of the child. Perception and interpretation of the world is then not theory-based, where the individual must apply abstract theoretical principles separate from experience to achieve understanding of what is happening here-and-now. Instead, these schematic structures from everyday events create a foundation that makes it possible for us to reflect over and analyse our experiences at a more complex cognitive level. You can read more about this in chapter 3, "What did you mean NOW?". In the embodied semantic perspective, this creates a natural foundation for the development of linguistic and meaning-creating structures. Both the way we organise our language and the meanings we construct through language are based on sensory structures that we develop experientially through our physical, bodily experiences.

Radical embodiment

Another perspective with relevance for our example of Jimmy is what is described as the enactive perspective on cognition.¹² Cognition and perception are viewed as enactive, or in relation to how cognition and perception occur in the form of actions and processes. The

perspective is called 'radical' because it emphasises that cognition is not possible at all without involvement of the whole body, not just the brain.¹³ This is to say that the body is completely fundamental for cognition to occur. This perspective is a pragmatic, or action-oriented perspective on cognition because it emphasises that cognition is both an action and *is for* action.¹⁴ This approach draws on ideas from all the other perspectives on embodied cognition. It emphasises that cognition is distributed across the brain, bodily systems and the environment. It claims that the body is not merely playing a supportive role in its contributions to consciousness and cognition, but rather is irreplaceable: bodily systems are completely necessary for cognition.

This perspective focuses on the complex relationships between brain, body and environmental systems. This is very different compared with the dominant processing model described earlier that describes the brain as a sort of computer. In radical embodiment, perception and cognition are actions that are dependent on sensory modalities, but not limited to one or the other of these. Perception and cognition occur through sensory modalities in use in the actual situation, and the processes are often multi-modal.¹⁵

Gallagher emphasises how, at the beginning of its development, cognition is a process of "following the intentions or aims of the other". He refers to research on mirror neurons, neurons that are activated when we see or perform actions, as well as Trevarthen's research on primary

⁷ Lakoff & Johnson, 1999

⁸ Johnson, 2010

⁹ Johnson, 2010

¹⁰ Gallese og Lakoff, 2005

¹¹ Johnson, 1987

¹² Thompson & Varela, 2001; Gallagher, 2005

¹³ *Radical*, meaning 'the root of'

¹⁴ Gallagher, 2011

¹⁵ Aziz-Zadeh & Damasio, 2008

intersubjective processes.¹⁶ In this perspective, perception is for interaction with others, and forms the basis for social cognition and meaning creation based on active participation in the world.¹⁷ This is different from theorising about what other people are doing and why, such as in the 'Theory of mind' approach.¹⁸ We interpret other people through a type of embodied reading of their intentions in a given situation here-and-now, in the moment. In infancy, we respond to embodied-muscular movements while we follow the other in an immediate physical way. After some time, we develop more complex ways of interpreting the world through more complex bodily experiences and the metaphorical bridge-building described by Johnson above.

Conclusion

The example of Jimmy and the bridge shows something that perhaps is part of such a categorisation process. Embodied cognition is something that involves the whole body, including the brain. The building blocks for meaning construction lie in our bodily tactile experiences and in relation to sensory schema that are built up and become more complex through new experiences. Constantly increasing complexity makes these schemas more and more useful and generalisable in the categorisation of new experiences.

Of course, we cannot know what Jimmy is thinking, but we can attempt to interpret what he does. This is what is meant by taking a pragmatic, action-oriented perspective on embodied meaning construction. That Jimmy is cognitively exploring a new experience in an

The building blocks for meaning construction lie in our bodily tactile experiences and in relation to sensory schema that are built up and become more complex through new experiences.

embodied way, also with the help of negotiated, self-created signs seems very likely, however.

Jimmy is here moving cognitively from an embodied tactile awareness to a more reflective form of cognition that also involves linguistic elements. This more reflective cognition uses symbolic expressions such as his sign for STROLLER, and actions such as his references to the bridge/source of the bouncing rather than merely using it to bounce on. He uses his experiences with the stroller and the trampoline as metaphors for bouncing on the bridge. The argument I make here is that he does this to classify this new experience of something he has done before in relation to how this experience is similar at the same time to those he has had previously. The bridge is the source of a new experience of bouncing that has clear bodily tactile similarities with other well-known experiences of both the stroller and the trampoline. The bridge, the stroller and the trampoline are things in specific situations that provide access to bouncing. This can be viewed as an example of movement from embodied perception and experience to higher-order meaning construction.

¹⁶ Gallagher, 2005; Trevarthen, 1979

¹⁷ De Jaegher, et al., 2010

¹⁸ Baron-Cohen, 2008

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References

Aziz-Zadeh, L., & Damasio, A. (2008). Embodied semantics for actions: findings from functional brain imaging, *Journal of Physiology-Paris*, doi: 10.1016/j.jphysparis.2008.03.012.

Baron-Cohen, S. (2008). *Autism and Asperger syndrome*. Oxford: Oxford University Press.

De Jaegher, H., Di Paulo, E., & Gallagher, S. (2010). Can social interaction constitute social cognition? *Trends in Cognitive Sciences*, 14, 441-447.

Forsgren, G. A.G.C., Daelman, M., & Hart, P. (2018). Sign construction based on heightened tactile perception by persons with congenital deafblindness. Vol. 4 (1), 4-23.

Gallagher, S. (2005). *How the body shapes the mind*. Oxford: Clarendon Press.

Gallagher, S. (2011). Interpretations of embodied cognition. In W. Tschacher & C. Bergomi (Eds.), *The implications of embodiment: cognition and communication* (pp. 59-71). Exeter: Imprint Academic.

Gallese, V. & Lakoff, G. (2005). The brain's concepts: the role of the sensory-motor system in conceptual knowledge. *Cognitive Neuropsychology*, 22 (3/4), 455-479.

Johnson, M. (1987). *The body in the mind: the bodily basis of meaning, imagination, and reason.* Chicago: The University of Chicago Press.

Johnson, M. (2010). Metaphors and cognition. In S. Gallagher & M. Schmi-
cking (Eds.), *Handbook of phenomenology and cognitive science.* Dordrecht:
Springer.

Lakoff, G. & Johnson, M. (1999). *Philosophy in the flesh.* New York: Basic
Books.

Thompson, E. & Varela, F. J. (2001). Radical embodiment: neural dynamics
and consciousness. *Trends in Cognitive Sciences*, 5(10), 418-425.

Trevarthen, C. B. (1979). Communication and cooperation in early infancy: a
description of primary intersubjectivity. In M. Bullowa (Ed.), *Before speech.*
Cambridge. Cambridge University Press.

Tschacher, W., & Bergomi, C. (Eds.) (2011). *The implications of embodiment:
cognition and communication.* Exeter, UK: Imprint Academic.

Wackerman, J. (2011). In quest of human nature: rediscovering the body. In
W. Tschacher, & C. Bergomi, (Eds.), *The implications of embodiment: cogni-
tion and communication* (pp. 3-30). Exeter, UK: Imprint Academic.

Tactile cognition and language development: What are tactile working memory and autobiographical memory?

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**KEYWORDS: COGNITIVE INFORMATION PROCESSING, TACTILE COGNITION, TRANSACTIONS,
WORKING MEMORY STRATEGY, AUTOBIOGRAPHICAL MEMORY STRATEGY**

Tactile cognition refers to the processing of bodily tactile experiences. It also includes the mental processes of these experiences in working memory and autobiographical memory. This chapter addresses the cognitive aspect of language in the tactile modality and emphasises cognitive information processing and language learning. It is concluded that if the communication partner manages to facilitate effective tactile cognitive strategies, this will positively support language development in persons with congenital deafblindness.

Over the years, various theories and approaches have been applied and developed to study and analyse the development of social competence, communication and language in persons with congenital deafblindness.¹ Over time, the approaches used in deafblind services have moved from mechanical and adult methods to teach communication interventions based on natural learning conditions which emphasise reciprocal interplay, sharing meaning in communicative sequences and dialogicality. However, the Cognitive Information Processing approach to language has been scarcely addressed in the deafblind field.

Taken as a whole, the brain consists of a highly advanced system for the processing of information. Cognitive Information Processing is a theory focusing on internal mental processes. For example, in modern research in neuroscience, the functioning of working memory and long-term memory is studied in order to investigate the relationship between behaviour and language in the brain.

One major assumption of the cognitive information processing theory is that all cognitive activities including language, involve mental processes that operate over real time on internal, symbolic representations of information.

Let us now investigate the cognitive information processing system and understand the nature of tactile representations in this system.

Cognitive information processing in the tactile modality

Although the underlying mental processes and the governing principles of the cognitive information processing in the visual and auditory modality have been studied intensively, there is now evidence suggesting that the cognitive information processing in the tactile modality is an equally robust system.²

Cognitive information processing in the tactile modality involves multiple types of sensation from the body. These bodily sensations are formed from several physical sensations as touch, pressure vibration, temperature and proprioception, and are mediated by the bodily sensory systems.³

The processing of bodily sensations by the brain involves several processing systems, such as the sensory register, short-term memory, working memory and long-term memory. Notably, the processing units of working memory and long-term memory may help create mental representations in consciousness and are critical elements for language development. For instance, scientific studies have shown strong links between working memory and children's emerging language abilities⁴, between working memory and learning a new language⁵ and between working memory and sign language.⁶ Furthermore, research shows that long-term memory also plays a key role in supporting children's language development over the school years.⁷

I will now describe the characteristics and core mechanisms of working memory and long-term memory in the tactile modality.

Working memory in the tactile modality

Working memory is the mental workspace that keeps track and works with information, according to the needs of the moment.

Tactile working memory refers to the mental processes involved in retaining relevant bodily tactile information in an active and readily available state over time. In other words, tactile working memory serves as a temporary holding area for incoming and outgoing bodily tactile information, as well as a storage space for tactile linguistic information during immediate processing. Tactile working memory has been found to be altered through experience indicating that tactile experience plays a crucial role in shaping working memory.⁸

Long-term memory in the tactile modality

Long-term memory is the mental processing system allowing information to be stored permanently and where it can later be recovered. Experiences and learning gained through activity and movement which are stored in long-term memory can be recovered by actively using touch and body movements later on.

Modern cognitive theories often distinguish between two forms of stored knowledge, both of which can be consciously recalled from long-term memory: *semantic* and *episodic*.

Semantic memory refers to general, factual knowledge. It is a more structured overview of facts, concepts and meanings about the external world that we have acquired. For instance, touching a key can lead to it being recognised and used functionally. This is because you can access the semantic properties (usage and function) in long-term memory.

Episodic memory is involved in personal experiences and specific events. One category of episodic memory is referred to as autobiographical memory.

Autobiographical memory is a personal memory of past events or experiences in one's own life. In other words, autobiographical memory is not about factual knowledge of the world, but refers to a personal memory of an event (remembering what), persons involved in the event (remembering who), the place of the event (remembering where) and the time when the event took place (remembering when).⁹

Emotions play an important role in autobiographical memory. Autobiographical memories often involve different degrees of personal importance and emotional involvement, and it encompasses various sensory stimuli.¹⁰

Understanding the development of tactile cognition through transactions

Working memory and autobiographical memory, like many other cognitive functions, have traditionally been viewed as part of the brain's internal mental processing tasks – i.e. thinking. Research over the past two decades, however,

¹ Rødbroe & Janssen, 2006

² Gallace & Spence, 2014

³ Nicholas, 2010

⁴ Engel de Abreu, et al., 2011

⁵ Bosman & Janssen, 2017

⁶ Wilson & Fox, 2007

⁷ Haden, et al., 2011

⁸ Bliss & Hamalainen, 2005

⁹ Gardner Vogel, Mainetti & Ascoli, 2012

¹⁰ Dreyfus, Roe & Morris, 2010

has revealed the central role played by social relationships in cognition. One such perspective, which emphasises the importance of social interaction in cognition, is *the transaction model*.¹¹ The transaction perspective has become central to understanding the interaction between individuals and the environment, with a view to explaining the development of cognition and language.

We know that our own mental processes allow us to handle representations of our immediate environment. Furthermore, it is important to see that dynamic relationships among various personal and environmental factors contribute to cognitive language development. A transactional understanding of cognitive language development supposes that development is facilitated through a two-way, reciprocal interaction between the person and his or her environment. A change in the person can trigger a change in the environment, which in turn affects the person and so on. In this way, both the person and the environment change over time and affect each other in a reciprocal fashion, and early achievements pave the way for later development.

The transaction perspective describes tactile cognitive language development as an ongoing process in which the interaction partner optimises the physical and social environment within a bodily tactile modality. In this way, the transaction perspective highlights reciprocal, two-way influences on the linguistic environment, as well as the responsiveness of communicative partners, and the person's own developing competence.

Communication partners need to have highly developed skills, sensitivity and insight in order to participate in the world children with deafblindness, where touch and proximity are crucial.

Communication partners need to have highly developed skills, sensitivity and insight in order to participate in the world children with deafblindness, where touch and proximity are crucial.¹² In addition, the communication partner must be able to use the bodily tactile modality and cognitive strategies in social interaction.

The use of specific cognitive strategies within a bodily tactile modality can improve the temporary, active maintenance of information in working memory (working memory strategy). Cognitive strategies may also help to link past experiences with present and future actions in the long-term memory (autobiographical memory strategy). As working memory and long-term memory play a key role in language development, using cognitive strategies within the bodily tactile modality could contribute to supporting language development in persons with congenital deafblindness. If the contexts are well established, or if signs are recognisable to the communication partner during the interaction, the partner can build up good cognitive strategies without disrupting the interaction.¹³ You can read more about how contexts can build strategies in chapter 3.

Since this chapter primarily addresses the relationship between the two cognitive strategies and language development, only the strategies related to working memory and autobiographical memory will be highlighted here.

Working memory and autobiographical memory strategies in the tactile modality: what is required?

a) Working memory strategy

In order to keep information activated in working memory over time, we can make a purposeful effort to remember it. One important strategy for keeping information in the working memory is called rehearsal. The rehearsal strategy consists of repetitions, which allow us to retain or maintain information in working memory.

Rehearsal strategies can take different forms in the different senses. Repetition in the auditory modality involves repeating sounds or words to be remembered in a systematic way. An example is to repeat a list of words, such as "dog, tree, fork, dog, tree, fork" again and again in the same order, to make sure that they are possible to remember at a later time. Repetition in the visual modality involves continuous repetition of what is to be remembered of what is seen, in a sequence of different images (spatial repetition). Spatial repetition is used in the same way to retain tactile information of space and direction through the tactile sense involving touch and movement. Rehearsal of tactile information is very important for the rehearsal mechanism for tactile working memory.¹⁴

The effective and spontaneous use of rehearsal strategies has been associ-

ated with better language skills in young hearing children and deaf children.¹⁵

How is an effective tactile-spatial rehearsal strategy used?

An example of opportunities for a person with congenital deafblindness in social interaction:

Jonas is a person living with deafblindness. He has severe vision and hearing loss. Jonas and his communication partner were going for a picnic at the beach. They were driven to the beach in a car.

Jonas and his interaction partner were sitting shoulder-to-shoulder in the back of the car. Jonas seemed very pleased forgoing to the beach and he expressed his emotions in a bodily tactile way. The partner imitated Jonas's bodily expressions and gradually introduced the bodily tactile sign/gesture for "happy" by placing both her hands on Jonas's chest and with an upwards movement.

They arrived at the beach, went for a walk and eventually found a place to sit. They sat on a picnic blanket facing each other. The partner took the initiative for a conversation and signed; "It's nice here". Eventually, when the communication partner asked Jonas what he was thinking about, he replied by using the sign/gesture "happy".

The partner then provided Jonas with an opportunity for using an efficient tactile-spatial rehearsal strategy during the interaction, by rehearsing together several times the sign/gesture "happy"; first on Jonas's own body and then on his own body in a turn-taking manner.

¹¹ Sameroff & Fiese, 2000

¹² Janssen, Riksen-Walraven & van Dijk, 2003

¹³ Nicholas, Johannessen & van Nunen, 2018

¹⁴ Katus, Andersen & Muller, 2014

¹⁵ Bebko & Metcalfe-Haggert, 1997

This example illustrates how the communication partner supported Jonas' working memory and linguistic communication by providing him with the effective and spontaneous use of a tactile-spatial rehearsal strategy.

b) Autobiographical memory strategy

There are three different but overlapping processes involved in the formation of autobiographical memory, in which autobiographical memories are combined into a coherent life story. This story is put into the context of earlier life experiences and becomes part of the self. These three processes are the construction, co-construction and reconstruction of autobiographical memories.

A personally experienced story plays an important role in the process of construction of autobiographical memory. This narrative process helps to maintain a whole episode and not just fragments of scenes. In other words, narratives are not a biography of facts and events in a person's life story, but rather the way in which he or she integrates these facts and events internally – picks them apart and weaves them together again to create meaning. This narrative becomes a form of identity. The things the person chooses to include in the story, and the way it is told, make him or her reflect on the event and contribute to shaping who he or she is. A life story not only tells what happened, it tells why it was important, what it means for who the person is, and for what happens next. In this way, a personally experienced story supports memory as a coherent whole. The whole functions like a supporting framework,

helping the person learn to remember. Conversations about joint memories are important in the process of co-construction of autobiographical memories. When children gradually learn to talk about their personal experiences, they need to be supported by their parents when telling their story. In other words, parent-child dialogues affect children's personal way of telling stories and also help develop their autobiographical memory skills. Nelson & Fivush use the term "memory talk".¹⁶ The term memory talk is used to describe conversations about something that has happened between parents and children. Children gradually learn ways of how to talk about memories with others and thus learn to formulate their own memories as narratives.¹⁷

Sharing stories is involved in the process of reconstruction and has an important social function in maintaining social bonds. Reconstruction provides people with something to talk about. Gibson gives several good examples from outdoor activities and language development in chapter 11. Sharing of personal memories makes social interaction easier by being able to reminisce together. Reminiscing is an activity where one talks about earlier personal experiences. It is an elaborative way of speaking, involving more than just facts and details about the event. Joint reminiscing involves talking about shared experiences with others. It can be seen as a particular form of joint attention, in the sense that there is a joint attention to events in the past.¹⁸

Recently, a study of the tactile form of autobiographical memory has shown

that there are two things that support the formation and stabilisation of a person's autobiographical memory. One of these is focussing on a deafblind person's bodily tactile sensory experiences during outdoor activities. The second is talking about activities in the way they are sensed, so that they are integrated in autobiographical memory as a personal story, i.e. through a narrative process.

An example from a social interaction:

Giving a person with congenital deafblindness an opportunity to use an effective strategy for tactile, autobiographical memory: Maria is a person living with deafblindness. She is blind and has severe hearing loss. Maria and her communication partner were going for a walk in the park.

While they were walking in the park, they came across an old tree-trunk. Maria showed interest and started to tactually explore the tree-trunk in systematic manner. She explored the tree-trunk by feeling its distinct tactile characteristics, such as by exploring the texture and firmness of the tree-trunk in details. She also explored the tree-trunk using gross physical movements, such as by stretching her hands up along the tree-trunk to feel the length of the tree-trunk and holding around the tree-trunk to feel the circumference of the tree-trunk.

While Maria was exploring the tree-trunk, the communication partner took initiatives to share this exploration activity in a joint bodily tactile manner, by placing his hands over Maria's hands when she was stretching her hands up along the tree-trunk; placing his hands over Maria's hands when she was holding around the tree-trunk. After this exploration activity they walked around the park for a while

and eventually found a bench to sit.

The communication partner used the entire episode to create stories, also called conversation in narrative form, with Maria. She did this as they examined the tree trunk (the construction process) and in memory dialogues after the incident (the co-construction process).

The "joint exploration of the tree-trunk" itself became a mini narrative. The communication partner supported Maria in formulating personal memories of the event as a story, a narrative structure. This structure helped to provide a thematic coherence (a familiar topic such as having fun while walking), temporal aspects (placing events in the correct order when navigating from one place to another in the park) and causality (describing and commenting on the various episodes that occur during the walk in the park).

A month later, the communication partner visited Maria at her place of residence. They went outside, found a bench with a table and sat side by side on the bench. The partner started talking about the coffee on the table in front of them. She initiated a conversation with Maria by offering her "listening hands" and "expressing hands".

Consequently, Maria put both her hands in an "expressing hand" position and signed: "BEFORE". She then flexibly switched into a "listening hand" position. The interaction partner switched his hand position to an "expressing hand" position and signed: "BEFORE WHAT?" and immediately switched into a "listening hand position". Maria then signed: "WALK" and displayed a "stretching her hands up" gesture. At this moment, the communication partner recognised the gesture as repre-

¹⁶ Nelson & Fivush, 2004

¹⁷ Fivush & Reese, 1992

¹⁸ Hoerl & McCormack, 2005

senting an autobiographical memory of the "joint exploration of the tree-trunk tree" experience at the park, that is the bodily tactile memory of his hands over Maria's hands when she was stretching her hands up along the tree-trunk. The communication partner confirmed this gesture by using the same "stretching her hands up" gesture and signed: "YOU THINKING WE WERE TOGETHER BEFORE?" Maria smiled and used the "stretching her hands up" gesture once again (reconstruction process; joint reminiscing).

This example illustrates how the communication partner supported Maria's autobiographical memory and linguistic communication by providing her with an efficient use of an autobiographical memory strategy.

Conclusion

This chapter has briefly presented the cognitive information processing approach to language development and how this applies in the case of tactile representations. It has illustrated that tactile language development in

persons with congenital deafblindness is supported by good cognitive strategies. Such strategies can activate tactile working memory and tactile autobiographical memory by facilitating good conversations in social interaction. Or using more theoretical language: The chapter has illustrated that specific cognitive strategies, such as tactile working memory strategy and tactile autobiographical strategy facilitated through transactions during the social interaction are critical elements that influence tactile language development in persons with congenital deafblindness.

The chapter also highlights that it is the non-deafblind communication partner who must take charge of the communication. He or she should provide the person with congenital deafblindness opportunities to use effective and spontaneous cognitive strategies as a part of social interaction. Furthermore, with these cognitive strategies we can help improve tactile language and support tactile language development in persons with congenital deafblindness.

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References

- Bebko, J.M., & Metcalfe-Haggert, A. (1997).** Deafness, Language Skills, and Rehearsal: A Model for the Development of a Memory Strategy. *The Journal of Deaf Studies and Deaf Education*, 2 (3), 131–139.
- Bliss, I., & Hamalainen, H. (2005).** Different working memory capacity in normal young adults for visual and tactile letter recognition task. *Scandinavian Journal of Psychology*, 46, 247–251.
- Bosman, A. M. T., & Janssen, M. (2017).** Differential relationships between language skills and working memory in Turkish–Dutch and native-Dutch first-graders from low-income families. *Reading and Writing*, 30(9), 1945–1964.
- Dreyfus, D.M., Roe, C.M. & Morris, J.C (2010).** Autobiographical Memory Task in Assessing Dementia. *Arch Neurol*. 2010 July; 67(7): 862–866.
- Engel de Abreu, P.M.S., Gathercole, S.E., & Martin, R. (2011).** Disentangling the relationship between working memory and language: The roles of short-term storage and cognitive control. *Learning and Individual Differences*, 21, (5), 569–574.
- Fivush, R. & Reese, E. (1992).** The social construction of autobiographical memory. In M.A. Conway, D. Rubin, H. Spinnler, & W. Wagenaar (Eds.). *Theoretical perspectives on autobiographical memory*. The Netherlands: Kluwer Academic Publishers.
- Gallace, A., & Spence, C. (2014).** *In touch with the future: The sense of touch from cognitive neuroscience to virtual reality*. Oxford: Oxford University Press
- Gardner, R.S, Vogel, A.T, Mainetti, M., Ascoli, G.A (2012).** Quantitative Measurements of Autobiographical Memory Content. *PLoS ONE*. 7(9), 14–19.
- Gibson, J. & Nicholas, J (2017).** A walk down memory lane: on the relationship between autobiographical memories and outdoor activities. *Journal of Adventure Education and Outdoor Learning*, 18:1, 1–11.
- Hoerl, C. & McCormack, T., (2005).** Joint Reminiscing as Joint Attention to the Past. In Naomi Eilan, Christoph Hoerl, Teresa McCormack, and Johannes Roessler (Eds.) *Joint Attention: Communication and Other Minds: Issues in Philosophy and Psychology*, (p.260–272). Oxford: Oxford University Press.

Janssen, M. J., Riksen-Walraven, J.M.A., & Van Dijk, J.P.M. (2003). Contact: Effects of an intervention program to foster harmonious interactions between deafblind children and their educators. *Journal of Visual Impairment and Blindness*, 97(4), 215-229.

Katus, T., Müller, M. M., & Eimer, M. (2015). Sustained Maintenance of Somatotopic Information in Brain Regions Recruited by Tactile Working Memory. *The Journal of Neuroscience*, 35(4), 1390-1395.

Nelson, K. & Fivush, R. (2004). The Emergence of Autobiographical Memory: A Social Cultural Developmental Theory. *Psychological Review*, Vol. 111, No. 2, 486-511.

Nicholas, J. (2010). From active touch to tactile communication: What's tactile cognition got to do with it? *Faghæfte*. Aalborg: The Danish Resource Centre on Congenital Deafblindness. (Katalog nr. 1278. Aalborg: Materiale-centret)

Nicholas, J., Johannessen, A.M., & van Nunen, T. (2018). Assessing Working Memory in the Tactile Modality: The Tactile Working Memory Scale. Unpublished manuscript.

Rødbroe, I., & Janssen, M. (2006). *Communication and congenital deafblindness I: Congenital deafblindness and the core principles of intervention*. St.Michielsgestel, the Netherlands: VCDBF/Viataal.

Sameroff, A.J., & Fiese, B.H. (2000). Transactional regulation: The developmental ecology of early intervention. In J. P. Shonkoff & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (2nd ed., pp. 135-159). New York: Cambridge University Press.

Wilson, M., & Fox, G. (2007). Working memory for language is not special: Evidence for an articulatory loop for novel stimuli. *Psychonomic Bulletin & Review*, 14, 470-473.

Partners' contribution to language development in a bodily tactile modality

A longitudinal case study from a cultural perspective

CAROLINE LINDSTRÖM

KEYWORDS: LANGUAGE DEVELOPMENT, BODILY TACTILE MODALITY, CONGENITAL DEAFBLINDNESS, TACTILE SIGN LANGUAGE

This chapter is based on a Master thesis¹ called "Contributing to a bodily/tactile language by transforming cultural customs – a case study of partner's² communicative accommodations in socialised praxes based on a bodily tactile modality and its influences on a bodily tactile culture".³ The focus in the thesis was to describe in what ways the communication partner contributes to the language development and how they act together with a person with congenital deafblindness. In this chapter the contribution is described as different bodily tactile strategies by the partner, which have had an impact on the language development for the person with congenital deafblindness.

¹ Lindström, 2017

² Partner is used as a concept to describe an equal relationship between the person with congenital deafblindness and people who support in them in their communication development. A partner can therefore both be related family and professional.

³ Ochs, Salomon & Sterponi, 2005; Ochs & Schieffelin, 1983; Ochs & Schieffelin, 1984; Ochs & Schieffelin, 2012; Schieffelin & Ochs, 1983

A cultural perspective of language development includes both similarities and differences in cultures all over the world, for example the way we interact bodily with children and the influence the bodily interaction has on socialisation and language development.⁴ Children are included in the community in different ways, either by direct communication with others or by overhearing others conversations, and by that they are developing their linguistic capacity.⁵ This cultural perspective also involves the relation between a person with congenital deafblindness and a seeing/hearing partner. The development of communication between them is depending on the partner's ability to transform his/her customs from a hearing/seeing modality into a tactile modality that can be perceived by the person with congenital deafblindness. By doing so they can reach a shared meaning and understanding through a shared modality for communication and contribute in different, but equal, ways. The person with congenital deafblindness contributes with utterances based on bodily tactile perception and the partner contributes with elements from an existing cultural language, i.e. tactile adaptations of visual sign language.⁶ In the recent years the research field within congenital deafblindness has investigated the expressions that emerge from people with congenital deafblindness and thereby focusing on bodily movement and gestures from persons with congenital deafblindness in a language development

perspective. The focus of this case study is therefore from a partner perspective to unfold more knowledge how the partners are contributing to the co-creation of a bodily tactile language. The following text describes examples from the case study, which illustrates the development for the person with congenital deafblindness over a period of time, from childhood to adulthood. The longitudinal perspective demonstrates different bodily tactile strategies that have been used by the partner over the years to support language development and a form for conversation. The different strategies can be seen as cultural influences in their shared bodily tactile communication. Read more about strategies for language development in chapter 13 on Tactile cognition and language development.

Case study

The case study is about a young man, Martin, and ten of his communication partners who have worked with him in different periods during the years.⁷ Martin was born in 1999, he is a curious and active young man who likes to engage in new activities, be outside and be a part of a social context. He has a severe visual and hearing impairment, so-called congenital deafblindness. He can detect visual contrasts and shadows. In 2004 he got cochlear implants which he has used on a regular basis through childhood. He also has a condition that affects his muscles for which the use of a wheelchair is now necessary. He uses tactile



For Martin and his partners, these different bodily positions have looked different over the years and have been dependent on his physical ability to sit up for himself and has also supported the development of being part of a tactile conversation form through talking and listening hands.

signs and expressions, body language, gestures, own expressions, sounds, mimic and actions to communicate with his partners. His communication partners have used, and are using, a combination of tactile sign language, Martin's own expressions, tactile symbols and sounds when communicating with him. However, the main focus in the communication is touch based.

The case study is based on nine different film clips with Martin and his partners from the year 2004-2017, which means that there are small glimpses in his life between the ages of four and 18. The case study describes Martin's linguistic development using images and captions describing the partner's support over the years. The text below is divided into two different headings, which both end with a summary bulleted list with important strategies that the partners have offered and used.

Bodily orientations and development of a tactile conversation form

In cultures all over the world different bodily orientations are used together with children. This means that adults and children use different positions when interacting, for example face to face, having the child in the lap or on the back in a nested position or be side-by-side.⁸ These bodily positions also have an impact on how we can communicate with each other in a bodily tactile modality. For Martin and his partners, these different bodily positions have looked different over the years and have been dependent on his physical ability to sit up for himself and has also supported the development of being part of a tactile conversation form through talking and listening hands.⁹

⁴ Schieffelin & Ochs, 1986; Lundquist, 2012

⁵ Hart, 2010

⁶ Arman, 2009; Ask Larsen, 2003; Brede, 2008; Dammeyer, Nielsen, Strøm, Hendar and Eiríksdóttir, 2015; Forsgren, 2016; Nafstad & Daelman, 2017; Wolthuis, 2012

⁷ A fictitious name, Martin, has been given to the young man in this study in respect of confidentiality. All pictures in this chapter are from the original thesis and they are de-identified as much as possible.

⁸ Ochs et al, 2005

⁹ Talking and listening hands is a term used to explain a form of conversation in tactile form. This means that the person who talks tactile holds his hands beneath, and the listener holds his hands on top of the speaker's (Miles, 2003; Mesch, 1998).

Bodily orientations and development of a tactile conversation form



To be able to participate in the communication

At this time, talking and listening hands are not established between them, but his teacher supports the development of such a conversation form by offering Martin to be the speaker and the listener. She does this by gently placing her hand under or on his to tell him that she wants to listen to what he has to say and give him turn in the conversation. Physical/tactile communication happens here simultaneously with speech to Martin.



Equal height

Talking and listening hands are now established between them and they take turns talking and listening in a tactile conversation form. Martin's teacher makes sure that he can understand what they are communicating about by signing clearly, changing the direction of the hands so that he can more easily perceive hand shape, exaggerates movements and gives him time for processing.



Bodily tactile with two persons at the same time

Martin in blue shirt and two of his teachers. He sits opposite one teacher whom he also has direct contact with. A little beside it is another person. Martin's teacher, with whom he has direct contact, shows that there is a person sitting next to them by guiding Martin's hand tactilely touching the other person together. In this way, the teacher supports Martin to get an idea of and be able to relate to other people who are in the periphery. In the picture to the right we see how Martin, by having these prerequisites for a social context before, can now be included in a multi-party conversation in tactile form where he is in direct contact bodily tactile with two persons at the same time.





Martin sits side by side between two people, which facilitates contact and communication. He is thus included in social contexts with several people as a natural part of everyday life. He can be part of a tactile conversation with his left hand while he is taking part in drinking hot chocolate with his right hand. All persons sit close together and have bodily tactile contact with several parts of the body.

Summary strategies that the partners have used together with Martin to support language development:

- Various body positions together have been offered over the years based on Martin's physical ability.
- Opportunities to listen and talk tactilely have been offered when he was little.
- Different positions with talking and listening hands have been used as continued development.
- Partners in the periphery have been announced through tactile contact.
- A wider social and communicative context has been offered through multi-party conversation in a tactile form.

From creative bodily tactile interaction to conventional tactile sign language

In this case study, it was clear that the development of a tactile conversation form and the use of conventional tactile sign language were preceded by a crea-

tive approach to bodily tactile interaction and communication. The creativity consisted of the way in which the partner used both her and Martin's body in communication, and that it was an important element to give Martin prerequisites for linguistic development.

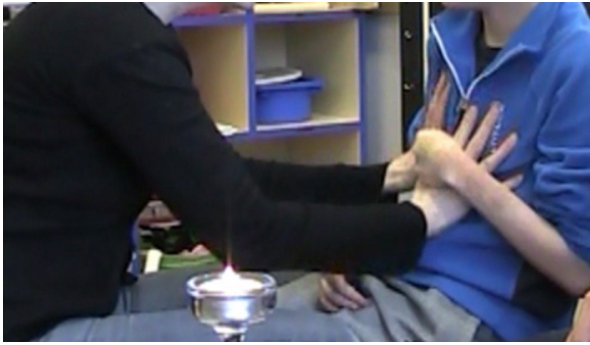
From creative bodily tactile interaction to conventional tactile sign language



Here Martin is six years. He lies on a red carpet with his teacher close beside him. They communicate about a shoe that is nearby on another person's foot. They have made this a playful narrative situation that involves many emotional expressions where they take the shoe off the foot. Martin's teacher emotionally confirms him closely with the whole body and she adds linguistic input by conventional signs for take and shoe. She is creatively placing the signs in different places on Martin's legs.

Here Martin is six years. The teacher uses different rhythms in the interaction with Martin by in this situation clapping against his legs while they sing songs. The rhythms are varied tactically by the way she claps, for example, with her entire hand or with just one finger.





Here Martin is 13 years. He knows a conventional sign language, but the way in which the teacher and he use their bodies is based on a creative bodily tactile approach. On the left picture she signs jersey on Martin's body and perspective instead of placing the sign on her own body as in a conventional tactile sign language. On the right picture both bodies are used simultaneously to sign and communicate about Martin's personal sign.

Here Martin is 18 years old. He sits next to his assistant and they communicate about the massage oil that is on the table and the upcoming hand massage that he will get. Here, Martin knows tactile sign language in conventional form and reads the language with one hand (the sign for nice) while exploring the massage bottle tactile together.



Summary strategies that the partner has used together with Martin to support language development:

- Visual signs have been made available to Martin by adapting them to a bodily tactile form.
- The partner has assumed a creative approach to how they placed signs on Martin's body in communication with him.
- The choice of signs has been based on Martin's interest.
- A narrative style has been used in communication.
- The whole body has been the starting point to enhance emotions.
- Repetitions and variations of signs has been offered.
- Different pace and variations of rhythms in a bodily tactile form have been offered.

Conclusion

From a longitudinal perspective, the partner uses more creative strategies before talking and listening hands are established. After that, their main modality for communication transitions to a conventional tactile sign language. This means that the partner has based the communication on communicative strategies in a bodily tactile form that has changed over time depending on where Martin has been in his development. The conclusion for this is that it is important to have

different strategies and working methods during different phases of life in order for the person with congenital deafblindness to achieve the best possible development. Furthermore, from a cultural perspective, with different bodily orientations and necessary transformation from visual sign language to tactile, it is always the partner's responsibility to find ways in which both persons can meet in interaction and communication on equal terms based on prerequisites and preferences.

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References

Arman, K. (2009). A Child Tries to Make Sense of the World (unpublished Master thesis). Groningen: University of Groningen.

Ask, Larsen, F. (2003). The washing-smooth hole-fish and other findings of semantic potential and negotiation strategies in conversation with congenitally deafblind children (unpublished Master thesis). Aarhus universitet, Denmark.

Brede, K.S. (2008). Let me join your attention. A Sign Language Perspective on the Communicative Togetherness with a Child who is Congenitally Deafblind (unpublished Master thesis). Groningen: University of Groningen.

Dammeyer, J., Nielsen, A., Strøm, E., Hendar, O., & Eiríksdóttir, V. K. (2015). A Case Study of Tactile Language and its Possible Structure: A Tentative Outline to Study Tactile Language Systems among Children with Congenital Deafblindness. *Communication Disorders, Deaf Studies & Hearing Aids*, 3(2),

Lundqvist, E.K. (2012). Rethinking interactional practices in the tactile modality. A comparison between two-party and three-party interaction with persons with Congenital deafblindness (unpublished Master thesis) Groningen: University of Groningen.

Forsgren, G. (2016). The emerge of sign constructions based on heightened tactile Perception (unpublished Master thesis). Groningen: University of Groningen.

Hart, P. (2010). Moving beyond the common touchpoint. Discovering language with congenitally deafblind people. (Doctoral study). Dundee: University of Dundee.

Lindström, C. (2017). Contributing to a bodily/tactile language by transforming cultural customs. A case study of Partners Communicative Accommodations in Socialised Praxis based on a Bodily/Tactile Modality and its Influences on a Bodily/Tactile Culture (unpublished Master thesis). Groningen: University of Groningen.

Miles, B. (2003). *Talking the Language of the Hands to the Hands*. DB-link. Voice: (800) 438-9376.

Mesch, J. (1998). Teckenspråk i taktill form: turtagning och frågor i dövblindas samtal på teckenspråk. (Doctoral study). Stockholm: Stockholms universitet.

Nafstad, V.A., & Daelman, M. (2017). Excursions into the Richness of Human Communication: Theory and practice during and before the 10 years of the International Master program on Communication and Congenital deafblindness. *Journal of deafblind studies on communication*. 3 (1),

Ochs, E., & Schieffelin, B.B. (1983). *Acquiring conversational competence*. London: Routledge & Kegan Paul.

Ochs, E., & Schieffelin, B.B. (1984). Language acquisition and socialization: Three developmental stories. In A.R. Shweder, & R.A LeVine. (Eds.) *Culture theory: Essays on mind, self, and emotion*. 276–320. Cambridge, UK: Cambridge Univ. Press.

Ochs, E., Solomon, O., & Sterponi, L. (2005). Limitations and transformations of habitus in Child-Directed Communication. *Discourse studies*, 7(4–5), 547–583.

Ochs, E., & Schieffelin, B. (2012). The theory of language socialization. In A. Duranti, E. Ochs, & B. Schieffelin. (Eds.). *The handbook of language socialization*. Wiley- Blackwell publication.

Schieffelin, B.B., & Ochs, E. (1983). A cultural perspective on the transition from prelinguistic to linguistic communication. In M.R Golinkoff. (Ed.) *The transition from prelinguistic to linguistic communication*. New Jersey: Lawrence Erlbaum Associates Inc. Publishers

Schieffelin, B. B., & Ochs, E. (1986). Language Socialization. *Annual reviews Anthropol*, 15, 163-191.

Wolthuis, K. (2012). Language acquisition by touch. An Analysis of the Language Acquisition Process of a Child with Congenital Deafblindness Phonology, Lexicon and Morphosyntax (unpublished Master thesis). Groningen: University of Groningen.

When Trine says GRANDMA ...

What is on her mind?

KARI SCHJØLL BREDE

KEYWORDS: LANGUAGE DEVELOPMENT, MEANING-MAKING, OVER-EXTENSION, CATEGORIZATION, DECLARATIVE COMMUNICATION.

This chapter is about how a child with congenital deafblindness explores her language to find a sign describing a thought for which she has not yet created a linguistic concept. It is in conversation with others that children develop their language, and that is where – in the exchange of signs and emotions – meaning is created.

The language development of children with dual sensory loss is a laborious but exciting process. How are the children's own thoughts expressed? When their thoughts are expressed, how do we interpret the meaning of the expressions? We know that it is important to negotiate signs to create a shared meaning, to try to ensure that we are talking about the same thing. Many people choose to create dictionaries with images or videos of signs, with an explanation or definition alongside them. This can be a good strategy with clear learning goals in a world where goals and goal achievement are assessed constantly. However, if meaning-making and language development are the goals, is this still the best method? Arman¹ shows that this is not the case in a study in which Felix signs jam and porridge, referring to his experiences with cold and hot.

In this chapter, I will describe a case in which it may be wrong to attach a definition to the sign. In a dialogical² way of thinking, meaning is created between us as communicators. Once we think we have a common understanding of a sign³, can we as partners conclude and believe that we have and will continue to have a common understanding? In children with congenital deafblindness we often see a gap between their vocabularies and their cognitive skills. This leads to the supposition that the signs can represent a different and broader meaning than the lexically and culturally defined meanings. It might even mean something else in this

new context than that which I thought we had "agreed" on the last time we used the sign.

Trine's conditions for language – and a challenge

Some years ago, I attended a course of study in Trondheim: Meaning-making and tactile sign language. My daughter, Trine, was 16 years old at that time, with a severe hearing loss (75-90 db) and a severe vision loss. I thought I had learned a lot both about sign language and about language development for children with deafblindness. I was learning theories about meaning-making. Then Trine presented me with a challenge, and I had to wonder for quite some time before she had the opportunity to show me the explanation.

Trine has Rubinstein Taiby syndrome. At age 16 she had a good repertoire of signs and meaningful gestures. Yet her cognitive function and understanding of others' use of language was considerably better than what she could express herself. This is typical of people with her rare syndrome. She also performed the signs imprecisely due to motor difficulties, so it was important that her communicators knew her well enough to perceive her signs. Trine had great support from her hearing aids, and she enjoyed using them. She used her hearing function all the time to follow what was happening in the outside world, such as doors slamming, motorcycles accelerating etc. She often visualised these sound impressions

¹ Arman, 2009

² Linell, 1998; Markova, 2008.

³ From now on signs, gestures and bodily expressions are defined as signs; the child's language.

with signs as she repeated the sound. The vowels and rhythm of spoken language were a great support to her in conversations where words and signs was used simultaneously. For her to sense and perceive what communication partners said, they had to sign within her field of vision at a slow speed, often with tactile support by her holding the conversation partner's hands. The combination of tactile signs and vocalisation ensured attention and interest. She also enjoyed listening to music as a leisure activity.

What challenged me was Trine signing GRANDMA in a context in which I could not understand her meaning. She signed GRANDMA supported by vocal expression, and with great enthusiasm in body language and intonation. My first impression was to interpret the expression as something she wanted; "I want to see GRANDMA" and to answer by saying we are not seeing her today. Then I chose to interpret it as a desire to talk about grandma. However, my attempt to continue the dialogue with her about grandma was broken, and she lost interest in my answers. They were not good enough. I didn't understand her, and she realized I didn't understand. I had to ask myself: "When Trine says GRANDMA in this context, what is on her mind?"



if she was coming. She "called" grandma with her voice and signing. This meant that she could use the sign in contexts where we joined in a common understanding and meaning. But in this new situation, this did not happen. In this new, interrupted dialogue, we were at home in our own living room. Trine was listening to music through the loop – children's music and ABBA were her favourites – while leafing through a picture book.

I interpreted her utterance as a declarative one with the intention of talking about grandma. They had a close and warm relationship. Therefore, I tried to answer and suggest: GRANDMA NICE, GRANDMA GO SKIING, WAIT GRANDMA point (you)? or GRANDMA VISITING? But those and several other attempts to figure out what she was thinking of were rejected, and the dialogue was broken.

I thought we had coincidental cognitive schemas for what grandma was as a person, and what she represented. Usually, when I told her grandma would visit us, she went to the door and opened it to see

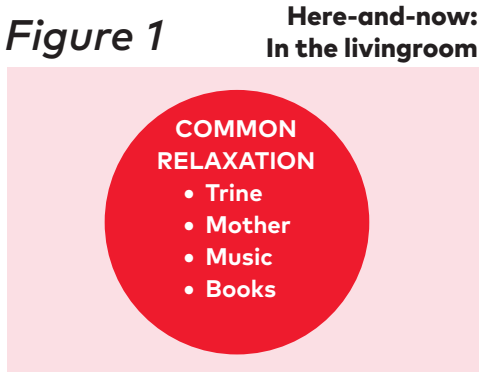


An initial dialogue

A few days later, Trine was again signing GRANDMA to herself several times, repeating to herself. There was loud music in the room that day and the loop was not in use so I could also hear the music. I sat down facing and framing her, so she could both see and feel me. Then she repeated "Grandma" using her voice this time. I answered her by repeating GRANDMA through signing and vocalisation. Trine confirmed, smiling, but as I continued with GRANDMA VISIT, and then GRANDMA NICE? She "disappeared" from the dialogue by leaning forward. I have created a model for what happened so far in this incident⁴, figuring out where and why the dialogue was broken:

What happens when we don't understand each other?

Trine and I were at home in the living room, in an everyday situation reading books listening to music. Our common world and our common understanding of focus was relaxation and might look like this:



⁴ Ask Larsen, 2004.

When Trine suddenly signed GRANDMA, first addressed to herself, then also addressed to me, the situation changed. It opened my cognitive schema for GRANDMA. It has a rich content, limited to what I expected to be a common memory for Trine and me about grandma in activities such as ski-trips, visits, good food, as well as fun and hugs are elements that were part of our common memory. Yet Trine had another item, another reference to grandma that I was not aware of. I couldn't understand her.

What does it mean to be able to express a word? A word consists of both form and

content.⁵ In this situation the form was clear. She said GRANDMA and I understood the expression. But the content, the meaning of the word in this context, was not clear to me. It was related to here-and-now, yet I had not found out what she was referring to. This is called overextension in early language development. The child uses a word that refers to something that is unusual in the adult use of the word. I didn't understand what she was referring to. Her statement about grandma had no relevance to me in the here-and-now situation (figure 3). Trine realised that I didn't understand and gave up.

⁵ Bueie, 2014.

Figure 2

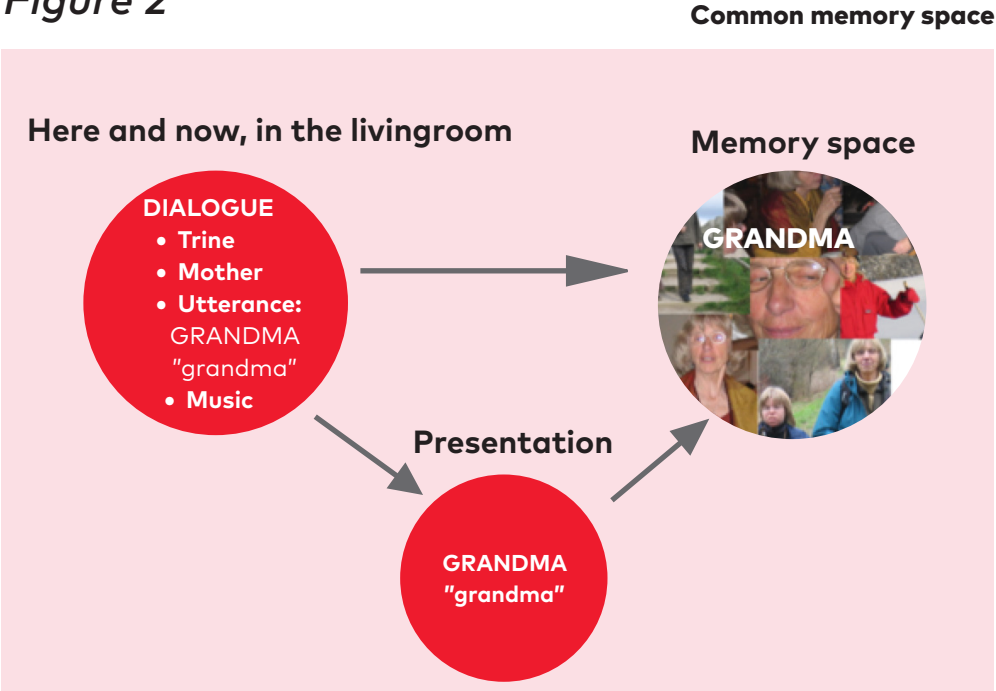
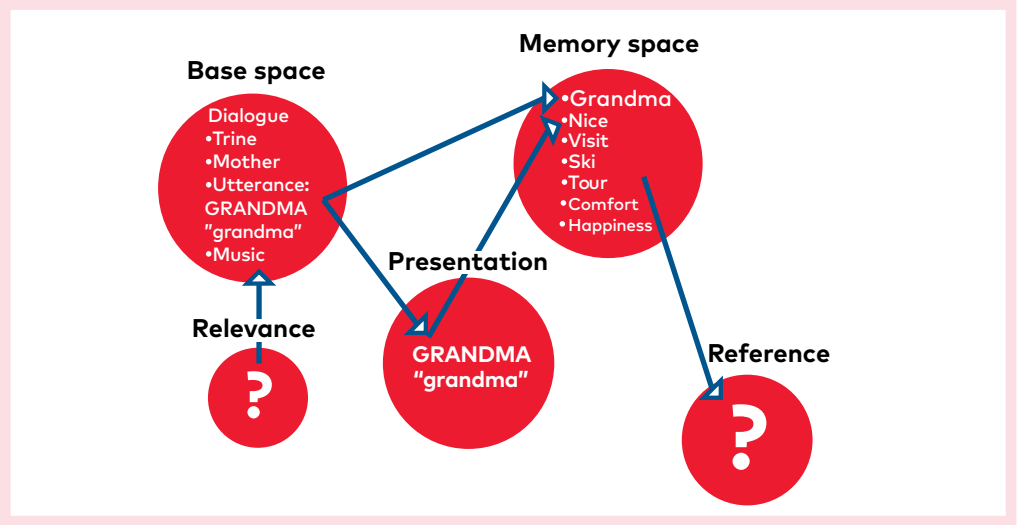


Figure 3

Broken dialogue



What happens when we do understand each other?

"The fewer forms of expression a child has, the more important it is that we emphasise transferring the knowledge we have about the child's experiences to the child's different environments. At the same time, there is a great demand for our ability to see contexts".⁶ Trine knew many signs and ways to express herself yet lacked a store of signs and ways to describe experiences and impressions. Therefore, it is important to think as Holmen described: great demand is placed on our ability to see contexts. Trine and grandma had many shared experiences and joys. Was there anything in the here-and-now situation that could show me a new meaning of the sign GRANDMA?

Then suddenly I became aware of the music in the room. This music was not

what Trine usually listen to. There was classical music with violin, flute and piano in the air when Trine said GRANDMA. Trine listened mostly to children's music and pop music, directly through hearing aids and a loop.

I realised that this music, playing in the room, is always playing out loud in grandmother's home. I could now assume that Trine had heard classical music every time I misunderstood her utterances with reference to grandma.

My attempt to talk about grandma was rejected, but my new attempt was talking about the music we listened to. I tried a new dialogue on what GRANDMA is. When I asked if it was GRANDMA MUSIC she was thinking about, the response was, in my opinion, unambiguous.

⁶ Holmen, 1996.

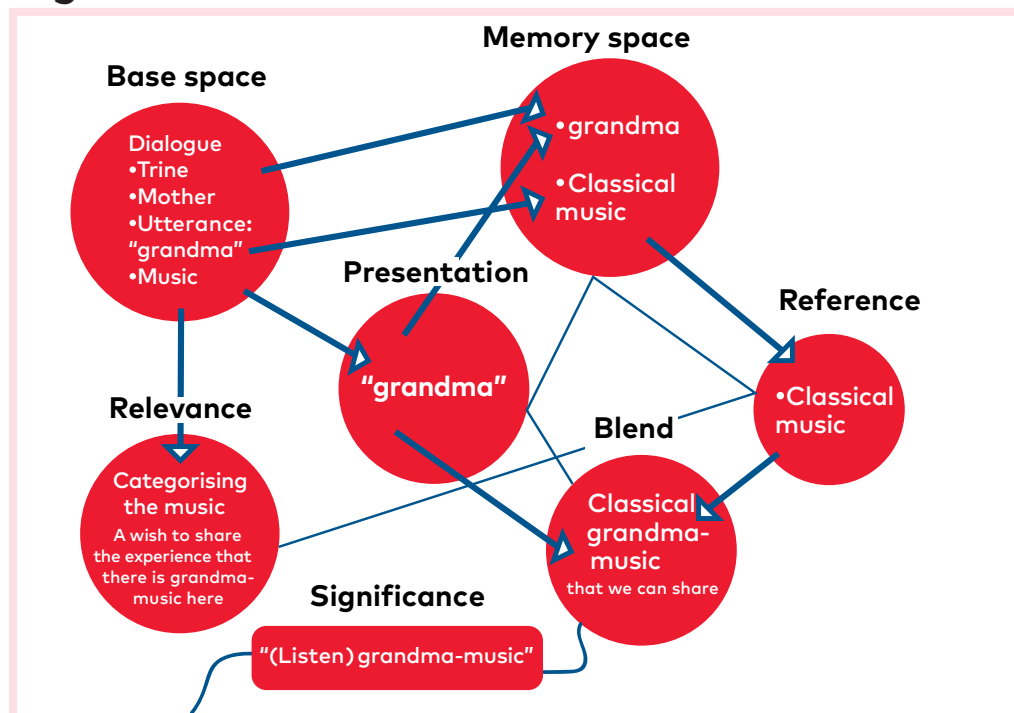


A vocalised "yes" followed by a big smile, she straightened her back and the dialogue between us continued about the rhythm and instruments with shared attention to the music, with fingers playing piano, movements for violin etc. After a while Trine was finished talking about the music, she turned around leaning her back to my stomach so we could continue sharing the music experience.

The model in Figure 4 shows how the shared understanding was constructed in the situation:

Trine categorised this type of music as grandma's music. She wanted to share the experience of the music, talk about what kind of music it was, unlike the music she usually listened to. As I finally understood the meaning, the model shows that "here-and-now" changes and becomes

Figure 4 A new understanding



clearer. My experience has been that we relaxed with books and music until Trine declared what kind of music it was. The fact that we were listening to classical music made the mental focus clear. Then the presentation, the sign GRANDMA was relevant; a desire to share that this is music in a "grandma-way". This gave me a reference that matched the situation, which allowed us to achieve a new shared meaning. We were given the opportunity to continue the dialogue about the music.

The moment when I realised the meaning of GRANDMA in this situation is one of life's golden moments. Trine didn't want to influence anything, and she wasn't asking for anything. She wanted to share the experience with me. She used declarative – narrative – communication. Something arose between us and we created a reality together, a place to share the music. It was her language and our dialogue that brought us there. "To use language is to make sense, but the meaning is not in the language itself. It is the communication situation, the context, that makes sense of the utterances," said Svennevig.⁷ In order to explain to the reader what had happened, use of the Six-space model⁸ is appropriate. It is easier to understand where and why it was difficult to find an answer, and the model shows the mechanisms needed for the meaning-making to take place.

Consequences

This episode about the search for a meaning of a sign has taught me a lot. Something happened to my way of answering Trine. What is even better is that our way of talking has changed. Even her teachers and other

Something arose between us and we created a reality together, a place to share the music. It was her language and our dialogue that brought us there.

communicators with a close relationship to her became involved in Trine's way of categorising the music. Their reactions and answers support Trine in her awareness and development of language. After Trine began using her own expression GRANDMA for the "classical music" category, much has happened in her awareness of music and her ability to find concepts that help her in communication – probably also in her own thoughts about music.

She became competent in talking about something that interested her, meaning she gained the knowledge to talk about something; language is not just about giving a command, or asking for something. This has made her more competent when talking about other things too - and better at listening to her communicators.

We know that language development in children with sensory loss is vulnerable. The utterance GRANDMA succeeded this time. It was because Trine herself did not give up, and because I as a mother had gained useful knowledge through education. It was also because Trine had a solid and stable network of people who had a professional relationship with her. Several persons knew her story and development, and they shared their knowledge. Together we could build on what Trine herself had started.

⁷ Svennevig, 2001.

⁸ Ask Larsen, 2004.

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References

Arman, K. (2009). How a child makes sense of the word. (Unpublished Master thesis). Groninge, University of Groningen.

Ask Larsen, Flemming (2004). Om at forstå ting, der er vanskelige at forstå. Døvblinde-Nyt nr 1. 2004

Bueie, A. (2014). *Arbeid med grunnleggende norsk: begrepslæring og tilpasning*. Høyskolen i Burskerud og Vestfold, N.

Holmen, Liv (1996). *Viljen og lyset*. Et døvblindfødt barns utvikling. Nordisk vejleder nr. 19, NUD, DK

Linell, P. (1998). *Approaching dialogue: Talk, interaction and contexts in a dialogical perspective*; John Benjamins Publishing Company, Amsterdam, NL

Marková, I. (2008). Dialogicality: Keynotes speech from the Leeds Conference: *Co-creating Communication with persons with deafblindness.*, UK.

Svennevig, (2001). *Språklig samhandling – en innføring i kommunikasjons-teori og diskursanalyse*. Cappelen Akademisk Forlag, N.

Apple Trees and Horse Bus – Conversation through bodily and mimetic utterances

HELLE BUELUND SELLING

KEYWORDS: MIMETIC UTTERANCES, RECONSTRUCTING EXPERIENCES, CO-CREATION AND NEGOTIATING JOINT MEANING

In this chapter, I examine mimetic utterances in dialogues. In this context, mimetic utterances are understood as action-imitating embodied utterances that refer to a specific episode by imitating what the communication partners did and how they acted. The chapter is based on two case studies in which the persons with congenital deafblindness and their communication partners are in dialogue about recent experiences. In both case studies, the deafblind communication partner presents a mimetic gesture that is negotiated and assigned a linguistic value in the dialogue. These mimetic gestures are recognised by the seeing and hearing communication partners as utterances that have the potential to develop, and be co-created into, conventional signs. Both communication partners shared their findings with the networks of the persons with deafblindness. This knowledge sharing supported the conclusion that the mimetic utterances are recognised, responded to and given a linguistic value. The chapter summarises the various methods used by the communication partners to stimulate and support the development and stability of the conversations.

Conversation about picking apples

In the first case, we meet Lisa and her communication partner Susan.¹ Lisa has congenital Rubella syndrome, she is functionally deaf and has a progressive vision impairment, which means she can see the outline of people or things in motion at a distance of up to two meters. Lisa uses a few conventional signs from Danish Sign Language (DSL) supplemented by various bodily utterances. Lisa reads and understands more conventional signs than she spontaneously uses herself. She reads the signs visually with tactile support, hand over hand.

The story about Lisa and Susan takes place one afternoon, when they are preparing afternoon tea together in the kitchen. Suddenly, Lisa places herself very closely to Susan, body against body, then stretches, and reaches her right hand above her head. She seems to be very insistent and Susan takes a step backwards as Lisa's tactile utterances occasionally are quite rough. However, Lisa has a very open attitude and Susan chooses to step back into the first position, so she can meet Lisa's initiative in a friendly and open-hearted manner.

Even though Susan recognises Lisa's gestures as utterances, she does not understand what Lisa is trying to tell her and the negotiation of co-constructing meaning starts. In her first attempt, Susan interprets the stretch as a pointing gesture referring to something in the here and now in the preparation of afternoon tea. She wonders if Lisa is suggesting they should use some special china placed on the top shelf. Alternatively, could she be referring to the cakes on the top shelf in another cupboard? Lisa rejects Susan's



suggestions by leaning towards Susan and stretching up, now on tiptoe and with even more tension. Susan interprets Lisa's eagerness in reaching up as 'no, I am not talking about either the china or the cakes'.

Susan strives to meet Lisa, and changes strategy, choosing to interpret Lisa's gestures and movements as mimetic utterances. Susan assumes that Lisa is telling a story about a joint activity by using the same gestures and movements as were used in the actual situation. She starts to recall different situations they have experienced together; situations where they were stretching towards something. She notices that Lisa shapes her hand as if she is holding something

round. Then it occurs to Susan that they were out picking apples together some time ago. Lisa beams when Susan joins her stretch and together, they "pick" imaginary apples and put them into an imaginary basket. Then Lisa takes a small break, as if she needs to reflect on Susan's recognition of her intentions and utterances, before she stretches again, now leaning more towards Susan. Susan picks the imaginary apples and they talk about picking apples hand-over-hand in a tactile modality. Together they refine the little twist with the hand that makes the apple loosen from the tree and Susan introduces the conventional DSL sign for apple and then helps Lisa to form the handshape for the sign for apple. Then Lisa senses with her right hand over Susan's left hand how Susan takes a bite of the imaginary apple and chews while Lisa touches Susan's cheek with her left hand and smiles to herself.

Once again, Lisa stretches herself towards the "apples above them", but this time with more intensity. In the same move, she leans towards Susan, and Susan understands that Lisa has more on her mind that she wants to share. In order to be able to respond to Lisa's utterance, Susan needs to recall the situation at the apple tree. This time Susan does not pay attention to the direction of the stretch but rather to the intensity with which Lisa leans herself towards Susan. As Susan recalls the situation, they were not positioned body against body but side-by-side when picking the apples, and Lisa used the tree for support to keep her balance while reaching for the apples. Thus, in her story about picking apples, Lisa gives Susan the position

of the tree, and this position as well as Lisa's round handshape contributes to four different levels in understanding the mimetic utterance: (1) Context markers² or clues for how to interpret the meanings embedded in the mimetic utterances. (2) References to the tree as an elaboration on the story: *When we picked apples, I needed the tree to keep my balance*. The manner Lisa leans towards Susan is a mimetic utterance based on her memory of how the tree helped her keep her balance when she was picking the apples. (3) The handshape used when picking the imaginary apples reflects the tactile iconicity³ of the real apple she picked. When picking apples, the shape of the apples in the hand left a trace in her memory, and now she can make a sign based on this bodily trace: 'apple'. (4) A combination of all the embedded meanings above give the story about picking apples more complexity and add a range of details. Lisa's linguistic construction is complex, and it tells us something about her cognition and her ability to structure and compose her narratives using many linguistic elements.

A conversation about horseback riding

Johan and his special educator and communication partner Lotte are sitting very close together on a sofa talking about horseback riding. Johan is a young man with a moderate to severe hearing loss of 30dB and 70dB, respectively. His field of vision is restricted; he has a severe cast in both eyes and primarily uses his left eye to focus. Johan sees things in motion, but they appear blurry and he needs his glasses and a distance of only 10-15 cm to be able to see any details. In

¹ Lisa and Susan are anonymised.

² Bateson, 1972

³ Forsgren, 2016



Photo roll 1: Presentation of the photos

communication, Johan needs his communication partners to use tactile signs and tactile pointing gestures to support verbal language.

Sitting together in a sofa very close to each other, leg against leg with Johan leaning towards Lotte and with Lotte's arm around Johan's shoulders, the partners create a stable bodily framework for Johan, one that relieves and supports Johan's body so that he has the energy to communicate.

The communication between them flows within two parallel levels or themes. The primary theme is about Johan horseback riding. The secondary and underlying theme deals with the relation on a psychological level: maintaining contact and reciprocating mutual trust. Here we find both regulation of emotions and reciprocity through talking about the same issue. The secondary theme is present

during the whole conversation about horseback riding, and Lotte and Johan repeat and confirm to one another that they are sitting together, that they have a nice, safe relation and that they enjoy being together. Through the emotional attunement, Lotte supports Johan's agency (here understood as Johan's ability and willingness to communicate and act) and thus helps Johan to experience being an interesting communication partner who has a story worth sharing and telling others about.

Lotte initiates the conversation by showing Johan a photograph of Johan horseback riding. Lotte uses the photo as a context marker to guide Johan towards a common theme for them to talk about, and then she provides time and space for Johan, so he gets the opportunity to explore the photo before turning to Lotte and waving the picture with a great smile. Through eye contact, smiles and laughs



Photo roll 2: Johan's mimetic utterances in a "riding manner".

Johan both stabilises their relation and accepts Lotte's suggestion to talk about horseback riding. Then Lotte shows him more photos and he reaches out to get a new one.

Once again, Johan explores the picture for a while before turning towards Lotte and talks about horseback riding by jumping in a way that imitates the rhythm and embodied perception of sitting on a horse.

He uses an action-imitating gesture – a mimetic utterance to tell about his experience – and Lotte responds by imitating his bodily gestures while she points at the

photo and verbalises 'yes, you are horseback riding'. In this exchange, Lotte recognises Johan's gestures as mimetic utterances and values these as language. The gestures emerge in the current conversation and therefore Lotte starts to stabilise and reinforce Johan's contribution to the conversation in order to elaborate on the mimetic utterance and to co-create meaning. Through the co-creation of meaning it is possible to keep and transform Johan's mimetic utterances into a negotiated sign for horseback riding – here 'sign' is understood as a semiotic sign and not a conventional sign from the Danish Sign Language. To reinforce



Photo roll 3: Johan recycles his riding gesture and laughs.

the sign, Lotte invites Johan into a joint recycling of the riding gesture while she verbalises '*riding, riding, riding, yes Johan, you are horseback riding*'. Then Johan looks at the photo, turns back to Lotte and makes a riding gesture and laughs (the laugh sounds like a horse neighing). Lotte responds with an '*ihhaa*', as if she were a horse neighing.

In the same action-imitating manner, they talk about how Johan stroked/patted the horse: Johan's left arm rests in Lotte's right hand and Lotte strokes/pats Johan's arm with her left hand, as if Johan's arm was the horse. In this manner, Johan's arm gets the I-position as the horse and Lotte takes the I-position of Johan patting and stroking the horse, saying '*nice little horse*'. Johan looks very interested, smiles and glances

towards Lotte and back to the "horse". By taking the I-position as Johan, Lotte emphasises Johan's experience with the horse as an experience that is worth sharing and talking about.

After returning to looking at the photo together, Lotte changes focus by pointing at another person in the photo and turns Johan's attention towards a man (the riding therapist) sitting on the horse behind Johan. Lotte adjusts her position a little, and Johan leans forward so Lotte can pat in a pointing manner on his back: '*the man sat here behind you*'. Afterwards she introduces the sign from DSL for 'man'. First, she presents the sign in Johan's field of vision and secondly at his forehead which is the conventional location for articulating the sign '*man*'.



Photo roll 4: Lotte introduces the sign 'man' to Johan.



Photo roll 5: Lotte introduces the sign for horseback riding hand-over-hand in a "jumping manner".

Then, Lotte changes her position so that she is facing Johan. She takes his hands and hand-over-hand introduces the conventional sign '*horseback riding*' to Johan. He follows with interest and together they sign '*horseback riding*' several times – up down, up down in a jumping manner in big rhythmic movements similar to Johan's mimetic utterance for horseback riding, while Lotte verbalises '*riding, riding, riding*'.

The big rhythmic movements imitate Johan's mimetic utterance for horseback riding and help enlarge and sustain the horseback riding sign for Johan. In other words, Lotte blends⁴ Johan's mimetic utterance with the conventional sign for horseback riding and thus reinforces a joint understanding of talking about Johan horseback riding.

⁴ Blending derives from cognitive linguistics and describes a linguistic process in which two semiotic entities or signs blend to form a new meaning or reinforce the meaning of a given sign. Ask Larsen, 2003



Photo roll 6: The man sat here.



Next, Lotte creates a sentence for Johan and tells him in both DSL and verbally that Johan is horseback riding with the man in the picture. She moves her hand back to Johan's back and pats it saying, 'sat here'. When Lotte includes the tactile pat on Johan's back, she supports and sustains the bodily traces the physical contact between Johan and the riding therapist has left in Johan.

Recycling the riding gesture in different ways stabilises Johan's story about horseback riding. Lotte supports the story by using photos, imitating his mimetic utterances, shifting between positions and introducing Johan to conventional signs. All the elements not only enlarge the horseback riding experience itself but also give Johan the opportunity to talk about it in different ways, for instance: Johan riding the horse, Johan stroking the horse, the riding therapist sitting behind him as physical support for Johan and the bodily traces the experience left in Johan.

In chapter 13, Jude Nicolas describes working with different cognitive strategies that transfer and store memory

traces from the working memory into the autobiographical memory. One of the strategies is to work with recycling and recycling with variation. Another strategy deals with reconstruction of the experience in dialogues. Lotte uses both strategies in the dialogue with Johan. She divides the experience up into small entities, engages and recycles Johan's contributions to the dialogue, and, bit by bit they re- and co-construct Johan's experience about horseback riding. Lotte scaffolds the dialogue and makes sure that they can revisit the experience for a while and talk about all the different entities. She supports and gives Johan's story the opportunity to be a strong and resilient story in his autobiographical memory. This is a story he will be able to share, explore, and elaborate on with other communication partners.

The video film of Lotte and Johan is some years old, and Lotte has told me that Johan still uses the mimetic sign for horseback riding, but that recently he started to combine it with the conventional sign for bus when talking about horseback riding. It is possible that Johan has mapped⁵ the riding gesture with

⁵ Mapping refers to the entities that create mental coherence between different experiences. Souriau, Rødbroe og Janssen, 2008

the bodily experience and perception of sitting in a wheelchair in a driving bus. Some big girths clamp the wheelchair to the bus's restraint system and the wheelchair is a bit wobbly during the ride.

Gøran Forsgren writes in chapter 10 that mimetic signs in combination with a conventional sign illustrate the term active iconicity in sign language linguistics. This means that the mimetic sign shows what the sign language sign refers to. For instance, Johan uses the sign for bus and combines it with his mimetic sign for horseback riding (or how he experiences sitting in a wheelchair in a driving bus). Now the question is whether he is talking about horseback riding, whether he is talking about how the sensory perceptions of riding the bus feel the same way as if he was horseback riding – or is he telling us that he is riding a bus to the stables for horseback riding?

Both Susan and Lotte recognise Lisa and Johan's mimetic utterances as language

and choose to stay in the dialogue and elaborate on it instead of responding with a simple reply like 'yes, you picked apples' or 'yes, you are talking about horseback riding'. Susan uses her knowledge about different types of tactile utterances to test her different interpretations of the first gesture Lisa presented. In addition, she relates the mimetic utterance to their shared memory space⁶ in order to be able to code its references. Lotte helps Johan by scaffolding the conversation and reconstructs the experience bit by bit, adding one component after the other (the photos, shifts of positions, riding the horse, the riding therapist, and patting Johan's arm as if it were the horse and finally introducing the conventional sign for horseback riding). When both communication partners recognise the mimetic gestures as linguistic utterances and imitate the gestures in the dialogue, they support the possibility of elaborating the dialogue and the theme of the conversation can be co-investigated and meaning co-created and co-developed.

⁶ Ask Larsen, 2003

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References

Ask Larsen, F. (2003). The-washing-smooth-hole-fish and other findings of semantic potential and negotiation strategies in conversation with congenitally deafblind children (unpublished Master thesis). Aarhus: University of Aarhus.

Bateson, G. (1972). *Mentale systemers økologi*. København: Akademisk Forlag

Buelund Selling, H. (2013). Taktilkommunikation er mere end tegnsprog hånd over hånd. I Dammeyer, J. og Nielsen, A. (Ed.) *Kropslig og taktil sprogudvikling*. Aalborg: Materialecentret.

Forsgren, J. A. G. C. (2016). The Emergence of Sign Constructions Based on Heightened Tactile Perception. The Proposition of a New Sign Category (unpublished Master thesis). Groningen, University of Groningen.

Nafstad, A.V. (2009). Kommunikation kan kurere: Fokus på kommunikativt agens hos personer med medfødt døvblindhed. *Faghæfte*. Aalborg: Viden-scenter for Døvblindfødte. (Catalogue no 1281, Materialecentret)

Souriau, S., Rødbroe, I. og Janssen, M. (Ed.) (2008). *Kommunikation og medfødt døvblindhed. At skabe mening*. Aalborg: Materialecentret.

Illustrations of Multi-party Communication

SOFI MALMGREN

KEYWORDS: MULTI-PARTY COMMUNICATION, CONGENITAL DEAFBLINDNESS, LANGUAGE DEVELOPMENT, MAKING ONE'S VOICE HEARD, EXTERNAL UNDERSTANDING

Every child, every person, has the right to be their own person with thoughts and opinions that others listen to; likewise, to exist in communicative and social contexts in which they are given the opportunity to express themselves. In this context, multi-party communication plays a major role for both those with congenital deafblindness and their communication partners. This chapter compiles experiences, both practical and theoretical, that I refer to in the text. The chapter describes the importance of existing within a linguistic, communicative environment to meet the above-mentioned human needs and achievement of those rights.

The world we inhabit together with others is a social world in which people create objects and organise their existence. In this world, we may find ourselves in communicative relationships with others in which norms, values, stories, histories and language are exchanged¹. Much of what we share and the way we communicate it, however, is based on visual and auditory experiences and perceptions.

Finding ways for those with congenital deafblindness to share in the world in which we live – with all that entails – so that they are not excluded from society and the community, is a challenge for family and friends and for preschools and schools alike. It demands a tactile approach and a tactile language, which is often corrected and seldom spontaneous. This is mostly so that we the sighted and hearing can understand what we should be doing and how we should be doing it.

There are many variations of bodily tactile language. It is crucial that the communication partner sees the gestures and expressions made by the individual with congenital deafblindness as communicative, and that they respond to these. This is a prerequisite for language development.² Bodily tactile language should be defined as a form of communication in which senses such as touch, smell, taste and body language interplay.³ In order to obtain nuance in tactile language, we also need to consider parameters such as temperature, speed and pressure.⁴

One way to approach a deeper and more

nuanced tactile language is for several individuals to communicate together in a narrative. Multi-party communication can support language development and a deeper conversation that deals with more than simply the here and now. The results demonstrated by multi-party communication approaches and working methods in one school for students with congenital deafblindness include a larger vocabulary of signs and an increased understanding of narratives and of one another. This is what is known in linguistics as pragmatics, that is, the study of how context contributes to meaning. This work has also increased students' ability to make their voices heard, as well as their understanding of the meaning of making themselves heard and expressing their opinions. Participation in and an understanding of their surroundings has increased as the students' voices have been lifted, listened to and responded to.⁵

Multi-party communication

The following is a presentation of multi-party communication and why it is an important element of language development, as well as a few thoughts on and experiences with how it can be put into practice.

What is multi-party communication?

In the specific context of congenital deafblindness, multi-party communication involves several people participating and sharing experiences, perceptions and knowledge with one another through the tactile modality, facilitating the creation of community and social context. This

can be achieved by two of the parties in the dialogue who share a common experience explaining this to a third party. In this dialogue, the person to whom the experience is being related may be familiar with it from previous experience or be entirely unaware of what will be related or discussed. The dialogue will probably have greater meaning for all involved if it revolves around a common experience that is narratively retold or passed on.⁶ This may even be a spontaneous conversation involving several parties.

Multi-party communication, in which the telling and retelling of stories motivates dialogue, is very beneficial and can provide interesting results. Coming together to share one another's communication, body language and feelings tactilely is important for understanding context and surroundings.⁷ We who see and hear do this constantly from infancy. We quite naturally enter a variety of contexts in which multiple people are talking and socialising. For people with congenital deafblindness, it can be more difficult to take part in such contexts on equal terms. We who see and hear do not always make ourselves accessible to those with congenital deafblindness. We generally utilise our remote senses – sight, hearing and smell – rather than a language, approach and attitude that is tactilely accessible.

How does multi-party communication affect language development?

Children and adults who can see and hear take in events going on around them without the need to be directly involved or active, for example in a conversation. By hearing themselves as the subject of

discussion, they can obtain a self-image and naturally find a role as narrator. Those with congenital deafblindness seldom have access to the experience of themselves as a stakeholder without directly participating. They do not have the opportunity to participate in locating a context from a distance; rather, they must be extremely close or tactile.⁸

Communicative partners are a prerequisite for creating communication and context together with persons with congenital deafblindness. It is a challenge both to arouse curiosity about the surrounding world and to make it accessible. The communication partner themselves must be interested and interesting to succeed in engaging the deafblind individual in communication. They must be able to read and follow the individual's self-expression in order to create shared meaning and dialogue. Multi-party communication is one step further in language development; it provides space for a fuller, richer dialogue. To make it possible for a person with congenital deafblindness to participate in multi-party communication, both the individual in question and their communication partners must be tactilely available to one another. Those involved in the situation then can share tactilely communicated expressions, feelings and moods. Without this proximity and tactile interaction, we will not be able to reach one another in the same way.

My own experience of practically implementing multi-party communication has been very positive. Of course, it can be a challenge to identify the method

¹ Bengtsson, 2005
² Dammeyer, 2013
³ Buelund Selling, 2013
⁴ Køppe, 2013
⁵ Jägryd & Malmgren, 2013

⁶ Lundqvist, 2012
⁷ Malmgren, 2014
⁸ Lundqvist, 2012

that suits your own situation, and its complexity should not be underestimated; despite this, it has many positive effects. I have seen how multi-party communication increases empathy as the child comes to understand the importance of both making their own voice heard and listening to others. These dialogues also help to develop an understanding of how to communicate and deal with emotions.⁹

I have also witnessed how external understanding has broadened as the child is able to share others' stories and tell their own. By taking part in a multi-party narrative, the child can gain an understanding that they are someone worthy of being listened to and that what they express is important. This is crucial in building self-esteem and self-belief. Multi-party communication also increases the opportunities for participation in social contexts as an equal.

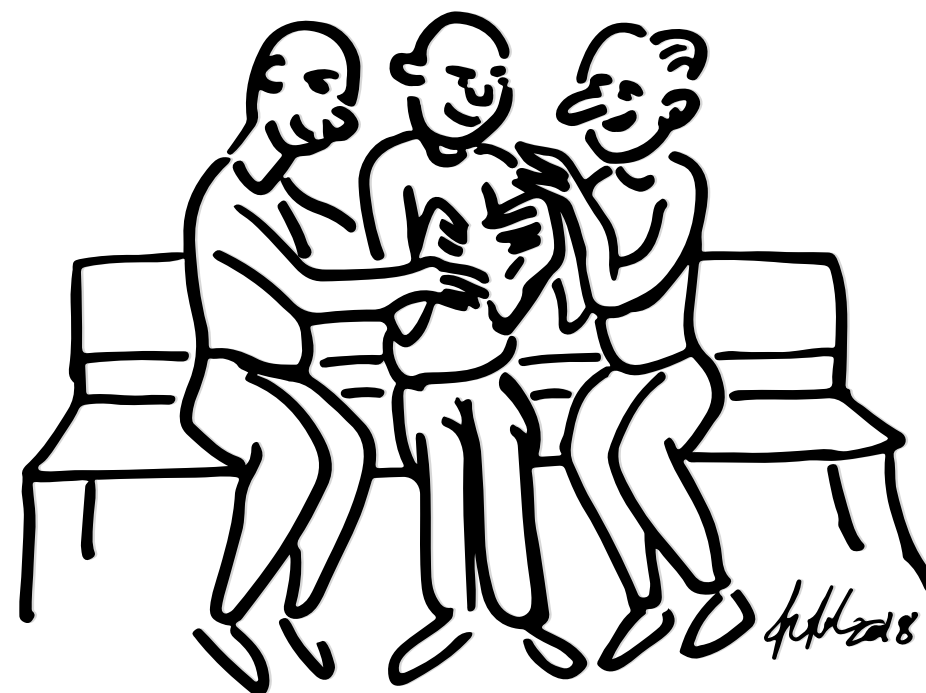
Cognitive and language development also seem to take place more naturally in a multi-party context than during two-way exchanges. Three-way and multi-party communication in the tactile modality provide far richer learning, language development and cultural contexts than two-way communication. The process of creating community and shared meaning, and of agreeing on common signs and gestures, is quicker in multi-party than in two-party communication. Multi-party communication also provides opportunities for overhearing.¹⁰ This has been made abundantly clear to me in encounters and work with multi-party communication. By providing the congenitally deafblind individual with access to tactile list-

// The process of creating community and shared meaning, and of agreeing on common signs and gestures, is quicker in multi-party than in two-party communication.

ning, to overhearing without the need for active participation in a tactile conversation, signs and gestures are snapped up and feelings and moods can be read. As there are no demands made to participate in the conversation or to respond or perform, there is an increased sense of equality, and curiosity is aroused in participating in the conversation. This provides the individual with congenital deafblindness with greater opportunities to overhear conversations, just as most people do.

Multi-party communication in practice

One method for beginning to use multi-party communication is through games in which multiple individuals play together tactilely. Those taking part in the game – perhaps three people – remain within touching distance of one another throughout. The game may, for example, involve taking turns to clap hands, drum, play with a toy or something else that allows those involved in the game to engage in tactile interplay. This may involve only physical interaction, such as dance. Playing in this way accustoms the children to interacting in larger groups where otherwise there is



a tradition of the person with congenital deafblindness interacting solely with one person at a time.

Multi-party communication involving the congenitally deafblind consists of many different modalities. It may involve several variations on tactile language, tactile sign language, tactile physical communication, gestures, haptic signals, verbal communication and much more.

As mentioned earlier, in any situation there are also several communicative modalities that affect communication with people with congenital deafblindness. How we touch each other, how we move and breathe, all of this fundamentally affects the dialogue. As a conversational partner, it is important to remain alert for and take advantage of all these expressions of communication, both those of the conge-

nitally deafblind individual and anyone else involved in the context. It is important to help each other; to discuss, test, film and reflect in order to identify the best method.

In order to gain access to one another in this way, it is important that everyone involved in the conversation is positioned so that they are tactilely available to each other. They may, for example, sit opposite each other, in front and behind or side by side. This may be an unfamiliar situation, perhaps above all for the communication partners who don't normally interact tactilely with one another and now find themselves having to do so. It is important to discuss this in order to make the situation natural and prevent the conversation being overly affected by any awkwardness.¹¹ Naturally, certain tactile multi-party dialogues can be conducted

⁹ Malmgren, 2014

¹⁰ Lundqvist, 2012

¹¹ Jägryd & Malmgren, 2013



Illustrations: Flemming Ask Larsen

with some distance between bodies, with participants sitting side by side; however, this does not provide the same intensity and opportunities for reading body language and feelings as those conducted in very close proximity. This must depend on how close the individual with congenital deafblindness chooses to be.

Multi-party dialogues can be conducted between two professionals and one child, between parents and child, between pedagogue, parents and child or others close to the individual. Multi-party dialogues can of course also be conducted between two individuals with deafblindness and one seeing and hearing partner. The possibilities are many. It is important that the person with congenital deafblindness is familiar with and feels secure in the company of their conversational partner, someone who can also support the further development of communication in getting to know new people in order to widen the circle of friends. It is important to believe in and trust both

one's own ability and that of the person with congenital deafblindness to interact and communicate with multiple people simultaneously. This takes time and may not prove successful until after many, many attempts; however, it is vital to have the courage to try and to play together undemandingly and pleasurably.

Conclusion

Creating a fundamental sense of security around multi-party communication can increase external understanding, enrich language and increase participation. It can arouse curiosity and lead to a situation in which this kind of conversation can be conducted with new people with whom the individual with congenital deafblindness may come into contact. Multi-party communication is a way of tactilely providing access to participation and context. Using multi-party communication is extremely beneficial and developmental, both as a means of communication and an approach.

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Sofi has been working in the field of deafblindness since 2004. She began by working as a preschool and school pedagogue and teacher for children and students with congenital deafblindness. Since late 2015, she has been working as a specialist pedagogue and advisor at the resource centre for the deafblind at the Swedish National Agency for Special Needs Education and Schools (SPSM).

Her interest in tactile language and bodily tactile communication was aroused immediately on her first encounter with a child with congenital deafblindness. Realisation of the complexity of language and knowledge about the importance of being included in different social contexts and having one's voice heard led to a desire to make a contribution to the development of tactile language and communication: a deeper language and communication in which dialogue is not solely about the here and now or purely information based. Sofi wanted to give students the opportunity to make their own voices heard. Together with one of her students, Sofi and a colleague began to work on three-way communication, something that proved to be a success and a boost to all three of them, among other things in terms of language development and participation.

References

Bengtsson, J. (2005). *En livsvärldsansats för pedagogisk forskning*. I J. Bengtsson (Ed.), *Med livsvärlden som grund (With the Life-world as a Basis)* (pp. 9-58). Lund: Student literature.

Buelund Selling, H. (2013). Taktilkommunikation er mere end tegnsprog hånd over hånd. I J. Dammeyer & A. Nielsen (Ed.), *Kropslig og taktil sprogudvikling (Bodily and Tactile Language Development.)* (pp. 177-188). Aalborg: Materialecentret.

Dammeyer, J. (2013). Vinkler på taktilt sprog og kommunikation. I J. Dammeyer & A. Nielsen (Ed.), *Kropslig og taktil sprogudvikling (Bodily and Tactile Language Development)* (pp. 8-17). Aalborg: Materialecentret.

Jägryd, J., & Malmgren, S. (2013). Taktil språkighet. Tre-partskommunikation med Felix. I J. Dammeyer & A. Nielsen (Ed.), *Kropslig og taktil sprogudvikling* (pp. 189-209). Aalborg: Materialecentret.

Køppe, S. (2013). Modaliteter. (Modalities). I J. Dammeyer & A. Nielsen (Ed.), *Kropslig og taktil sprogudvikling*. (pp. 19-46). Aalborg: Materialecentret.

Lundqvist, E. K. (2012). *Rethinking interactional practices in tactile modality. A comparison between two-party and three-party interaction with persons with congenital deafblindness.*(Unpublished Master thesis). Groningen, Holland: University of Groningen.

Malmgren, S. (2014). *Att känna tillsammans. Hur känslor visar sig hos tre ungdomar med medfödd dövblindhet och hur de bekräftas av pedagoger.* Gothenburg: Department of Pedagogical, Curricular and Professional Studies, University of Gothenburg.

Haptic Signals

BETTINA KASTRUP PEDERSEN

KEYWORDS: SUPPORT SYSTEM, ACCESS TO THE OUTSIDE WORLD, DESCRIBING AND COMMENTING

Persons with a combined loss of vision and hearing are affected when it comes to the acquisition of communication, orientation and information. This has consequences for social relationships, just as the person can easily become disoriented in his or her environment. The ability to sense moods as well as the linguistic aspects of communication are also affected. In general, haptic signals involve the conversation partner "drawing" on the body when communicating. In this way they are a tool that can help reduce misunderstandings and fill in some of the "gaps" that can easily occur when one does not perceive well through vision and hearing. Haptic signals are primarily a support system used by people with acquired deafblindness and has gradually become widespread around the world.

Over the last 15 years, the Nordic countries have been working on the gathering and collation of haptic signals. This has resulted in studies, courses and various publications that can be used either for self-study or as a basis for teaching. In the process, there have been many discussions on the concept of haptic communication in relation to tactile communication, i.e. their differences and similarities. Gradually, however, agreement has emerged to call the system haptic signals. Haptic signals is a support system used in parallel with spoken language, sign language or tactile language. In relation to people with congenital deafblindness, interest has been more modest. What is interesting, however, is that, as part of tactile communication, one can apply communicative elements that resemble or can be described as haptic signals. It is therefore appropriate to investigate and describe how one can use haptic signals for people with congenital deafblindness. In this chapter¹, we learn about haptic signals as a concept and give some examples of how they have been used when communicating with people with congenital deafblindness.

¹ The chapter is a shortened and revised version of an article previously published in the Danish journal Tidsskriftet Specialpædagogik. Kastrup Pedersen, 2010

Haptic communication

INGE ALBRIGTSEN

Haptic communication – what is it?

I have pondered this question –

And I've wondered – can I manage haptic communication?

Signs and tactile signs and touches on the arm, shoulder, back –

Again and again

In the beginning it's difficult to follow, but after a while

I begin to understand, then more and more –

People say "hello" to me in the corridor

trace down my arm,

so that I understand that someone is coming,

saying who they are, saying "hello" –

sure, it gets quicker to understand

Maps on my back I find more difficult

But suddenly I realise, you're saying "the window is in that direction", on my back!

It seems a little strange, but suddenly I "see" the room better

When I'm sitting in a room and communicating, I can get to know –

That there's a computer and a telephone

and hidden cupboards there –

And I "see" a little bit more each time

The interpreters at Rycon, they are clever –

They give me training when I work there,

We talk about the Polly wheels I pack there,

And when there are none left, it's easy to understand

Using my elbow or shoulder –

I also get told when I have to WAIT

Or if there's DANGER – then I get an X on my back –

It makes it easier for me to communicate quickly in this way,

And for others to let me know –

About what's happening right where I am

How do we understand the concept of haptic signals?

"Haptic" is derived from the Greek concept of Haptikos, which is about the sense of touch. In the dictionary definition, it is described as lexically similar to the Latin word "tactile". When talking about communication in relation to people with deafblindness, the concept tactile is linked to the tactile dissemination of linguistic information, primarily tactile sign language and other tactile communication methods such as the tactile hand alphabet (the international hand alphabet, performed inside the hand) and uppercase letters (that is, uppercase letters drawn on the back of the hand, shoulder or back). Haptic signals can be included in the communication in different ways, but are not regarded as language (tactile, visual or oral). They refer to a broader way of interacting with the environment and a broader way of acquiring information about what is in the environment. However, haptic signals may contain elements from spoken language or sign language and are performed by the communication partner interacting with the person with deafblindness. The various forms of tactile communication may be listed as follows:

- *Tactile sign language* is a language in which the person with deafblindness feels the formation of conventional signs with his hands and on his body.
- *Tactile orientation* involves the person with deafblindness feeling his way through his surroundings, to get an impression of form and boundaries. (For example, finding one's way from one building to another.)
- *Haptic signals* involve a much more subtle understanding of touch. Here, the person with deafblindness is given the opportunity to perceive

form and boundaries through the touch/movement of another person. It contrasts with visual signals, i.e. what can be perceived through vision. For example, it might involve "drawing" the landscape or immediate surroundings on the back of the person with deafblindness, thus providing an impression of these.

Haptic signals – a support system

From the perspective of theoretical linguistics, haptic signals come under the rubric of total communication, and have a supplementary and supportive function for conventional and cultural language. Haptic signals are a support system, and can be sub-divided into the following groupings:

- **Haptic sign signals:** drawing, drawing signs derived from sign language, hand alphabet, letters, e.g. coffee, tea, telephone.
- **Social instant messages,** which convey social information, e.g. body language, feedback, and behaviours, as when someone laughs, coughs or does something unexpected.
- **Expressing and understanding emotions,** i.e. being able to sense the mood of the immediate environment or that of the person you are communicating with. The intensity of haptic signals, in terms of pressure and movement, are also important elements, as this can provide more subtle information and description.
- **Providing directions,** which can focus attention on something happening or towards someone speaking.
- **Leading via the use of body movements and bodily signals,** e.g. signals indicating to wait, danger, and generally any information that can quickly describe changes in the environment.

- **Sharing orientation in the environment**, such as descriptions of physical space.
- **Sharing aesthetic experiences using movement**.

Using haptic signals

Haptic sign signals are a tactile sign/touch system running parallel to the "spoken word" in communication/conversation between people with deafblindness and the hearing, between persons with deafblindness and the hearing impaired/deaf or between two persons with deafblindness. Haptic signals are intended to convey context and run in parallel with spoken language. When using haptic signals, we make use of the nerves in the skin to perceive and calibrate pressure, temperature, direction and form. At the same time, the kinaesthetic sense of the body is employed, which gives the person an impression of movement in relation to space, boundaries and balance. Various professionals and groups in the Nordic countries have been addressing the haptic support system, producing various materials related to the subject², describing in detail where on the body and in what way haptic signals can be performed. Through video observation and practical application, it has been possible to identify five haptic articulation places on the body:

1. Shoulder, top of arm. This area is typically reserved for linguistic signals, the indication of names, things etc. The area between the elbow and the shoulder indicates height and quantity.
2. The upper part of the back, or the entire back, is the articulation place for mapping spaces or the surroundings. At the top of the back, between

the shoulders, left-right directions are indicated. The spine means straight ahead or the middle of something.

3. The hand refers to the face. It can refer to facial expressions or be used in the same way as the back to pinpoint things in the surroundings. The hand is also used to indicate a response, e.g. yes, no, wait, or to write letters or words.
4. Just at the front of the knee, on the outside of the knee. In a seated position, used to indicate yes or no.
5. The instep of the foot. Response for yes/no.

For example; A lecture

A person with deafblindness is sitting down while listening to a lecture. In front of him he has a tactile sign language interpreter, interpreting the lecture itself as well as questions and answers, etc. Behind him, placed slightly to the left or to the right, is a companion/interpreter, using haptic signals to support the communication. In preparation, the haptic interpreter has drawn a sketch of the room on the user's back, placing any chairs and tables, as well as the deafblind person's position in relation to the lecturer. Suddenly, a photographer comes up from behind and towards the centre of the room to take a picture. The haptic interpreter signals this by making a "walking sign" up along the deafblind person's back, in relation to where he sits. Then the haptic interpreter places the sign "photographing" on his back where the photographer stands. In this way, the person with deafblindness will be provided with an interpretation of the lecture and at the same time with information about what is happening in the room.

Haptic signals thus focus on supporting the understanding of spoken language using techniques of touch. Using haptic signals, one would be able to describe when there is chattering going on in the lecture theatre (by having the interpreter place the sign for "talking" on the body), if someone scrapes the floor with a chair, if somebody leaves the room or where the coffee is placed etc. Using these haptic signals, deafblind persons receive information that hearing and sighted persons receive automatically. For persons with deafblindness, this provides a stronger sense of control, because you get an overview of what is going on around you.

Haptic signals from a relational development perspective

Although people with acquired deafblindness are the primary users of haptic signals, haptic signals as a support system may also prove meaningful to people with congenital deafblindness. Through haptic signals, the person with deafblindness gains information about who and what surrounds them. Haptic signals can help support a sense of coherence and minimise feelings of isolation, because the individuals gain information about others who are close by and thereby a sense of being an integral part of a situation. Haptic signals, used over time and in negotiation with the individual with congenital deafblindness, will lead to better focus of attention and concentration and a better understanding of the outside world, thereby supporting social and cognitive development.

For example; A social situation at a dinner table

Here, you could ask the questions: How does the person with deafblindness get an overview of who is sitting at the table?

What are the others eating? Where do the plates, cutlery, etc. come from? A teacher once told me that a young person with deafblindness asked him if the plates came from above.

How do you create coherence and understanding for a quite ordinary, everyday experience such as setting the table? In practice, this involves a lengthy process of exploration and negotiation of meaning. It is essential for the person with deafblindness to be an active participant and be thoroughly involved in the detailed activity of setting a table. Preparation can take a long time and may involve the partner drawing the table on his or her back, showing where different things are placed on the table and where the different dinner guests are sitting (with name signs). In addition, you can work on giving messages via signals, for example, when someone stands up and leaves. In this way, one does not need to hold onto the hands to give the information and therefore there is no interruption of the meal. The person with congenital deafblindness will be more likely to feel like "a part of the world" than one who is "in his own world". Many people with acquired deafblindness express these kinds of experiences when describing the benefits derived from using haptic signals in interpreting.

When caregivers or relatives introduce haptic signals to people with congenital deafblindness, it is very important to be aware that how they can be used and to what extent varies from person to person. It is essential that we respect the fact that all individuals have different boundaries for bodily areas that can be used in communication. For most people, this involves a type of sensory experience that is unfamiliar, and it will take time to

² Næss 2006; Latthinen 2007a, 2007b; Bjørge, Rehder and Øverås, 2013

understand the meaning of the signals. Not least, it is important to remember that this additional support system can be developed over time in cooperation with the person who needs it. In other words, communication partners must work together to find new signals, methods and ideas about how best to convey the message.

Three cases in which haptic signals are used in collaboration with people with congenital deafblindness

The introduction of haptic signals should be based on a careful consideration of what you want to work with, how you want to work and to what extent. The following are three examples of how haptic signals have been used in collaboration with people with congenital deafblindness.

Case 1, young man, only sees things that are in motion and is referred to as functionally blind³

The young man has optical nerve problems and CVI (cortical visual impairment). He has previously had a small amount of sight, but this has varied considerably. He has a congenital hearing loss and is functionally deaf. He uses tactile sign language (he was previously able to read sign language visually), sits in a wheelchair, but can walk a little. His great interest is nature, especially trees. Together with his caregivers, he enjoys cycling on a tandem bicycle and often cycles in the woods and other places where there are many paths. For about half a year, every time they wanted to describe a cycling area, they said, "now I'll draw on your back". Then they could draw how the paths in the woods bended and

turned and where they were in relation to these paths here and now. They also worked on "drawing" his school and the school's corridors on his back. Gradually, the young man has become used to the idea and can ask, for example, to have a specific place drawn on his back together with its localisation in relation to somewhere else.

Case 2, younger boy, functionally blind, born deaf

This boy has a bilateral CI (cochlear implant) which he utilises well. He uses tactile sign language and hears/understands several spoken languages. He has a syndrome that slowly reduces his motor function; he therefore sits in a wheelchair and is now having difficulty using his hands.

The focus has been to apply haptic signals when he uses a computer, as he is very motivated to work in this way. He cannot use visual information from the computer, and his caregivers therefore want to make some of the visual information "visible" on his back or elsewhere on the body. In social situations, they try to "draw" the locality and its contents on the body and via signals provide information about, for example, the one who is speaking and changes occurring in the environment.

Case 3, older woman completely blind with a small amount of residual hearing

The focus has been to introduce a signal for time/duration, as the woman is often frustrated when she finds herself in a place without contact. Here, the caregivers worked on a signal for the

woman's upper arm, which indicated how long she could expect to be without contact. The caregiver places his thumb and forefinger on the woman's upper arm and makes a greater or longer distance between the two depending on the time it will take for the staff to return.

Summary and perspectives

The perspective on haptic signals as part of tactile communication is not a new thought. In tactile communication, many haptic signals are already used; it is merely a question of having them documented, systematized and further developed. Perhaps it is also a question of having the courage to apply many more 'bodily signs'.

The use of haptic signals as part of tactile communication provides opportunities to access the outside world. The way to do this is to initiate small projects connected to the individual with congenital deafblindness and describe and set goals for each project and how to achieve them. It is also about setting up training courses in tactile communication, focusing on the fact that the participants themselves are fully aware of just how difficult it can be to perceive haptic signals and how long it can take for a sign/signal to be perceived and understood, so that this communication system can make sense in the immediate context.

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Bettina is a qualified teacher and has worked in both mainstream schools and special schools. She has carried out further professional development in special education and as a narrative counsellor. She has taught deaf children and both adults and children with congenital deafblindness for 15 years.

In addition, she teaches the subject of language difficulties, and specifically tactile sign language, as part of the Danish national staff development programme, as well as other subjects relating to communication. Throughout her working life, Bettina has been concerned with how language and communication develop if there are additional difficulties present, underlining that this does not happen by itself. Haptic signals is an area she has been particularly occupied with for the past ten years.

³ Madsen, Pedersen, Clausen and Jessen, 2013

References

Bjørge, H. K., Rehder, K. G. and Øverås, M. (2013). *Haptisk kommunikasjon*. Oslo: Abstract.

Kastrup Pedersen, B. (2010). Haptisk kommunikation. *Journal of Special Education* vol. 1- 2.

Lahtinen, R. (2007a). *Social-haptisk kommunikation*. Working text 49. Dronninglund: Nordic Staff Training Centre for Deafblind Services.

Lahtinen, R. (2007b). *Social-haptiske lynbeskeder*. Working text 48. Dronninglund: Nordic Staff Training Centre for Deafblind Services.

Madsen, C. K., Pedersen, C. A., Clausen, S. W. and Jessen, T. E. (2013). *Haptiske signaler – Et inspirationshæfte*. Catalogue no. 1057. Aalborg, Materialecentret.

Næss, T. (2006). *Å fange omgivelsene : Kontekstuell tilnærming ved ervervet døvblindhet*. Heggedal, Norge: CoCo Haptisk.

Raanes, E. (2006) *Å gripe inntrykk og uttrykk. Interaksjon og meningsdanning i døvblindes samtaler*. (Doctoral study.) Trondheim: The Norwegian Technical University

Bilingual Santeri – Switching between languages

EMMI TUOMI AND RIITTA LAHTINEN

Belief in the potential and reciprocation of tactile utterances from the very start are strong building blocks in supporting a small child with congenital deafblindness in becoming a strong communication partner. In this chapter, we update the story of Santeri as his story has inspired the field of deafblindness and led us to understand bilingual development. Santeri has contributed to the chapter with a self-portrait. For this chapter, Santeri and his mother were interviewed concerning his current situation.

"What is happening?"

In the four-volume Viataal book Communication and Congenital Deafblindness, there is a video clip¹ that confused and amazed a practitioner who had just started to work in the deafblind field: "What's happening in here? How is that even possible?"

On that video clip, three-year-old congenitally deafblind Santeri and his father are exploring haptically a grill, compost and some birch trees. Father is telling Santeri through tactile signing how the old bread and rice turns into worms and soil for the flowers. Santeri changes the subject first to the trees and its branches, then to the playhouse. Father takes and guides Santeri to explore these new attractions. On the video we can follow reciprocal tactile signing at the sentence level, joint attention, competent interaction, partnership and mutual understanding – the pillars of co-creating communication. At same time they are exploring the environment, sharing haptically what they are doing.

New practitioners were puzzled and wondered how experienced communication partners of a small boy with congenital deafblindness were able to support his access to other people and the world surrounding him. By observing and analysing his interactions with his significant communication partners, we got an insight into his way of thinking, into how he explored and conceptualised the world around him and how he expressed and shared his thoughts and feelings. The interaction in the tactile modality was a significant frame for development

of cognition, linguistic skills and conceptualisation, as language in a dialogical approach² is acquired, developed and explored in relation to actual lived life.

Today Santeri uses Finnish Sign Language (FSL), also in the tactile modality, haptics (touch messages) on the body and a written form of the Finnish spoken language in his daily communication. He utilises sign language interpreters with non-signing persons, and Braille display, for example, to send and receive emails and messages by Messenger. He shifts fluently between languages and chooses the one that suits the situation best.

With the best possible beginning, anything is possible

Santeri was diagnosed right after birth as being blind with some perception of light, and quite shortly after that, as being deaf. His mother describes the first months as "normal baby care", although object communication, body signs/haptics³ and tactile signing were considered self-evident from the very beginning.

A baby with normal hearing and vision is exposed to language right after birth. The language offered to a deafblind or severely disabled child is more rare, random and fragmented, additionally to the fact that the child's own opportunities to observe and explore the environment are very limited. Santeri was offered a whole language system, tactile sign language, hands-on signing, and haptic exploring of the environment, from very early on. His deafblindness was never considered an obstacle for him to learn language. Concepts were built and



Santeri signed his first signs before one year of age and by the age of two, he signed over 200 signs. His skills in learning concepts and causal relations were good.

explained through haptic exploration to develop shared meaning for objects and things. Santeri signed his first signs before one year of age and by the age of two, he signed over 200 signs. His skills in learning concepts and causal relations were good.

From the dialogical point of view, the prerequisite for human development is that the person has the experience of existing and of worth to someone else. Congenital deafblindness jeopardizes severely the possibilities to be seen by and to build attachment to others, and it requires special attention, recognition and comprehension from the environment. The child must be seen and understood as an active agent. The people around him must see the unclear and delicate expressions and manifestations as meaningful signals, and they must adjust their actions according to the conditions and interests of the deafblind person.⁴

Congenital deafblindness is often caused by, or associated with, a disorder

resulting in cognitive delays. Additionally, it is unfortunately common that the communication problems caused by the deafblindness slow down or hinder cognitive development, causing developmental disability regardless of the actual cognitive capacity of the person.

Santeri's story is also a story about how the communication partners surrounding him succeeded in supporting his development of communication and social competences. They accomplished this through understanding the prerequisites for communication by a congenitally deafblind person and the competent interaction partnership Santeri received from the very beginning thanks to the motivated parents and permanent personal assistant and teacher who knew sign language and deafness. The family was assigned to sign language teaching programs for almost the first ten years of Santeri's life and the specialists from Jyväskylä Rehabilitation Center for Deafblind (Finnish Deafblind Association)

¹ Rødbroe & Janssen, 2006, video 2C

² Linell, 2009

³ Lahtinen, 2008

⁴ Nafstad & Rødbroe, 2013; Jacobsen, 1993



of the year (a competition held by the Finnish Deafblind Association).⁵

Last year in the Finnish Deafblind Magazine⁶ Santeri tells about himself as a 16 years old young man. He uses his own artwork to describe his personality. The artwork is a tactile picture with different materials:

"I use different materials, that tell about me, about how I experience myself as a deafblind person through art. On the upper left corner there are small mosaic pieces organized next to each other as a square. They tell that I'm systematic and accurate. On the top middle there is a great bunch of brush which tells I am hard-working, brisk and patient. On the top right there is a green, soft felt piece, this means I'm friendly and kind. In the middle on the picture there are two rows of felt balls, this means I'm happy. On the picture there is a rice root which is generally used to make casserole brushes. The rice root crosses the edge of the frame, and it means I am sometimes lively. On the bottom of the picture there is a row of stones. Stones make my name with Braille, and it means I can learn easily different things."

In the beginning of the year 2018, the authors interviewed Santeri by email. He was asked: "Santeri, how do you communicate with your family members, at school and with your friends?"

Santeri's answer is shortened and translated to English by ET.

"With my family I communicate in tactile sign language. When I'm not at home, my

parents send me sometimes SMS-text messages and Whats App's and I read them with my own Braille screen and I write an answer and send the answer to the receiver. At home I also use a bit of social quick messages, haptics, for example when doing sports, or when working at my computer my mother guides me to choose when I'm unfamiliar with web pages. I try to learn to use the sign language interpreters more also in my free time. I believe that my life is easier, and I get more information from the environment that way.

At primary school I communicated with my personal assistants, teachers, principals and other employees in tactile sign language, but later in upper comprehensive school and now in the trade school I have my personal assistant and two sign language interpreters with me all the time, because most of the teachers and the principal don't know sign language.

With some friends I communicate in tactile sign language, and with others via interpreter. I communicate with another deafblind person by tactile sign language. I communicate also with messages, for example SMSs, Whats App, Messenger and email.

My native language is tactile sign language. I know Finnish and English, but I study them constantly. I can also communicate with deaf or deafblind foreigners with international sign language.

I think the most important thing is that a deafblind child should be taught communication methods as soon as possible after birth. When a deafblind child has learned to communicate in his native language, he can learn how to read, various skills, foreign languages, and get lots of information. In that way s/he gets

possibilities, for example to get into high school or trade school and even get a job."

It is happening. It is possible.

Santeri's mother stated when he was six years old: "If the communication development doesn't start, all the other rehabilitation is pointless." Santeri had a strong cognitive capacity from the start, and the first-class environment supported him to develop advanced cognitive skills such as reading, writing and foreign language skills. Santeri has grown up seen, heard, understood, read, accepted and as an active agent in his family and cultural environment.

Tactile sign language is Santeri's native language and he expresses himself through signing, including causal connections, logical progress and interactional elements and he shares his well thought opinions and sentiments in written Finnish, and socialises in several languages.

Santeri's cognitive skills were seen and believed in from the very beginning, and his congenital deafblindness was not accepted as an obstacle for linguistic, intellectual or social development. As Santeri's mother described, the parents couldn't evaluate the cognitive capacity of their child, but Santeri showed his capabilities and the deafblind specialists helped to understand them, believe in them and to be inspired by them.

Of course, not all congenitally deafblind persons have the same cognitive capacity as Santeri has, but without the support and faith from the environment, and without the professional knowledge of deafblindness and cognitive development in interaction, his story would most likely have been different.

and NUD (NVC) supported the family from when Santeri was two years old. A motivated, competent and committed teacher taught Santeri almost throughout comprehensive school, partly independently and partly in a group with a personal assistant.

Me, Santeri, as a young man

During his teenage years Santeri worked as a trainee at the Finnish Deafblind Association and as a part of the traineeship he went to art museums, evaluating the art pieces and the accessibility of the museums. He explored the sculptures haptically and constructed stories about the sculptures. Santeri was also asked to choose The most touching sculpture

⁵ Grönlund, 2017, p.7

⁶ Grönlund, 2017

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References

Finnish Broadcasting Company, video clip. [<http://areena.yle.fi/1-3785443>] (25.6.2018)

Grönlund, M-M. (2006). Kommunikaatiomenetelmien oppimiseen tarvitaan kaikkia. In Ylitalo, A. (toim.). *Muuttuva kommunikaatio*. [Communication changes]. Suomen Kuurosokeat ry. Julkaisuja A5. Tampere: Cityoffset Oy, Tampere, 53-60.

Grönlund, S. (2017). Minä, Santeri. [Me, Santeri] *Tuntosarvi Magazine* 8. The Finnish Deafblind Association, 7.

Jacobsen, K. H. (toim.) (1993). *Syntymästään kuurosokeiden kanssa tapahtuvan kommunikaation edellytyksiä*. Pohjoismainen käsikirja n:o 15. (orig. Forutsetninger for kommunikasjon med døvblindfødte.). Suomen kuurosokeat ry. Ylöjärvi: Ylö-Offset.

Lahtinen, R. (2008). *Haptics and haptemes. A case study of developmental process in social-haptic communication of acquired deafblind people*. Doctoral dissertation. University of Helsinki. Tammerfors: Cityoffset Oy: Tampere.

Laitinen, J. & Heino, I. Santeri haastattelun viittomakielisen tekstin käännös Koskettavin veistos. Interview: [http://www.kuurosokeat.fi/tiedosto/Santerin_haastattelu.pdf] Video 8 minutes. (15.2.2018)

Linell, P. (2009). *Rethinking Language, Mind and World dialogically. Interactional and Contextual Theories of Human Sense Making*. Charlotte, NC: Information Age Publishing.

Nafstad, A. & Rødbroe, I. (2013). *Kommunikatiiviset suhteet. Toimenpiteitä, joilla luodaan kommunikaatiota syntymästään kuurosokeiden kanssa*. (orig. Kommunikativa relationer). Ålborg: Materialcentret.

Rødbroe, I. & Janssen, M. (2006). *Kommunikaatio ja synnynnäinen kuurosokeus I: Synnynnäinen kuurosokeus ja kuntoutuksen pääperiaatteet*. (orig. Communication and Congenital Deafblindness I: Congenital Deafblindness and the Core Principles of Intervention). Sint-Michelgestel, The Netherlands: VCDBF/Viataal.



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