The Integration of Social-Haptic Communication in Deafblind Interpreting and Educational Settings

edited by
Anna Cardinaletti and Laura Volpato

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Anna Cardinaletti and Laura Volpato

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edited by Anna Cardinaletti and Laura Volpato

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The Integration of Social-Haptic Communication in Deafblind Interpreting and Educational Settings
edited by Anna Cardinaletti and Laura Volpato

Abstract

The volume is a collection of state-of-the-art papers presented at the first international conference on social-haptic communication (SHC) held at Ca' Foscari University of Venice on September 4-5, 2023. This volume addresses the need to gather and explore international expertise around the integration of SHC in the practice of deafblind interpreting and education. SHC consists of brief tactile messages ('haptices' or 'haptic signals') performed on the body of the deafblind person to convey relevant contextual information, enabling the transfer of both social and environmental information. SHC can be used with and by any deafblind person independently of their preferred communication modes and often in combination with linguistic information conveyed through the other communication channels (tactile or visual sign language, Malossi, etc.). Starting with the pioneering work by Russ Palmer and Riitta Lahtinen in Finland in the Nineties, SHC has spread to the Scandinavian countries, the USA, many European and extra-European countries, and more recently to other European countries including Italy. The volume presents the history of the development of SHC in different contexts and the integration of SHC in deafblind interpreting and educational settings. Deafblind interpreting is a complex task, requiring guide-interpreters to have linguistic skills, guiding skills, and descriptive skills. SHC has now become an important part of their training and professional activity in many countries. Social-haptic signals are still being developed for children and adults for different purposes in specific areas. In all contexts, SHC contributes to the inclusion of deafblind individuals and to improve their autonomy. The experiences reported in the volume and the haptic signals created in the different countries will be very valuable for professionals in those countries, like Italy, where SHC was introduced only recently, and the many countries in which SHC has not developed yet.

Keywords Social-haptic communication. Deafblindness. Interpreting services. Tactile Sign Languages. Educational contexts.

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The Integration of Social-Haptic Communication in Deafblind Interpreting and Educational Settings

Introduction

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Summary 1 The 2023 Conference on Social-Haptic Communication. – 2 SHC in Italy. – 3 The Contributions to the Volume.

1 The 2023 Conference on Social-Haptic Communication

This volume is a collection of state-of-the-art papers on social-haptic communication (SHC) presented at the first international conference on SHC held in Italy, entitled *The Integration of Social-Haptic Communication in Deafblind Interpreting and Educational Settings*. The Hapticconf 2023 was organized by the Department of Linguistics and Comparative Cultural Studies of the Ca' Foscari University of Venice and held on September 4-5, 2023 in Aula Magna Silvio Trentin and on Zoom. The number of participants from Italy and abroad, including many deaf and deafblind people, was impressively high (110 in person and more than 250 on Zoom), attesting the widespread interest for the topic.

This conference aimed at gathering international expertise around the integration of social-haptic communication in the practice of deafblind interpreting and in deafblind learning environments. Social-haptic communication is extensively used in the Scandinavian countries and in many other countries, as confirmed by the participants and the speakers to the conference coming from all

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over the world (Africa, Australia, Brazil, many European countries).[1] SHC was introduced in Italy only recently (see § 2).

The international relevance of the conference was witnessed by the opening greeting of Dr. Sanja Tarczay, President of the World Federation of the Deafblind (WFDB). Its national relevance was underlined in the opening greeting by Dr. Patrizia Ceccarani, representing the Foundation Lega del Filo d'Oro E.T.S., the Italian Foundation focused on the needs of individuals who are deafblind.

SHC consists of brief touch messages (*haptices* or *social-haptic signals*) performed on the body of the deafblind person to convey environmental information, reactions by the interlocutors, directions, etc. SHC can be used with and by any deafblind person independently of their preferred communication modes and often combined with linguistic information conveyed through the other communication channels (tactile or visual sign language, Malossi, etc.). Haptices are used to communicate information in real time during different kinds of activities, including social interactions, descriptions of the environment, guiding and mobility, cultural events, hobbies, etc. (Lahtinen 2008, 142-6).

Starting from the pioneering work by Riitta Lahtinen and Russ Palmer in Finland in the 1990s, SHC has spread to the Scandinavian countries, the USA, many European (Belgium, England, Spain, The Netherlands, etc.) and extra-European countries (Australia, Brazil, Egypt, Zambia, etc.), and more recently to other European countries including Italy. Social-haptic signals are still being developed, through the negotiation with deafblind individuals, to respond to children's and adults' needs in specific areas and for different purposes. In all contexts, SHC improves communication accessibility with and among the Deafblind community and contributes to their autonomy and inclusion. SHC is also used with individuals with special needs beyond acquired deafblindness, such as individuals with congenital deafblindness, visual impairment, and intellectual disability. Its potentiality is not yet fully explored.

1 The selected papers from three more countries could unfortunately not confirm their participation in the conference: Amal Ezzat (Hope City Foundation, Egypt) "Integration of Social Haptic Communication in the Language Development"; Simate Simate (Deafblind Association of Zambia) "The Potential of Haptic Communication to Facilitate Training for Employment Among Deafblind Persons. A Case Study of Zambia"; Francisco J. Trigueros (FASOCIDE, EDbU) "Progress of a Haptic System in Spain".

2 SHC in Italy

In Italy, the development of social-haptic communication started in the last few years. This was possible thanks to a European project in which Ca' Foscari University Venice was the Italian partner and collaborated with the Foundation Lega del Filo d'Oro E.T.S. The Erasmus+ project entitled *Social Haptic Signs for Deaf and Blind in Education* (September 2019-November 2022) aimed at collecting and standardizing social-haptic signals in four European countries: Estonia, Italy, Portugal and Sweden, with the coordination of Thomas Lydell-Olsen, Founder and coordinator of the Europeiskt Teckenspråkcenter/European Sign Language Centre in Örebro, Sweden.

With the collaboration of the Lega del Filo d'Oro and the involvement of many people with deafblindness, about 130 social-haptic signals were negotiated and collected, and then made publicly available in the dedicated section of the Spreadthesign website: `https://spreadthesign.com/it.it/social_haptic/` (Volpato, Cardinaletti, Ceccarani 2021). The process of creating and spreading the Italian social-haptic signals is presented in Volpato's (2024) doctoral dissertation, and its integration in deafblind interpreter training is discussed in Volpato, Mantovan 2021. In recent years, a dramatic change has occurred in the training of sign language interpreters and guide-interpreters in Italy, due to the official recognition of Italian Sign Language (LIS) and Tactile Italian Sign Language (LISt) by the Italian government on May 19, 2021. Law 69/2021 (`https://www.gazzettaufficiale.it/eli/gu/2021/05/21/120/so/21/sg/pdf`) also recognizes LIS and LISt interpreters as specialized professional figures. Their training, still under discussion, will hopefully integrate SHC as happened in other countries.

Volpato (2023) and Volpato (2024) also developed a detailed analysis of haptices in terms of their minimal components, i.e., haptemes in Lahtinen's (2008) terminology, similar to the phonological features of spoken and sign languages. As proposed by Lahtinen (2008) for Finnish SHC, each Italian haptice is articulated as a specific combination of haptemes, such as Place of articulation, Handshape, Movement (and direction of movement), Pressure, Speed, Duration, etc. Some of these components are also relevant in the articulation of visual sign languages, others, such as Pressure and Contact surface, depend on the tactile reception.

Before the Erasmus+ project, Ca' Foscari has been fruitfully collaborating with the Foundation Lega del Filo d'Oro E.T.S. for more than 10 years. Since 2012, Ca' Foscari University has been offering a course of Tactile Italian Sign Language as the only University in Italy. The engagement on the development of social-haptic communication in Italy confirms the commitment of Ca' Foscari towards deafblindness

in addition to its long-standing commitment towards deafness. Ca' Foscari is a leader University in Italy for both research and teaching on Italian Sign Language, the culture of the Italian Deaf community, the acquisition of LIS and written Italian by deaf individuals, and the training of LIS interpreters. The Deaf Studies program started 25 years ago, in academic year 1999/2000. For the history of teaching and research on deafness and LIS at Ca' Foscari, cf. Cardinaletti 2018 and Branchini, Cardinaletti, Mantovan 2024.

3 The Contributions to the Volume

The volume contains eleven papers delivered at the Hapticconf 2023. They present the history of the development of SHC in different countries and the integration of SHC in deafblind interpreting settings and in educational contexts.[2]

Four contributions report on how SHC developed in their countries. The paper by Riitta Lahtinen and Russ Palmer reports the birth of SHC in Finland in the 1990s of last century due to their collaboration. The first social-haptic communication article was published in the Proceedings of the 3rd IAEDB (DbI) European Conference in Potsdam in 1993 (Palmer, Lahtinen 1994). This research allowed people with acquired deafblindness to develop the touch communication that was later called 'social-haptic communication'. After a long process of creation and study of social-haptic signals, the definition of social-haptic communication was provided in Lahtinen's (2008) doctoral thesis and Lahtinen, Palmer, Lahtinen 2010.

In their paper "A Historic Perspective on Social-Haptic Communication in Norway", Bibbi Hagerupsen, Hildebjørg Karlsen Bjørge and Kathrine Goborg Rehder report on how SHC developed in Norway in the late 1990s through the collaboration between a Norwegian deafblind woman, Trine Næss, and Russ Palmer and Riitta Lahtinen. Trine Næss and their interpreters, who after her death

2 The following four papers were also presented at the conference: Linda Eriksson (The Swedish National Resource Center for Deafblindness – NKCDB): "Social Haptic Communication that Facilitates the Use of Computers and Smartphones"; Sigrid Slettebakk Berge (Norwegian University of Science and Technology, Trondheim): "Who is Doing the Talking? The Mutual Construction of Social Haptic Signals in Interpreter Mediated Dialogues Between Deafblind Interlocutors"; Peter Vanhoutte (Anna Timmerman VZW, Belgium), Koen Amerlynck, Annie Dierickx: "A Walk Through Social-Haptic Communication in Deafblind Interpreting"; Annmaree Watharow (Centre for Disability Research and Policy, University of Sydney), Moira Dunsmore (School of Medicine and Health, University of Sydney), Susannah McNally (Centre for Disability Research and Policy, University of Sydney): "Older People with DSI: Haptics and More". We thank the authors for their insightful contributions to the conference and regret that they could not participate in the volume.

founded the Hapti-Co company (https://hapti-co.com/english), developed the system of Norwegian social-haptic signals, which was also the base for social-haptic communication in the USA. SHC is now part of the training of sign language interpreters and professionals in three Universities of the country, where deafblind teachers are also involved. Hapti-Co is also responsible for the training of individuals with visual impairment. The National Blind Association realized that haptic signals could help reduce some of the obstacles that visual impairment may cause in everyday life.

As reported in Klaske De Greeuw, Thea Hendriks, Annette Schuster and Gaby Wynia's paper "Development of Social-Haptic Communication in the Netherlands", the project group for SHC in the Netherlands was formed in 2015 and took part in a two-day training led by Riitta Lahtinen and Russ Palmer. Employees of various organizations that work with people with deafblindness (amongst which DB-connect, Kalorama, and Kentalis) collaborated with 'experts by experience', that is, deafblind people. The Dutch social-haptic signals were based on the SHC manuals developed in other countries such as Finland, Denmark, and Belgium. The group has published both the teachers' manual and the students' manual used in the training courses and workshops they organize, as well as an adapted SHC training for people with deafblindness and intellectual disability.

Portugal was one of the countries that participated in the Erasmus+ project *Social Haptic Signs for Deaf and Blind in Education*, financed by the European Union. In the chapter "Building Up Social-Haptic Signs: The Portuguese Team", Cristina Gil, Bruno Mendes, Paula Liques and Orquídea Coelho document the creation of 24 haptic signs used by Portuguese Deafblind people, included in a published set of 80 national haptic signs developed for the Erasmus+ project (see https://spreadthesign.com/pt.pt/social_haptic/). The chapter details the methodology used, with the crucial collaboration of deafblind persons in the creation and filming of the social-haptic signals and in advancing the promotion of SHC in Portugal.

The three next chapters deal with social-haptic communication used in interpreting services. Eli Raanes' contribution entitled "Haptic Signals as Part of Interpreter Services for Deafblind People. Historical and Developmental Perspectives from a Norwegian Context" is a detailed report on how social-haptic communication was integrated into the interpreting services and the training of interpreters in Norway.

The chapter "Social-Haptic Communication in Brazil and Its Developments. Paths and Possibilities" by Elaine Gomes Vilela, Adriana Barroso de Azevedo and Stephanie Caroline Alves Vasconcelos, focuses on an eight-month training of four professional translators and guide-interpreters of Brazilian Sign Language (Libras) and

three deafblind people in the use of social-haptic communication (SHC). In Brazil, SHC was introduced by guide-interpreters and deafblind individuals who participated in the 10th Helen Keller World Conference, held in the Philippines in 2013. The chapter is a qualitative, narrative-based study of the participants' comments during the training, which reveal how relationships are established via touch-based interactions.

Johanna Mesch' chapter entitled "Touch and Haptic Sensations in Conversations Between Deafblind Signers and in Tactile Interpreting" is a case study on a corpus of conversations among Swedish deafblind signers. In combination with Tactile Swedish Sign Language, haptic communication is used quite differently by deafblind individuals in peer conversation and by providers and interpreters undertaking various activities. The places of articulation on the body are different, as well as the type of information conveyed, which is related to the different sensory access of deafblind interlocutors versus sighted interpreters and providers.

Giorgia Zorzi, Eli Raanes, Johanna Mesch and Gro Hege Saltnes Urdal's contribution "Depiction Beyond Hand Touch in an Interpreter-Mediated Setting Using Tactile Norwegian Sign Language" is a very detailed study of depicting signs from Tactile Norwegian Sign Language that are realized on the body of the deafblind person and not in the neutral signing space. They were used in constructed actions during an interpreter-mediated setting. Furthermore, these signs do not necessarily use hand touch, but may exploit other sensory inputs. For instance, the haptice BLOW is realized on the body of the deafblind person not through touch, but through air vibration in a flow of air out of the interpreter's mouth to the deafblind person's skin. The study opens up a very promising new sub-field in the research on social-haptic communication.

Finally, three papers present experiences with SHC in educational contexts.

Heather Colson-Osborne presents the "Benefits of Using Social-Haptic Communication with Children and Young People Who are Congenitally Deafblind", an understudied topic in particular in the UK. The chapter describes some situations in which social-haptic signals can be used in schools and colleges in order to reduce the deafblind students' isolation and improve their participation.

Russ Palmer and Stina Ojala's chapter on "Astrohaptices: Touching the Universe" is a fascinating contribution on how to make astronomy-related notions accessible to deafblind people in educational settings such as schools and museums. The techniques to create new haptices are presented in great detail. They can be used to describe both static objects, such as photos or maps, or dynamic events, such as a rocket launch or orbits. Astrohaptices may be used

as a complement to other facilities such as tactile maps or touch tours in order to improve accessibility for the deafblind.

The final chapter by Cathrine Timm Sundin and Nina Frisnes Øyan "Haptic Communication and Guide Dog" discusses a topic that has not received attention in the literature, namely the use of haptic signals to support the use of guide dogs for people with deafblindness and to improve communication between a person with deafblindness and their guide dog. In a pilot project, deafblind participants received not only information of the surroundings but also a variety of signals to gain information on the behaviour of their dog and to be able to give the right commands to the dog. This successful pilot project is shared with the aim to replicate it in other contexts and other countries.

In conclusion, the volume is a very rich and inspiring presentation of SHC, which will be very valuable for professionals and care-givers in those countries, like Italy, where SHC was introduced only recently, and the many countries in which SHC has not developed yet.

Acknowledgements

We heartily thank the hundreds of participants in the conference, who contributed to make it an unforgettable event, and all the authors for having contributed to a very stimulating conference and having shared their insights in the following pages. We are also very grateful to Elena Fornasiero, Pietro Rigo and Lara Mantovan for helping us in the organization of the conference, and the (tactile) sign language interpreters who made the conference accessible to the many deaf and deafblind participants. A special thanks goes to the peer reviewers that carefully read the abstracts for the conference, and to the three very generous peer reviewers of the volume, whose helpful critiques have greatly enhanced it.

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Part 1
The Development and Use of Social-Haptic Communication in Different Countries

The Integration of Social-Haptic Communication in Deafblind Interpreting and Educational Settings
edited by Anna Cardinaletti and Laura Volpato

Social-Haptic Communication
History, Research and Applications

Riitta Lahtinen
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Russ Palmer
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Abstract This essay focuses on the origin of the social-haptic communication (SHC) from early 1990's to the present day, research and applications during the past 30 years. SHC includes a glossary of various haptices that are organised into sub-groups. These vocabularies of haptices have been analysed. Each haptice consists of haptemes, the grammar elements of SHC. SHC can be used with acquired and congenitally deafblind people in different parts of the body. Lahtinen (2008) defined haptices as touch messages that allow two or more people to interact and share their experiences of the visual, auditory and haptic world holisticly and systematicly.

Keywords Deafblindness. Social-haptic communication. Haptic. Haptice. Hapteme. To haptier.

Summary 1 Introduction. – 2 Social-Haptic Communication: The History. – 3 Terminology and Definitions of the Haptic Framework. – 4 User Groups and Origins of Haptices. – 5 Social-Haptic Subgroups, Research Areas and Lexicons. – 6 Haptemes, the Elements of Touch. – 7 Conclusions and Future Considerations.

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1 Introduction

Deafblindness causes challenges in many areas of everyday life; in communication, mobility, receiving information and everyday activities. Congenital deafblind people often have other additional complex needs that can challenge learning and independent living (Nordic Welfare Centre 2018). Deafblindness varies a lot between individuals, and their communicative means and combinations thereof may vary. Communication methods vary depending on the usability of senses in them. Some exploit their residual hearing by using individually tailored hearing aid devices (spoken language, clear speech), while others use visual perception (lipreading, visual signing, written text) in combination with sense of touch (Braille, manual alphabets, tactile fingerspelling, tactile signs and sign language). When moving around, people use technological equipment, such as navigation tools, either via mobile phones or as an addition to the more traditional aid such as the red and white cane. When vision and hearing change and deteriorate, other modalities such as touch/tactile, kinaesthetic, smell and taste become vital. The combination of tactile and kinaesthetic information is called the haptic modality, with touch information being only one part of the haptic system. The haptic modality presents the framework for social-haptic communication (SHC) research, because movements are key to understanding the basic elements of the SHC, haptices and haptemes.

We, the authors, share haptices every day. They change according to situations, activities and communication methods we use at that moment. We use spoken language, tactile signs, tactile fingerspelling, block letters, objects and haptices together simultaneously. Sometimes we use haptices independently. This is possible because of the fundamental elements of SHC, defined as haptemes. This grammar of haptices allows new haptices to be constructed in a new situation.

Haptices can be used (haptiered) sequentially or simultaneously (i.e., different haptices at the same time). The SHC approach includes shared experiences of language and environmental information based touch and body movements as well as orientation. For us, in the last 30 years SHC meant sharing additional information independently. SHC allows the linking of many haptices to build a social-haptic sentence as follows: “We are at the doorway of a classroom. In front of you, we have five rows of chairs. The teacher’s table is at the front of the room. On your left side there is table with coffee” (Lahtinen, Palmer 2005; Palmer, Lahtinen, Ojala 2017). Haptiering is a part of our multimodal communication and language approach.

2 Social-Haptic Communication: The History

Until 1990s, there were no studies on touch messages. The research on this touch field and how people share information with these messages, later defined as haptices, started from the material available. There was some material on how to use block letters, various fingerspelling systems and tactile sign language. But there was less information on how we produce and receive touch in general and touches in particular onto the body. Touch has been mentioned in some biographies and case study articles of individual acquired and congenital deafblind people. During the first author's early years as a sign language interpreter and teacher of different communication methods in the 1980s, she observed and analysed how deafblind couples and family members were using touch messages between themselves. Many times, they were not aware of using them because touch is a natural way of being in contact with their deafblind family member.

The first time the authors became aware of using touch for telling something important was identified in 1992. Russ did not have his hearing aids on during a fire alarm drill. This made us realise how important carrier of information touch is in an urgent situation where visual and auditive modalities/sight and hearing communication are not an option. Figure 1 demonstrates the international emergency X-haptice onto the back done with a finger or the whole hand (Lahtinen 2008, 189).

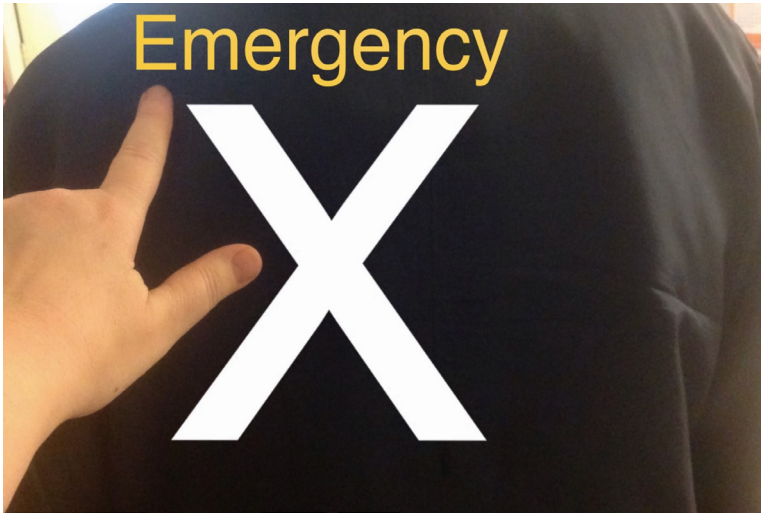

Figure 1 International emergency X-haptice onto the back

Research by the first author (Lahtinen 2008) started in 1991, when touch messages and the haptic framework was introduced to a professor at the University of Helsinki. He commented that if we want to develop it into a philosophy and design the methods for it, it will take about 20 years. He was evidently correct, as the doctoral dissertation was published in 2008 with the title *Haptices and Haptemes. A Case Study of Developmental Process in Social-Haptic Communication of Acquired Deafblind People*.

The first lecture at a conference and the paper published in the proceedings was entitled "Communication with Usher People". This was in 1993 at the Deafblind International conference in Potsdam, Germany. This article was later translated into seven other languages (Lahtinen, Palmer 1994). This focused on how the YES- and NO- and directional-haptices could be produced and received in interactions between a deafblind and a hearing-sighted person in a social situation. This was the beginning of social-haptic communication and it was well-received by the conference audience. The development of SHC over the years has been documented in many publications, articles and books.

During Russ' music therapist studies at Sibelius Academy in Helsinki, Finland in the mid 1990s, one lecture turned out to be a defining moment for the SHC research. All the lectures were in Finnish, which needed to be translated into English spoken language. Nobody was allowed to speak during the lecture and the lighting was dim, so the only available means of communication that remained was through touch. In the end of Guided Imaginary Story, we realised that touch was enough for telling the story given by the lecture: summer, warm weather, seaside, walking on the beach, etcetera.

Afterwards at home, The Body Story concept was born out of the analysis of our experiences during that important lecture, that is, a body-based storytelling technique that improves communication, relaxation and contact with sensory impaired people. The book includes not only the insights from that analysis but also 10 years of practical exercises, feedback and analyses of touch messages with deafblind people, their family members, volunteers and interpreters in different countries. We produced our first book and DVD The Body Story, Creative Musical Images through Touch in 2005 (Lahtinen, Palmer 2005).

From the beginning, it was clear that people with frequent contact with deafblind people would be a very valuable source of information for testing and giving feedback of using haptices. We met many deafblind people, their co-habitants and professionals in the field. The work began with arranging workshops in different countries, such as UK (1993), Finland (1995), Sweden (1996), Norway (1997), Switzerland (1997), Denmark (1998), France (2000), The Netherlands (2007), Italy (2010), Canada (2010), Australia (2010) and Brazil (2015).

Those early days, we were introducing the first level of haptices and analysing how deafblind people understood them. We were trying to identify if there were differences across the countries dependent on the relation between sign languages and cultures. In the Nordic countries, the sign language deafblind communities were strong and had support from their deafblind organisations. This formed the basis for their diverging haptices but within the social-haptic framework. Simultaneously, it emerged that some of these initial ideas were redefined under different names such as haptic signals and haptic communication, resulting in some confusion even to date. The Social-Haptic Network (`https://www.deafblindinternational.org/social-haptic-network/`) held its first international seminar "Touch You, Touch Me" in 2010 in Helsinki, Finland.

3 Terminology and Definitions of the Haptic Framework

The first academic publication in the field was Lahtinen (2003), where she studied how haptices (at the time they were referred to as YES and NO-signals) are used to give and receive feedback in a conversation framework. The study shows the adaptability of haptices for the first time. We can haptier them on various parts of the body, and the size of the haptice is irrelevant in feedback so it may be condensed to improve efficiency in some cases. We can haptier confirmations using 1, 2, 3, 4 or 5 fingers, and the meaning is the same (condensation). Feedback confirmation haptices show that location and handshapes are not as important as in visual sign language, that is, the message prevails despite location and haptic form changes. It also revealed how basic movements in haptices copy the body's innate iconic movements. This started the evolution of haptices as a system.

Social-haptic communication research is operating in the haptic framework. The haptic framework provides a wide understanding of how tactile, kinaesthetic (movement), and proprioceptic information are used together **[fig. 2]**. Haptic exploration is defined as a person's contact to the environment through hands, feet and whole body. Haptic signals are delivered by a technical device as a part of haptic communication. Haptic communication and information are received individually through various technical devices. For example, a joystick may give one haptic force-feedback when playing a game.

Social-haptic communication is the interaction between two or more people in a social setting using haptices. Haptices are touch messages, which can be haptiered onto different body areas as agreed. Haptiering means producing and receiving haptices, where both parties are involved in improving the quality of information during a conversation or spontaneous activity. During the interaction,

they are able to gain a holistic experience of the visual and hearing environment. Within the smart clothes research, haptices can be relayed from a distance using wireless technology **[fig. 2]**. This is an area where haptic and social-haptic communication are combined to experience haptices onto the body, which can be defined as mediated social-haptic communication through smart clothes (Holt, Palmer, Lahtinen 2025).

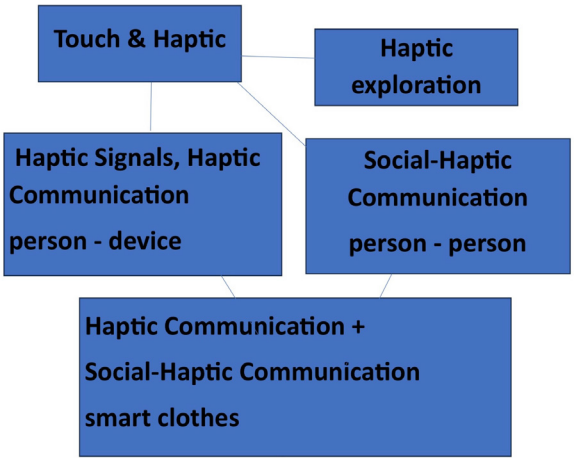

Figure 2 Concepts of touch, haptic, haptic exploration, haptic signals, and social-haptic communication

4 User Groups and Origins of Haptices

SHC can be used as an independent language or provide additional information when combined with auditive (speech) and visual languages (signing) or other communication methods.

For the authors, SHC is conceptualized as a language in the situations and contexts when spoken or sign language is not needed or is not used. This is based on decades of practice using touch constantly and experiencing touch as a native user. Many students who learn certain limited agreed haptices use by their family members or professionals call SHC as a method of communication. For them, haptices give additional information when also using spoken or sign languages. SHC is recorded to be used with deafblind people in different countries who use

- spoken languages, clear speech,
- visual sign language, narrow visual frame signing and tactile sign languages,

- written modality, such as block letters, manual alphabets, various fingerspelling methods, Braille, speech-to-text,
- pictures, such as drawings, photos, pictogrammes,
- body gestures.

Teaching social-haptic communication started in the late 1990s at the Department of Special Education in the University of Helsinki, Finland. SHC was introduced for interpreting education in Finland around the same time and approved officially in the curriculum for those qualifying as interpreters for the deafblind in the early 2000s. Each deafblind person has their own personal interpreting profile that outlines the communication, guiding and description methods they use. This also includes social-haptic communication. During the COVID-19 pandemic, social-haptic communication was introduced as an online course for professionals, researchers and deafblind people with their interpreters or personal assistants. It was clear that teaching SHC online had its challenges, as it is challenging to understand how to experience haptices without physical contact.

SHC started to be used and applied to other user groups such as people with learning disabilities, staff working with the older people and people with dementia and those in palliative care. Currently, the users also include various other communication disorders and disability groups, especially therapeutically or within teaching framework. Haptices are produced by haptiering what was previously described as drawing onto the body. Haptices are based on (Lahtinen 2008):

- body movements (laughing, stop),
- orientation (directions),
- function and activities (walking),
- written language and letters (T-switch, telecoil function),
- adapted visual signs and sign language (coffee),
- visual perception (shapes),
- auditive sounds (music),
- haptic bodily experiences, vibrations (music).

When signs are converted into haptices, their grammatical structure changes. Touch and the kinaesthetic sense form a distinct channel for receiving messages that are different from visual or auditive ones. This is the reason why sign language signs undergo modifications when they are used as haptices.

5 Social-Haptic Subgroups, Research Areas and Lexicons

Haptices share our non-verbal information, visual, auditive and haptic information, also known as environmental description, in real-time. The iconicity of some haptices makes them universal. Haptices as I AM HERE or I LEAVE and haptiering different shapes (circle, line, square) onto the back are understood similarly in many countries. Haptices can be grouped into several subgroups used in a particular situation or by a specific group of professionals. During more than 30 years of using haptices daily with deafblind people, these different subgroups of haptices have expanded.

These subgroups include haptices that share social information such as facial expressions, emotions and behaviour. Facial expressions are relayed by a subsystem known as Emotional Response Hand (Lahtinen, Palmer, Lahtinen 2010), by which individuals can share their own feelings, or describe other people's facial expressions. These can be SMILE, LAUGHTER, ANGRY, TEARS and so on. This is an adaptive and creative way of sharing expressions onto different part of body as the receiver's face is not recognised as a neutral area for touch. People's body movements are copied and haptiered by WALKING/STANDING-haptices and their variations. Figure 3 illustrates these different lexicons.

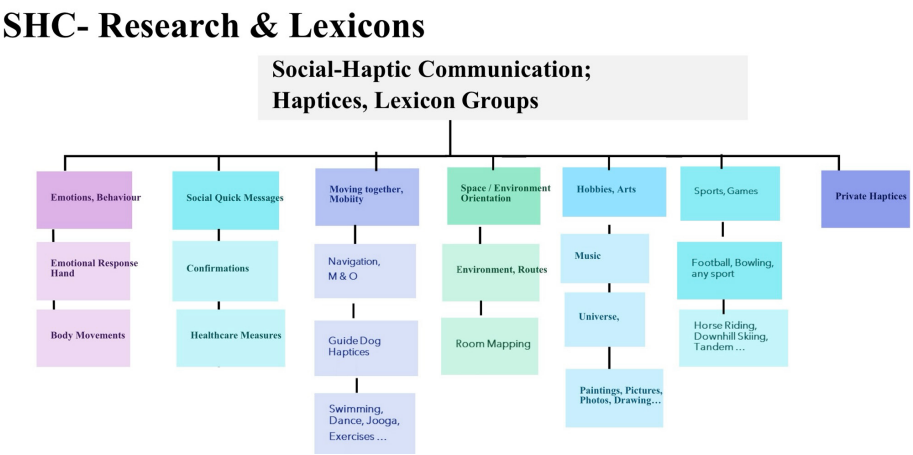

Figure 3 Social-haptic communication lexicon groups and research areas (Lahtinen 2008, 53)

Social quick messages are functional, every day haptices, which we usually teach first for deafblind people and family members. They are for example initiating and maintaining contact (I am here, I stay

here), turn-taking, leaving the personal area and identifying a person (bodyname-haptice). YES and NO-haptices are tapping and sliding movements respectively onto the hand, lower arm or onto the side of a leg or a person's back, depending on the body positions. That was also the first stage in the initial development of the confirmation haptices. In the next phase, the double hands-on confirmations started to evolve.

The directional haptices show the direction the other person is approaching from, giving the deafblind person the chance to react or offer a greeting. These haptices are haptiered in relation to the recipient's body. If someone is leaving, this can be indicated by the WALKING-haptice, which will at the same time indicate the direction where the person is leaving. Social quick messages are adaptable; they can be produced onto different body areas such as the back, the shoulder or the arm.

Health care measurements, known as hospital-haptices in healthcare settings, have been studied with deafblind people and hospital staff during treatment procedures such as cataract operations, various medical examinations and when in isolation rooms. Hospital-haptices provide information to patients as to what is happening or how to respond by their own movements. The use of haptices can be agreed by the patient and healthcare practitioner in advance. Haptices are chosen according to individual needs and are for example measurements (BLOOD PRESSURE), length of treatment (END OF TREATMENT), emotions (ARE YOU OK?), movements (DO NOT MOVE) and confirmations (YES, NO) (Palmer 2015; Lahtinen, Palmer, Tuomaala 2016).

Messages when moving together means guiding with body movements, muscles and joints. Additional haptices can be given such as YES and NO-haptices, STOP and WALK and other direction information. Guide dog users and mobility instructors have developed guide dog-haptices (see the chapter by Cathrine Timm Sundin and Nina Frisnes Øyan in this volume). These haptices include information working with a dog, like the position of the dog, what the dog is doing (running around, sitting), the map of the environment and confirmations from the mobility instructors onto the back of a dog user.

Describing space and environment include pointing, directions and the appearance of objects. Objects' thickness, size and depth can be expressed by comparing them with the body dimensions and height. At the same time, the receiver can explore the object and have a contact and orientation to the environment. When haptiering a room onto the back, the receiver is using their mental mapping and muscle memory, based on their bodily experience of the environment, shapes and routes.

Hobbies and arts, like visual arts (pantomime, painting, pictures), and auditive arts (music and dance) can be haptiered onto the body by combining different movement, location and colour-haptices. When

hobbies are described and illustrated onto the body, certain things are often agreed on beforehand such as horse riding (directions, turns, stopping, speed). During downhill skiing, walking poles are used, and through them, we can share haptices such as directions, stopping and speed. When tandem-cycling, the deafblind person can also give haptices to the sighted guide, who is sitting in front of him/her, including directions from memory.

Many sports and games are based on the same kind of game-haptices, for example the game of football. These are (cf. Lahtinen 2008)

- permanent information: starting point, tracks, target (goal, position, defence areas, lane, foul line),
- changing information: advancing of teams, the direction of the ball; straight forwards, to the left or right,
- new position information: penalty kick,
- starting of action,
- results: agreed body location, where the score or route is expressed.

Haptices play an important part of everyday life when visiting museums or exhibitions. In some cases, sign language interpreters may be involved in sharing musical performances (Palmer, Lahtinen, Ojala 2012) or portraying the astronomical events in the night sky (Palmer 2021; see the chapter by Russ Palmer and Stina Ojala in this volume). Private haptices are shared by two people in more intimate situations and are used mostly in a private way and larger body areas, like humour and aesthetic messages.

6 Haptemes, the Elements of Touch

The great discovery of the social-haptic communication research was the realisation that haptices are a combination of smaller elements called haptemes. Every haptice consists of set of haptemes that form a hierarchical, linguistic system of their own. Every haptice has its own set of haptemes, and that set allows each haptice to be identified and distinguished from the others. Each haptice does not have to include all haptemes. They can be combined sequentially or simultaneously, this means producing functional sentence structures. Haptemes here are seen as analogous to phonemes in spoken or sign languages. Spoken and sign languages have their own phonologies through auditive and visual modalities. In SHC, the hierarchical properties of touch are used (Lahtinen 2008).

When using haptices between two people, the social-haptic shared space concept evolved. This is a space where haptices are shared in a social environment and during activities together as agreed. When using touch, we need to agree the places on the body where haptices

are produced. This is called 'social body space', i.e., neutral areas of the body. Every producer and receiver of SHC need to be aware of this. The deafblind person who is using interpreting services can describe the methods they like to use onto their interpreter profile. They can also add if they like to use SHC and where, this is their neutral body areas. Every time we share haptices, we have a certain body orientation towards each other (free, in front, side by side, behind), body postures (standing, walking, sitting, laying down) and levels of body postures (same level, higher, lower). All these need to be considered when using SHC, and they are the essence of the adaptability of the system.

Haptices are articulated most often by hands, but also other parts of the body can be used such as the head (the receiver feels the head nod movement on their body), foot (foot to foot contact in YES), or shoulder (indicating turns in guiding). Every haptice has a built-in intensity that varies from light to neutral to heavy. While some haptices have a location-specific meaning (TIME/wrist, BLOOD PRESSURE/arm), many of the haptices have the same meaning independent of their location on the body. Handshape haptemes are related to the shape of the producer's hand when haptering. These include e.g. number of fingers (first finger, two or all five fingers) and shape and orientation of the palm. This category also includes the number of hands involved, one (direction-haptice) or two hands together (haptiering a room; orientation point and seats) at the same time. Some haptices are produced by an open palm (YES-haptice) or by one finger (YOU-haptice).

Some haptices can be diminished from using a flat hand (the palm or the back of the hand) into using one to five fingers. Haptic distance is the smallest distance between two touch surfaces that are separable. If the distance is smaller than the haptic distance, the two touches will fuse into one. This means we cannot perceive the number of fingers used if they are too close one to the other, for example when using one, two or three fingers to haptier YES or NO-haptice onto the person's body (Lahtinen 2008). Haptic distance allows one to use more than one finger to give the single, unchanging message. This difference is due to the density and distribution of touch receptors (mechanoreceptors) in the skin. Recently, research into human skin sensitivity and touch has grown greatly in many different research areas such as neuroscience and designing wearable multi-sensory haptic devices (see McGee 2018).

Movement is one the most important hapteme. Movement-related haptemes are directions of movement (up and down, horizontal, vertical, left, right, diagonal, circle, vibration etc.), pressure/intensity (light, medium, heavy), frequency, length, duration, pauses, rhythm, shape and size. Producers' size varies, but if we use a larger area in a haptice, it may intensify the meaning (small or large cup of

COFFEE). Figure 4 illustrates the relation between concepts of social-haptic communication, a coffee haptice (name of touch message) and haptemes (grammar elements of producing a coffee-haptice). Micro movements may be difficult to see and that is the reason why it is vital for the producer to experience the receiving of haptices as well. Length or duration of haptices can be long or short. If the movement in a haptice stops and the hand stays in contact with slightly increased pressure, it forms a question where an answer or feedback is required (Lahtinen 2008).

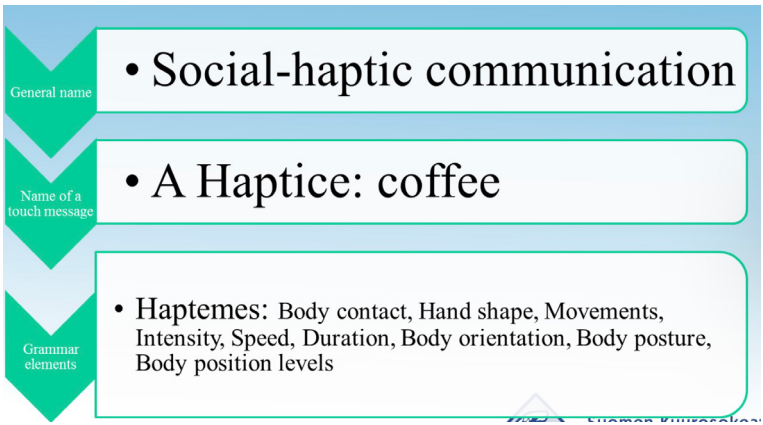

Figure 4 The relation between social-haptic communication, coffee-haptice and haptemes, i.e., the grammar elements

We can map the environment such as a room, a restaurant or a meeting room with haptices. That gives an overview of the surroundings and the spatial layout of the safe routes. This is done by locating on the map at least the following items and directions: the door, the furniture, the people in relation to the person and the amount of the objects. After the shape of the room, the receiver is placed in the room with STAND-haptice. This initial placement is followed by other items, such as doors/exits, tables or chairs and other items needed. The map may include the location of other people, and the more sophisticated maps include people moving around, entering and leaving the space. The body map may also include others' non-verbal feedback (SMILE, YAWNING, CRYING). A single haptice can also consist of many layers of messages simultaneously, such as the combination of confirmations and emotions (excited YES with stronger intensity), similarly to what happens when using speech or signing, our emotional state is involved (happy, sad, tired etc.) (Lahtinen 2008; Palmer, Lahtinen, Ojala 2017). Environmental haptices function from the receiver's perspective. Mapping proceeds logically from overview

to details. This helps the receiver build up a mental image of the space and be more independent in a social situation.

7 Conclusions and Future Considerations

This article has outlined more than 30 years of history and development of social-haptic communication. Over the past two decades, it has expanded to different countries and various client groups: from the deafblind people to the people with learning disabilities, the older people and other groups across disciplines in research. In decades of teaching SHC, it has become clear that producers must receive and analyse haptices themselves in order to understand how the grammar of touch is perceived through the skin.

Deafblind people and their family members find haptices as a new and flexible way to enrich the communication with spoken or signed languages. Haptices function either with or without visual and hearing aids, they function in the dark and in noisy situations. Social-haptic communication as a system has developed and now includes many lexical subgroups. It has been recognised both as a teaching aid for people with special needs, and in various rehabilitation programmes. It has also been included in sign language interpreter education and some Master's programmes.

The Social-Haptic conference in Venice in 2023 has highlighted how some countries have combined research and practice. The deafblind end users have made an important contribution in the development of haptices within the SHC framework. Dr. Elaine Comes Vilena published her doctoral thesis in Sao Paolo, Brazil in 2022. In Italy, Laura Volpato has finalised her doctoral thesis on haptices in 2024. Both of these researchers have involved the deafblind people to evaluate SHC as co-researchers. Many other countries have developed their own haptices dictionaries and vocabularies based on their everyday practical experiences. SHC has rapidly developed through different deafblind communities.

Over the past 10 years, SHC with deafblind people has expanded into research fields across the world. Recently a research group (GEPICH 2020 onwards) started to study and exchange information on social-haptic communication and inclusion through regular monthly online meetings. This includes professionals and deafblind users co-operating online by discussing and exchanging new ideas and applications to adapt SHC into their culture.

Recently SHC has been adapted and incorporated into technological devices, e.g. within the SUITCEYES project 2018-21 (`www.suitceyes.eu`). Haptices are the input for vibration-inducing sensors. A wearable garment will relay haptices remotely through vibrations (see Holt, Palmer, Lahtinen 2025). In the future, it may

be possible to use technology to experience gaming activities or the garment may help you to orientate in your surroundings. For example, a deafblind person could feel different haptices at a distance being stimulated through wearable vest using computer technology. It may be possible for some deafblind people to use this kind of technology to orientate and explore various gaming facilities (www.suitceyes.eu).

SHC increases effectiveness of communication with less energy, transmit confirmations, emotions and context in real-time. It can be invisible to others, keeping the experience more subtle. It expands the individual personal space and promotes interaction with others in social settings. One of the authors explains the importance of SHC in everyday life as follows: "Social-Haptic Communication is a part of my everyday life. As a deafblind user of SHC, the way I feel and see the world have made me realise that having the tools to communicate with people has been giving me new opportunities which I would not have dreamed of, especially academically and in my music. It allows me to be equal and gives me a rich quality of life taking in real time information spontaneously. More importantly, it enables me to use the interpreters and personal assistants in different situations allowing me to have more opportunities through arts and culture. Within my family, SHC has allowed me to have a more flowing and clearer communication avoiding misunderstandings".

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A Historic Perspective on Social-Haptic Communication in Norway

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Abstract This contribution presents the development and spreading of social-haptic communication in Norway. Haptic communication started at the end of the Nineties and since its beginning, it saw the cooperation between deafblind individuals and their interpreters. It is now part of the training of sign language interpreters. The Norwegian haptic signals have also spread to the USA, thanks to the translation into English of the book collecting the haptic signals used in Norway.

Keywords Social-haptic signals. Deafblindness. Visual impairment. Norway. Hapti-Co.

Summary 1 Introduction. – 2 The Beginning of SHC in Norway. – 3 SHC in the Training for Interpreters in Norway and Its Applications Abroad. – 4 Further Applications of SHC and Conclusions.

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1 Introduction

The authors of this contribution in a way witnessed the development and spreading of social-haptic communication (SHC) in Norway and try to provide an account for this in the present. SHC started at the end of the Nineties with the Norwegian deafblind woman Trine Næss and her cooperation with Riitta Lahtinen and Russ Palmer, now experts in the field of SHC. Trine Næss saw that the cooperation between deafblind individuals and interpreters was a key to further develop social-haptic communication in Norway. This vision became the most important pillar in the development of haptic communication in Norway.

In Norway, there are established regional interpreting services. Trine Næss started giving courses to those who were already educated and to those who went through training.

2 The Beginning of SHC in Norway

In the Nineties, Trine Næss observed what persons with deafblindness were doing to compensate for reduced vision and hearing. In 2006, she published a booklet with the title *To Grasp the Surroundings* (Næss 2006). In this publication, she systematized her findings, developed new signals, and established a system we continue to use today.

Unfortunately, Trine Næss died in 2008, and her wish was that her interpreters (later gathered in the company named Hapti-Co) continued with her project in collaboration with The Association for visual and hearing impaired/deafblind people (LSHDB). At that time, Hapti-Co consisted of three interpreters.

LSHDB and Hapti-Co have arranged courses for persons with deafblindness to give peer courses. Bibbi Hagerupsen, a deafblind woman, was one of the participants in our peer course program.

Bibbi Hagerupsen experienced haptic communication for the first time in 1999, during a workshop given by Trine Næss and Russ Palmer. Their workshop focused mostly on the description of images and music. “I don’t remember much of the content, but I remember well the experience of receiving descriptions on my back”, states Bibbi. During a workshop given by Trine Næss in 2004, Bibbi Hagerupsen got an epiphany. During a Deafblind International (DBI) conference later the same year, the interpreters cooperated with her to test out how to use haptic signals during presentations. Since then, there have been no way back. Bibbi Hagerupsen is now an important link to the deaf signing community, since she delivers courses to deaf individuals, so that the deaf community might be more aware and more accessible for persons with deafblindness.

3 SHC in the Training for Interpreters in Norway and Its Applications Abroad

In Norway, there are three university programs for sign language interpreters, providing haptic communication in their curriculum. SHC classes focus on learning the signals and emphasize the importance of cooperation between the deafblind person and the interpreter. When possible, classes are delivered by a person with deafblindness and an interpreter from Hapti-Co.

Hapti-Co continued Trine's work by giving lectures, but also wanted to fulfill her dream about a book of haptic signals. The dream was fulfilled in 2013, with the book *Haptisk kommunikasjon* (Haptic Communication) (Bjørge et al. 2013). During this work, Eli Raanes, a Norwegian professor at the Norwegian University of Science and Technology (NTNU) expert in the field of deafblind communication, was examining some papers at the Deaf museum in Trondheim and found a clip from 1864, describing persons with deafblindness receiving signals for yes and no (tapping and stroking). This is a nice little detail showing a bit of history and that communicating through touch can be dated far before the development of a standardized SHC system.

In 2014, the Helen Keller National Center invited Hapti-Co to present the Norwegian SHC system in the USA. In 2015, the book was translated and published in USA (Bjørge et al. 2015).

Both Trine Næss and we emphasize that a shared and standardized SHC system can ensure a fruitful communication for anyone who learns it, not limited by their first language. This means that most of the signals are the same in the Norwegian book and in the American version of the book.

In 2021, we launched a smartphone application with all the different signals which are in the book. This was done since paper-based books are not accessible for all, and technology is more available. We applied for funding through the same foundation who supported the book, DAM with the support of LSHDB. The application Haptics: Pocket Edition functions like a list of words, describing every signal by pictures, videoclips, vocal and written descriptions. Our aim was to make it as accessible as possible. The app is now available in both Norwegian and English.

4 Further Applications of SHC and Conclusions

People with deafblindness may enjoy different life and sport activities. Therefore, in collaboration with the deafblind community, dedicated haptic signals have been created and collected in small booklets. New signals regard, for instance, hiking, attending sports events, working

with guide dogs (see the chapter by Cathrine Timm Sundin and Nina Frisnes Øyan in this volume) and other areas where the community itself experiences a need or a wish for communication.

For many years, haptic signals were mainly used only within the deafblind community in Norway, but in recent years, people with visual impairment have started to use them as well. The National Blind Association have invited us to give courses on both regional and local rehabilitation centres. The Association realized that haptic signals could be a useful tool to compensate for people's visual impairment and reduce some of the obstacle they may find in everyday life.

As a final note, we would like to emphasize that haptic signals should be useful for the individual and that we are all different. Some people only use a few signals, and others use all those that have been created so far.

In our opinion, nobody owns haptic signals, rather they are a free communication tool to bring people together.

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Development of Social-Haptic Communication in the Netherlands

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Abstract Following the inspiring Hapticconf conference in Venice in September 2023, we would like to contribute by sharing our experience. In our contribution, we would like to highlight two key aspects: firstly, the role of experts by experience in the development of SHC in the Netherlands, and secondly, the materials we have developed for the SHC training courses we offer.

Keywords Social-Haptic Communication (SHC). Experts by experience. SHC training materials. Inclusive communication. Netherlands.

Summary 1 The Role of the Expert by Experience in the Process of Development of Social-Haptic Communication in the Netherlands. – 2 The Material Developed for Delivering SHC Courses. – 3 Future Developments and Comments of Hapticconf 2023 Conference.

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1 The Role of the Expert by Experience in the Process of Development of Social-Haptic Communication in the Netherlands

The Netherlands project group for social-haptic communication (SHC) was formed in 2015. The group consisted of a representation from various organizations that work with people with deafblindness, both experts by experience and employees. The experts by experience are deafblind persons who have played an important role in the development of haptices for the Netherlands.

After learning and experiencing about SHC, the group selected words that would enrich communication and were therefore important to develop haptices. The project group collected as much material as possible from other countries such as Finland, Denmark, and Belgium where SHC manuals had already been created. We reviewed them and decided that they would allow us to make good choices for our haptices. Then we paired up (an expert by experience with a teacher), and we asked the expert by experience to receive/feel all the haptices that had already been developed. Subsequently, these experiences were discussed together in the group, and a new haptice for the Netherlands was regularly added. The experts by experience had the final say in the choice of (usually) one haptice for one word. Since every expert by experience has his or her own background, during the development of new haptices, there was often a difference in preference between someone who was born deaf or someone who was born blind. This often resulted in very inspiring conversations, sometimes resulting in us developing two haptices for one word.

The expert by experience also has an important role during training courses, which are almost always delivered by a teacher and an expert by experience together. Often, the deafblind expert can say a lot about the use and benefits of SHC from his/her own experience, and this is a very valuable addition to the training. Experts by experience also offer valuable support in developing bodynames, that is, haptic names used to refer to specific persons.

During individual training sessions, the role of an expert by experience may vary. Sometimes participants struggle with meeting someone who also has a hearing and vision disability, or it is still too complicated or confrontational at that moment. This is why, in these individual training sessions, participants' wishes regarding the involvement of the expert by experience are always discussed before the start. It is regularly agreed upon that the expert by experience can be present one or two times during the whole training. The presence of the deafblind expert is often perceived as positive because questions could be asked directly to him/her, and it is possible to try out haptices with someone who already has a lot of practice. It is also nice for the participants' network to witness that

you can still communicate with someone in this way when they see less and hear less.

2 The Material Developed for Delivering SHC Courses

After a two-day training at the end of 2015, led by Russ Palmer and Riitta Lahtinen (both SHC trainers; Russ Palmer is also an expert by experience; see Palmer, Lahtinen 2015), the project group went on to develop its own Dutch SHC course materials. These materials consist of (i) a manual for teachers who want to deliver a basic SHC course; (ii) a manual for SHC students; and (iii) a SHC handbook.

In the teachers' manual, lessons are described in detail. In each session, lesson goals are stated, theoretical background information is provided, and exercises and assignments are specified. This manual represents a guideline for any SHC teacher.

In the students' SHC manual, lesson goals are described as well as the theory that is discussed in each session. Haptices and homework are included as well.

The SHC handbook simply contains all the haptices we have developed. For each haptice, there is a photo with a description of how the haptice should be performed.

All three books have been published in different formats: standard font, large font, and braille version with a tactile-version of the pictures in order to feel the hand-shapes.

For both the teachers' manual and the students' manual, we have also prepared an adapted SHC training for people with deafblindness and intellectual disability. The target group is highly diverse, ranging from individuals with mild to profound intellectual disabilities, and from congenital to acquired deafblindness. These different factors have a significant impact on how communication is learned, understood, and applied. This will always have to be taken into account when using SHC. This course is offered to the deafblind person's network and to healthcare professionals.

There are similarities and differences in the application of SHC to people with and without intellectual disabilities. In the training for people with intellectual disabilities, the emphasis is on their own experience, where the personal profile is leading, instead of the focus on providing information about the social environment. For people with intellectual disabilities, it is important that haptices are offered in a clear and consistent way: with the right movement, frequency, size, and at a fixed location on the body. This is often the body area where the activity or movement represented by the haptice takes place. This information is described in the personal profile. Examples of haptices for people with deafblindness and intellectual disabilities are the use of tactile messages on the part of the body where the

action takes place. For example: tapping on the foot when the person should put on a shoe; a gentle tap on the hip to ask the person to sit down; or a gentle tap on the head to indicate that it is raining. For example, the haptice JACKET ON is performed on the shoulder, while the haptice LAUGHTER is performed on the stomach. Only under these conditions are haptices well understood, and only in this way can they be used effectively (Palmer, Lahtinen 2017).

This differs from haptices used for people without intellectual disabilities, where there are much stricter agreements about where on the body a person may be touched to convey a tactile message.

Some similarities are that we work with both haptices and haptemes with both deafblind individuals that have or do not have intellectual disabilities, and that for both groups, SHC is a complementary form of communication and there is always respectful contact.

After completing the basic course, it is possible to schedule a follow-up session to refresh previously learned haptices and to learn additional haptices. For this purpose, a supplementary manual has been developed, including photos and descriptions of all the extra haptices.

At the request of participants, we can develop new haptices, which we design in collaboration with the project group. In doing so, we always carefully assess whether the new haptice is a generally applicable addition or it is a haptice that is specifically tailored to an individual personal profile.

We also developed additional materials such as flyers about Dutch SHC and workshops of one or two hours.

3 Future Developments and Comments of Hapticconf 2023 Conference

After we started as a project group in 2015, we have seen great developments. For example, SHC is becoming more and more well-known in the Netherlands, and it is being used and applied by more and more people. We are also receiving more requests for training courses and workshops.

The collaboration with the experts by experience within our project group has been and will always be essential to us. Of course, the development of materials is also constantly evolving. For example, we are currently investigating whether it is possible to develop an app for Dutch haptices.

The conference in Venice greatly contributed to establishing international connections. Attending the various presentations was very educational; it provided us with new insights into how SHC is used in other countries, what developments are taking place there, and so on. For example, it was fascinating to see that SHC can also

be used to explain the concept of the galaxy (see the contribution by Russ Palmer and Stina Ojala in this volume).

This gave us valuable insights into using SHC in ways that differ from our usual practices. Through conversations, presentations, and insights we received upon our return, we immediately began investigating whether developing an app for SHC within the Netherlands could be feasible and how we could approach it. The conference helped us take more action on this.

Thanks to the conversations, presentations, and new perspectives we gained, we immediately began exploring how we could raise more awareness of SHC and make it more accessible within the Netherlands. The conference helped us take concrete steps in that direction.

For a future conference, we would appreciate seeing more space in the program for breaks, which are especially important for people with hearing and vision impairments and their interpreters.

We also hope that more time will be allocated for personal contact and networking, to facilitate even greater knowledge exchange.

Above all, we hope that another SHC conference will be organized soon, where we can meet again and continue learning from one another.

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Building Up Social-Haptic Signs: The Portuguese Team

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Abstract Social-haptic communication (SHC) enables interaction for Deafblind and Deaf people with low vision but remains underutilized in Portugal due to geographical dispersion and lack of specialized training. This paper examines work from March to November 2022 within the international *Social Haptic Signs* project, documenting 24 haptic signs used by Portuguese Deafblind people, contributing to 80 national haptic signs published by the project. It details this pilot initiative's methodology and aims to advance understanding of SHC's importance for improving communication accessibility among the Deafblind community in Portugal.

Keywords Social-haptic communication. Portuguese haptic signs. Deafblind people. Portuguese Deafblind. Teamwork dynamics.

Summary 1 Introduction. – 2 Social-Haptic Communication: Challenges and Innovations during the COVID-19 Pandemic. – 3 Social-Haptic Signs: Establishing the Project. – 4 The Phases of the Project. – 4.1 Creating the Workgroup Dynamics for Data Collection. – 4.2 Filming and Describing Haptic Signs: Ensuring Deafblind Representation. – 4.3 Final Discussions and Creating Haptic Signs Categories. – 5 The Several Impacts of the SHS Project. – 6 A Letter to the Future: Portuguese Protactile. – 7 Conclusion.

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1 Introduction

Social-haptic communication (SHC) is a communication modality that facilitates interaction for Deafblind individuals or Deaf persons with low vision by combining tactile signs and haptices (Lahtinen, Palmer 2008). Despite its potential, Portuguese Sign Language (LGP) and SHC remain underutilized in the Portuguese context, largely due to challenges such as the geographical dispersion of Deafblind people across Portugal and the scarcity of specialized training available in LGP and SHC for professionals working with this community. Additionally, the notable lack of comprehensive demographic data on Deafblind individuals in Portugal, both in national censuses and academic research (Instituto Nacional de Estatística 2021), not only hinders the development of projects in this area but also limits the ability to implement actions aimed at improving the quality of life of Deafblind and low vision people in Portugal.

Despite challenges in implementing deafblindness-related projects, some initiatives exist. This paper offers a reflective overview of the Portuguese team's participation in the Erasmus+ project *Social Haptic Signs for the Deaf and Blind in Education* (SHS), focusing on collaborative efforts from March to November 2022. These efforts resulted in documenting 24 haptices or haptic signs, later included in a published set of 80 national haptic signs (see `https://spreadthesign.com/pt.pt/social_haptic/`). By reviewing this collaboration and its outcomes, the article aims to advance understanding of SHC and its role in promoting communication accessibility for Deafblind individuals in Portugal.

A person is considered Deafblind when, due to partial or total loss of hearing and vision, they adapt communication methods and ways of accessing the environment, including information and mobility. Our team has agreed to use an uppercase 'D' in 'Deafblind' inspired by a convention established in Deaf Studies since the 1970s (Woodward 1972) that intentionally serves as a marker of identity for Deaf individuals. Therefore, our definition of 'Deafblind' not only follows what has been recognized by the European Parliament (2004), but takes it a step further, as we believe that the use of the uppercase underlines the cultural and identity-based features that distinguish the community as a minority group in its own right, consistent with conventions applied to other minority and cultural groups, as is the example of the Deaf Community (Ladd 2003; Gil 2020). Deafblind, as an umbrella term, is multifaceted, as it is considered not merely the sum of blindness and deafness, but instead constitutes a unique condition (Nordic Leadership Forum on Deafblindness 2024). The term also emphasizes identification with the Deafblind Community and mastery of a variety of communication forms, including, among others, both tactile and visual sign languages. Despite this, we also

recognize that "[o]lder adults with acquired impairments are unlikely to identify with the label *deafblind*, having lived most of their lives with functional sight and hearing, and being more comfortable with the term *dual sensory impairment*" (Wittich, Dumassais 2025, 2). Some Deafblind individuals, particularly with Usher Syndrome, may also identify as members of the Deaf community (Wittich, Dumassais 2025). Although the analogous distinction between 'Deaf' and 'deaf' has generated debate in academia due to its potential to create divisions and categories (Kusters, De Meulder, O'Brien 2017), many scholars maintain its relevance (Ladd 2003; 2022; Gil 2020). The intention is not to homogenize the diversity within the Deaf Community, nor, by extension, within the Deafblind Community.

In Portugal, apart from Gaspar et al. (2015), who studied a sample of 135 Deafblind individuals, no demographic studies report the number of Deafblind people. Also, a few institutions and organizations exist attended by Deafblind people offering support, education, or training, and promoting gatherings, however remaining 'invisible' to a great part of the population and policymakers.

2 Social-Haptic Communication: Challenges and Innovations during the COVID-19 Pandemic

This paper, rooted in the SHS project, aims to challenge the social *invisibility* of Deafblind people by involving them directly in the research and development group and by giving them a role in its development. Key stakeholders involved include Deafblind individuals, professionals working with them, and organizations supporting sign language accessibility and research for the Deafblind community.

SHS was initially proposed as a 36-month project, from September 2019 to August 2022, but in March 2020, the COVID-19 pandemic led to health and sanitary curfews and social isolation. Schools were shut down; universities, associations, and other organizations followed similar paths, putting projects, works, and studies on hold. Due to delays in project implementation, a three-month extension period was requested and granted by the Swedish Erasmus+ National Agency, postponing the project's conclusion to November 2022. During the pandemic, social isolation severely hindered not only formal but also informal learning practices in schools; the lack of physical contact and adequate resources for communication during that time aggravated the vulnerability of Deafblind students (Almeida, Cruz-Santos 2022).

The World Health Organization (2020) recommended to "[d]evelop accessible written information products by using appropriate document format (such as 'Word'), with structured headings, large print, braille versions and formats for people who are deafblind". However, these recommendations did not take into account that many

Deafblind people rely on tactile interactions, such as sign-based communication that requires body contact between at least two interlocutors.

Haptic signs are touch-based messages exchanged between two or more people, typically tapped or drawn on the body. Common articulation sites include the back, arms, and knees, though less frequent locations may be used depending on the interlocutors' familiarity and the communication method or pattern.

To meet its objectives, the project teams needed to engage directly with Deafblind individuals – the primary target group – either individually or in small groups, including private individuals and those attending schools or institutions. However, as many Deafblind people rely on direct touch for communication, such as hand-to-hand contact, and numerous Deafblind institutions were closed, the teams were unable to conduct research and development activities as scheduled. This situation led the project onto an unexpected path, presenting new challenges but also a valuable opportunity for social reunion and meaningful involvement of Deafblind participants in the project's post-pandemic development process.

3 Social-Haptic Signs: Establishing the Project

Providing some context, the international project *Social Haptic Signs for the Deaf and Blind in Education* (SHS) (2019-1-SE01-KA201-060404) was an Erasmus+ initiative involving teams from Estonia, Italy, Portugal, and Sweden. The project traces its origins to the multilingual online sign language dictionary Spreadthesign (`www.spreadthesign.com`). Spreadthesign provided the foundation for expanding accessible resources, and within the framework of the SHS project, the main objective was to investigate the specific field of social-haptic communication.

The SHS project aimed to identify, systematize, classify, document, and make accessible the haptic signs used by and with Deafblind individuals in the participating countries, including Portugal. Another objective of SHS was to create visual materials, including photos, videos, and written descriptions detailing the execution and usage of haptic signs.

The Portuguese team faced the challenge of compiling these resources and disseminating them to a diverse audience, which included professional and in-training LGP interpreters, established professionals in the field, students of sign language interpretation, families, associations, schools, and individuals working with Deafblind people. The overarching aim was to publish the project outputs online free of charge, maximizing accessibility both to specific members of the public with Deafblindness and to wider audiences as a way of

raising awareness on the theme. In this context, this article serves as an additional outcome, enriching the team's efforts and contributions to the field.

The ideas and conditions for this project emerged in the confluence of several factors. First, there was the urge to add new features to the international dictionary Spreadthesign, to address new problems and provide adequate resources, to reach more diverse publics, and to expand its range in terms of social usability and visibility. The ideas were launched by the project coordinator from the European Sign Language Centre, discussed with the partners, and developed until the final version was included in the project application.

Second, the involved partners, experienced organizations, and those with expertise working with Deaf communities, also felt the desire to approach Deafblind communities, seeking to understand and deepen knowledge about Deafblind people's communication channels and means to access surroundings, provide useful resources, and raise awareness about these communities to a wider spectrum of the population.

Third, and in what relates to the Portuguese partner, the participation was facilitated by previous interactions and collaborations with an enthusiastic Deaf and low vision student at the University of Porto, César Casa Nova, who promptly manifested interest in participating in such a project and who was eager to share his story, learnings, and to contribute to the partnership. As a Deafblind person with severe and progressive vision loss, César is more reliant on tactile and supported sign language and frequent use of haptic signs. César Casa Nova became a valuable asset and contributor throughout SHS, assuming the role of advisor, tester, and actor in videos.

The SHS project began in September 2019, with teams initiating work plans. In November 2019, partners convened for the kick-off meeting to outline subsequent steps. However, in March 2020, while preparing for the second international meeting, the COVID-19 pandemic was declared worldwide.

Between March 2020 and the beginning of 2022, very few implementation actions could be taken. The consortium kept continuous communication procedures via e-mail and several online meetings (Zoom or Skype) to check on the progress made and devise plans for the 're-opening'. These meetings facilitated sharing each team's internal advances – namely contacts established with Deafblind organizations and other institutions –, discussing aspects related to research and production, such as details concerning the production of videos, photos, written descriptions, technical aspects to implement on the website, and refining details related to project aims, target groups, outputs, among others. Nonetheless, the substitution of in-person project meetings with online ones has made

it longer for the partners to build common ground for understanding and to share filming practices.

In addition, between November and December 2020, the partners conducted four online training sessions on social-haptic signs: haptices and haptemes[1] (Lahtinen, Palmer 2008). The trainers were Riitta Lahtinen (PhD, senior researcher) and Russ Palmer (Deafblind, International Music Therapist and Vibroacoustic Therapy Practitioner), both experienced researchers and experts in haptic communication,[2] and members of the Social-Haptic Communication research group at the University of Helsinki, Finland.

Despite plans to 'reopen', worsening sanitary conditions in several countries, including Portugal, forced a postponement of project activities until early 2022. By then, the teams' work had been severely impacted, disrupting planned activities and limiting the project's full potential in research, production, and dissemination.

The Portuguese team at the time held periodic online meetings to outline future steps of the project, to discuss matters approached in the international online meetings and contextualize them according to national reality, to provide feedback to the partners and project coordinator, but also to identify specific contact persons and organizations to collaborate in the stages ahead. The contacts were then established with stakeholders, who later integrated the Portuguese team. The Portuguese team's Deafblind advisor, César Casa Nova, and his interpreter, Ana Oliveira, were involved from the start. However, due to the restrictions, the Deafblind advisor was unable to participate in the online meetings and contributed mainly remotely via messages and videos supported by an LGP interpreter.

1 'Haptemes' are the basic tactile units or variables of touch – such as location, pressure, and movement – used to construct 'haptices', which are single, meaningful messages transmitted through touch on the body. Together, haptemes form a structured system enabling complex, multidimensional social-haptic communication (Lahtinen, Palmer 2008).

2 At times, we question the use of the word 'social' in the designation of this form of communication, since all communication is inherently social. Consequently, we sometimes deliberately omit the term 'social' when referring to communication using haptic signs, although we remain aware that it is present in the concept's origins and is the term used by the project and its members, as well as in the official project title.

4 The Phases of the Project

4.1 Creating the Workgroup Dynamics for Data Collection

After the semi-lockdown ended, collaboration unfolded in various stages involving multiple stakeholders from three national institutions: a Deafblind university student, Deafblind youth, several LGP interpreters, LGP teachers, educational technicians, and academic researchers.

Two of the article's authors are team members and stakeholders who later joined the project. The first author of the paper, Cristina Gil, has experience as a former sign language interpreter for the Deaf and Deafblind. She is also a researcher on Deaf Culture and a higher education professor specializing in Sign Language Translation and Interpretation. The third author, Paula Liques, is an educator and Pedagogical Director of an organization with extensive experience in education and training of Deafblind children, youth, and adults working at the Center for Education and Development António Aurélio da Costa Ferreira of Casa Pia of Lisbon (CED-AACF). The second author, Bruno Mendes, and the fourth author, Orquídea Coelho, were involved in developing the project from the outset. By integrating these additional elements, as well as involving more Deafblind people, Deaf teachers Ana Ferreira and Pedro Oliveira, along with staff members from CED-AACF, the SHS project gained renewed momentum, bringing together research expertise, practical knowledge and direct feedback from the Deafblind community. This rapidly established platform of mutual understanding fostered a durable synergy leading not only to the achievement of the SHS project's goals, but also to ongoing collaboration. We detail this collaboration below.

Between March and April 2022, biweekly team meetings were held with three members from CED-AACF. These sessions aimed to contextualize the project and introduce the concept of social-haptic communication. Information from the meetings was conveyed to their institution, prompting internal reflection on communication and guidance practices among the socio-educational team (teachers, technicians, and other personnel). Consequently, participants embraced the challenge to collect and systematize the haptic signs used at CED-AACF. To facilitate this collection, we created a table for the from CED-AACF's team to record specific information, including:

a. the context or area in which the haptic signs are used;
b. the semantic designation of each haptic sign, typically corresponding to an action, behavioral command, or information about a specific event;

c. a description of the haptic sign's execution, including the part of the body involved;
d. Deafblind individuals who use the haptic signs;
e. staff members familiar with those haptic signs used with the specific Deafblind individuals.

Below figure 1 shows an excerpt of the data collection table used by members of CED-AACF. For ease of reading, it has been translated into English from the original Portuguese. The names of participants have been anonymized. The text highlighted in *green* indicates touch-based messages identified as haptic signs and approved for filming.[3]

Haptic Signs – Table for data collection

Where?	What?	How?	Who?		Name of the video file	Registered by	Obs.? Y / N
Context/Area	**Concept/Sign**	**Short Description**	**Young Deafblind**	**Intervenient**			
Residential Care Home	(Bath) Wash the head	Massage the head with the fingertips	*"NAME"*	Special Education teacher (DEE) *"NAME"* + young deafblind *"NAME"*	1. Wash the head	DEE *"NAME"*	N Supported LGP
	Touch with intention	An assertive touch, normally in the hands of the young deafblind, so that he/her perceives that an unpleasant behaviour must stop.	All young deafblind elements	Teacher "NAME"	2. _____	*Teacher "NAME"*	Y HAPTIC SIGN *Variants (hand, shoulder leg)
Guiding and mobility	Go up	Slightly raise the elbow	*"NAMES"*	Special Education teacher (DEE) *"NAME"* + young deafblind *"NAMES"*	3. Go up	DEE *"NAME"*	N Not applicable
	Go down	Slightly raise the elbow	*"NAMES"*	Special Education teacher (DEE) *"NAME"* + young deafblind *"NAMES"*	4. Go down	DEE *"NAME"*	N Not applicable

Figure 1 Table for Data Collection of Haptic Signs. 2022. Digital Document. Erasmus+ project *Social Haptic Signs for the Deaf and Blind in Education*

The internal collection process happened between May and June 2022, involving 16 individuals, including teachers from various areas of expertise and senior technicians. In addition to the table, staff members recorded videos demonstrating the haptic signs in different contexts, showcasing their execution. The team was also able to gather some haptic signs used by Deafblind young individuals and their family members. About 28 homemade videos were recorded by educators and staff to register their practices, which became fundamental material to ascertain and clarify some movements and touch-based messages described in the table, and to discuss which could or could not be considered as haptic signs.

3 All images – except where otherwise specified – are the Authors' own elaborations.

In total, approximately 50 haptic signs were collected, irrespective of their use and purpose at the time of collection. These signs were then discussed in several team meetings during June 2022. This discussion resulted in the selection and confirmation of 24 haptic signs, including variants that were performed similarly in different locations on the body. Some haptic signs were excluded based on various relevant considerations, such as simple touching or redirecting movements, the transposition of LGP lexicon to different body parts without appropriate haptic adaptation, or the locations on the body used to convey information that conflicted with linguistic and cultural norms established within Deaf and Deafblind communities (e.g., head or face).

The detailed table descriptions, videos, and research team experiences were essential for discussing and clarifying the contextual meaning and use of signs. Furthermore, the collaborative approach and meticulous attention to detail, often overlooked early but burdensome later, enabled the careful curation and refinement of the small corpus of emerging haptic signs, which became part of the Portuguese team's outputs.

4.2 Filming and Describing Haptic Signs: Ensuring Deafblind Representation

Following the completion of the data table and final refinements, two filming sessions were held in July 2022. The participants included a Deafblind university student (advisor/actor), two young Deafblind individuals from the educational institution, two Deaf LGP teachers, and one LGP interpreter for the Deafblind. The inclusion of Deafblind participants was a prerequisite established by the team to ensure visibility and representation for the Deafblind community, thereby enhancing the project's legitimacy. Recognizing their privilege, the team acknowledged the necessity of incorporating Deafblind individuals into the process (McKee et al. 2013; Crowe et al. 2022). The involvement of a Deafblind advisor throughout the project and Deafblind participants during the recording phase notably enriched the discussions and contributions. Moreover, including Deafblind individuals in the recordings was crucial not only for the overall quality of the final product but also for ensuring political representation, underscoring the significant implications of this seemingly simple detail. Following Bourdieu (1991) and empirically, how we believed the project should be carried out, we implemented this inclusive approach well before consulting recent research, and only later, during the writing of this article, did we discover that Watharow and Wayland (2022; 2024) highlight these considerations specifically for the participation of the Deafblind community.

These two sessions were essential for filming the haptic signs and reviewing the entire collaboration process, the resulting products, and their implications for the research team, the educational institution, its staff, and Deafblind users. The filming followed guidelines previously agreed upon by all international partners of the SHS project and shared with the teams' Deafblind advisors and technical experts, whose specific feedback led to some suggestions being implemented, while others were not feasible. Those guidelines encompassed orientations regarding:

a. background scenario: it should be green, although it was not possible to use the 'chroma key' effect due to technical, financial, and time constraints – we remind that filming sessions of almost all partners started within the project's final year.
b. lighting: whenever possible, multiple spotlights should be used to avoid shadows; being visual outputs, either static (photos) or in movement (videos), the materials should be as unequivocal and detailed as possible regarding all their elements and performance.
c. clothing: actors should wear black long sleeve shirts, without buttons, branding or artifacts susceptible of interfering with the visualization of the videos or photos; pants or jeans should be colour differentiated (e.g., light blue vs dark blue or light blue vs black), not only to distinguish the lower limbs of each actor while siting for haptic signs tapped or drawn in the thighs or legs, but also to create contrast between the fabrics and the signers' hands; reflective materials such as jewels or glasses should also be avoided to prevent light reflection.
d. body positioning: the signers' hands and body location should be visible to allow people to see handshape, movement and location; this applied to all kinds of haptic signs, whether tapped or drawn in the back, shoulder arm, hand, thigh or leg, chest, or even head, and whether performed standing or sitting, facing towards the camera or the screen.
e. signing pace: actors' movements while performing the haptic signs should be done calmly, not rushed, permitting the public to grasp the handshape, movement, and location, to reproduce the haptic sign in the best way possible.
f. camera's centering and focus: filming staff should be attentive to the actors placement regarding the background scenario (and lighting), to capture all the haptic sign execution and avoid blurred or covered signs; for signs performed standing, all the upper body and head should be within the video frame, and signs done sitting, the body parts below the knees should not be framed, except in the cases in which the signs are performed in the feet.

After filming, videos and photos were edited, adding arrows to represent hand movements. Photos were edited using free software GIMP – GNU Image Manipulation Program, and videos were edited using Adobe Premiere Elements. Each haptic sign was described to indicate how it is performed, detailing handshape, movement, and body location. Some signs required specific contextual information, particularly those used in educational or familial settings, which may or may not apply to the broader Deafblind population. Since the descriptions would also become available to non-technical and non-scientific audiences, the teams were instructed to avoid complicated and technical terminology.

For the description phase, we consulted reference books on LGP to identify and describe handshapes and movements. The first of these books is the *Gestuário* (Ferreira, Fernandes 1991), the first LGP dictionary, which consists of a collection of LGP signs and their description and illustrations; the second book is *Para uma Gramática da Língua Gestual Portuguesa* (Amaral, Coutinho, Delgado-Martins 1994), which introduces the linguistic and grammatical analysis of LGP. Below we show an example of how *Gestuário* was helpful in this work:

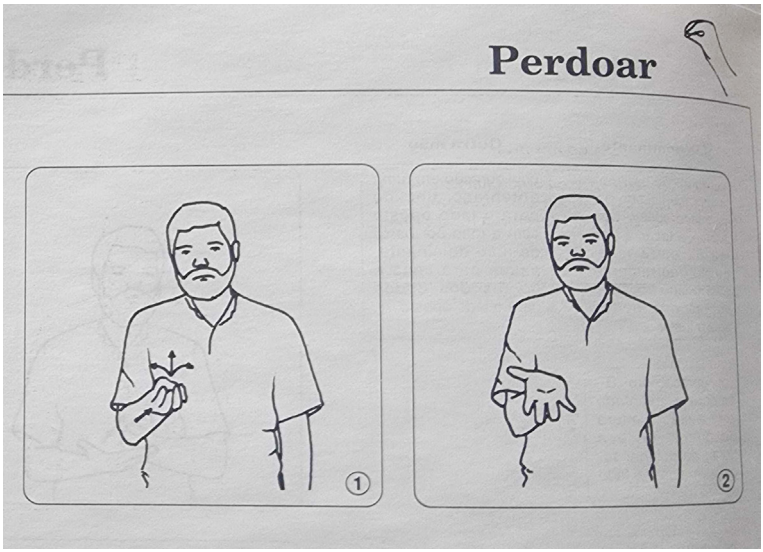


Figure 2 Visual description of FORGIVENESS (*perdoar*) (Ferreira, Fernandes 1991, 542)

Figure 2 depicts an arrow accurately illustrating the movement execution. Although the handshape and movement match those of the haptic sign we aimed to describe, this is not the same sign, as this

is the LGP sign for FORGIVENESS, which is not a haptic sign. Figure 3 shows an example from the website,[4] where the same type of arrow and movement is used:

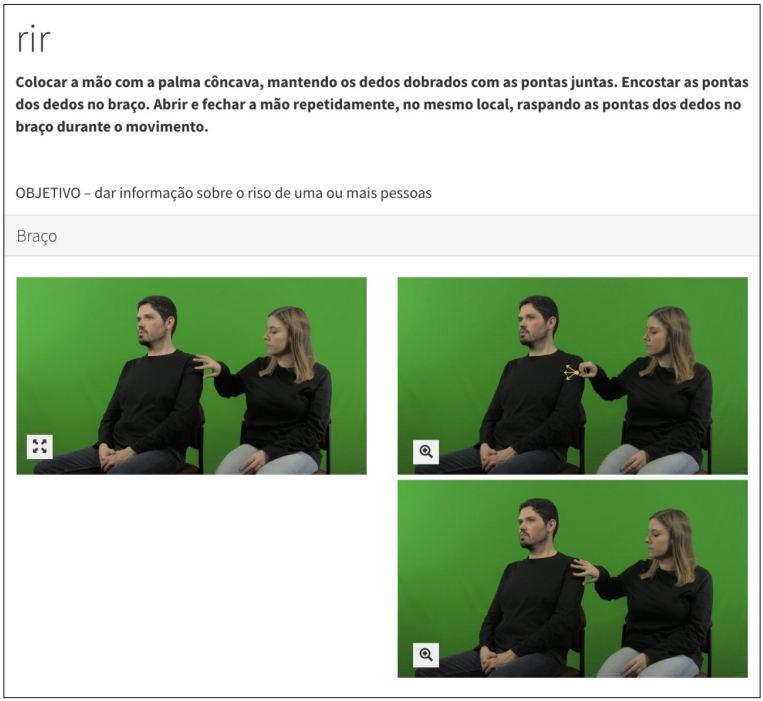


Figure 3 Portuguese haptic sign for LAUGH (*rir*). From the category "States and Emotion", we illustrate how the arrow was chosen, aligned with the *Gestuário*. The description above the images states: "Laugh: Place the hand with the palm concave, keeping the fingers bent with the tips together. The fingertips touch the arm. Open and close the hand repeatedly in the same spot, scraping the fingertips on the arm during the movement. OBJECTIVE – to convey information about the laughter of one or more people"

The book *Para uma Gramática da Língua Gestual Portuguesa* was invaluable in grounding the team in LGP linguistics, especially for those members who were less familiar with it. It clearly outlined LGP phonology, describing handshapes, locations, and movements, greatly informing team discussions. For certain specific haptic signs, consulting these books facilitated problem-solving by providing clarity and solutions.

4 https://spreadthesign.com/pt.pt/social_haptic_signs/STATES_AND_EMOTION/347?q=&page=1.

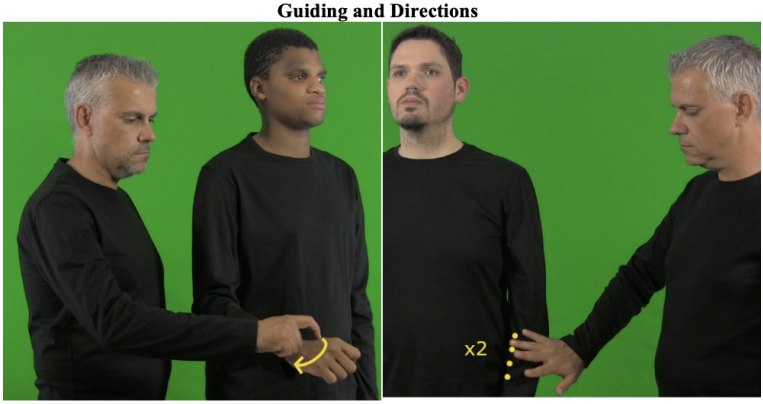
4.3 Final Discussions and Creating Haptic Signs Categories

Between September and November 2022, the team reconvened to review the final products (videos, photos, descriptions) before publication on the project platform. This phase included re-filming some videos that failed to meet quality standards. The team met eight additional times, via virtual or on-site sessions. In each meeting, members ensured consistency with prior decisions, followed established description guidelines, using clear, accessible language that emphasized iconicity in handshape and movement descriptions (e.g., V shape, U/O shape), while avoiding technical or linguistic terms.

During revision, every detail was considered and finalized, from the designation of each sign to the corresponding description, crafted to be concise, clear, and accessible, along with the performance of the signs in the videos and photos. In total, the Portuguese team produced and published 80 haptic signs, from which 24 were collected through the process described in this article. The remaining 56 signs were documented and filmed by another Deafblind team member in collaboration with an LGP interpreter. Those haptic signs arose from his social-haptic communication with interpreters in various settings, including university classes, national and international conferences, cultural activities, and friendships with other Deafblind individuals. Given his social and cultural experiences, he could more easily document a greater number of haptic signs he has used over several years. It should be stated that all 56 signs documented outside the teamwork dynamics previously described were also subject to the same discussion and revision process by the team.

The description and classification stage also served to categorize and frame the haptic signs according to a list of 15 categories defined by the project partners in earlier phases. These categories, which were established based on research as well as emerging types of signs and signing contexts, include *Social Quick Messages*, *Guiding and Directions*, *Environmental Descriptions*, *Descriptions of Objects*, *Descriptions of Persons*, *States and Emotions*, *Cooperation with Interpreters*, *Food and Beverages*, *Weather*, *Colors and Patterns*, *Healthcare*, *IT and Technology*, *Letters*, *Numbers*, and *Other*. Additionally, the signs were classified according to the filming position (*Standing – Side*, *Standing – Behind*, *Standing – Front*, *Sitting Side by Side*) and the place of articulation/body location (*Head/Forehead*, *Face*, *Neck*, *Chest*, *Back*, *Shoulder*, *Arm*, *Forearm*, *Hand*, *Leg/Thigh*). Next, we present a collection of photos of haptic signs, of different categories, published by the Portuguese Team and available at the link `https://spreadthesign.com/pt.pt/social_haptic/`.

Guiding and Directions

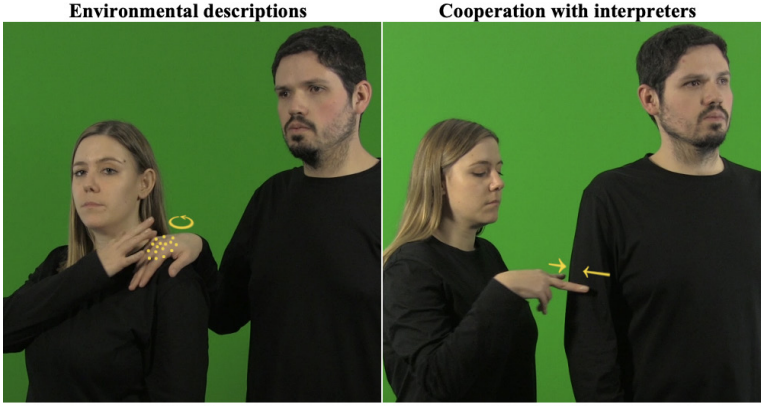


Draw an arc with the cane | Stairs

Social Quick Messages

Emergency | Thanking

Environmental descriptions | **Cooperation with interpreters**



Crowd | Interrupt/Break off

States and emotions

Laugh

Descriptions of Objects

Clothes worn inside out

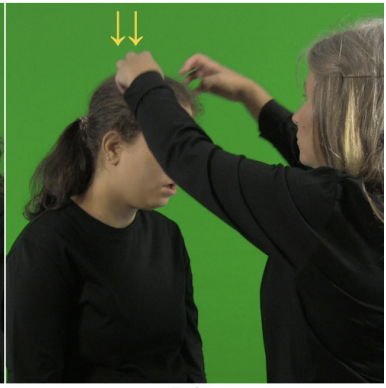
Food and beverages

Soup

Healthcare

Covid-19 test

Weather



Rain

Figures 4a-g Examples of pictures with a collection of haptices from each category

5 The Several Impacts of the SHS Project

From a meta-reflective perspective, this collaborative effort to document and develop haptic signs within Portugal has yielded various impacts and implications.

Firstly, the project has validated the work conducted at the CED-AACF for Deafblind. Feedback from staff, gathered on multiple occasions, revealed that their involvement prompted critical reflection on their practices and highlighted the need to continue enhancing communication and accessibility. While many staff were familiar with the touch-based messages, they previously lacked awareness of the importance of social-haptic communication for Deafblind people.

A notable finding concerns the potential of haptic communication in interactions with young Deafblind people in moments when they are engaged in physical activities: staff members add haptic information directly on the body while performing other actions, avoiding interruptions through hand-in-hand communication. For example: 1) during a Polybat game (adapted table tennis), the ball trajectory is signaled on the player's back to aid defense without hand contact; 2) while kneading clay with dirty hands, instructions on when to turn the clay or add water are given on the forearm.

Secondly, the project has facilitated essential collaboration between academia and educational institutions serving Deafblind people. This partnership deepens understanding of Deafblind communication access and fosters knowledge production that positively affects Deafblind lives. Crucially, including Deafblind individuals throughout the process grants them agency and ensures community visibility and recognition.

Finally, the initiative has created a national database of haptic signs to be used by educators, families, and others with minimal communication skills. It also supports educational purposes, such as training sign language interpreters specializing in Deafblind communication, thereby enhancing their professional skills. Looking forward, organizing nationwide Deafblind meetings is a key priority to encourage the emergence and development of additional social-haptic signs for integration into this database.

This article reports that the project significantly impacted practices at CED-AACF by prompting in-depth reflection on social-haptic communication with Deafblind pupils. This reflection was fostered through internal dissemination led by Paula Liques and LGP teachers Ana Ferreira and Pedro Pereira, enabling team members to critically engage with SHC concepts and methodologies. Consequently, CED-AACF staff participated in live and online meetings with researchers, creating a collaborative environment that offered practical insights for their daily work.

Furthermore, the participation of the professionals involved in the project, particularly the two previously mentioned teachers of LGP Language, introduced a novel pedagogical approach tailored to the needs of Deafblind young individuals. This training challenged educators already skilled in implementing SHC, promoting a more effective learning environment. After the project, these LGP teachers took on the responsibility of observing haptic communication, documenting new signs, and sharing them within the socio-educational community.

Another important outcome of this project is the creation of an opportunity for self-representation for Deafblind young people through a globally disseminated website. This initiative has empowered them to express their identities, contributing to a sense of agency within a broader community. By showcasing Deafblind individuals, this website is an example of a positive practice, thus fostering understanding and awareness about Deafblind lives and challenges.

The involvement of families of Deafblind youth from the project's start has been crucial. By sharing their communication strategies and celebrating successes with the educational community, families have expressed pride in the publicly available outcomes. This collaboration highlights the essential role of family engagement in educational and communicative processes.

Another impact was created through the implementation of Multiplier Events (ME), which are dissemination and exploitation sessions with diverse publics to present and promote the project's results. These ME allowed the Portuguese team to reach:

a. one higher education institution (University of Porto) with research groups in Deaf Studies, reaching 7 international researchers.
b. one higher education institution (School of Education of the Polytechnic Institute of Setúbal) with courses in the areas of LGP Translation and Interpretation, with an audience composed of 42 people, among which higher education teachers, sign language interpreters, and Deaf and hearing students, which consist on one of the project's main target public: future professionals in the area of sign language translation that will work with Deaf and Deafblind population and that can integrate the projects materials in their professional activity;
c. one educational and social institution for deafblind people, CED-AACF, our partner in this project, where we provided feedback to the technical and educational team that had members directly involved in the research process. We presented the outputs to 20 participants, including Deaf LGP teachers, a pedagogical coordinator, teachers, educational

technicians, a psychologist, a Deafblind adult, and other staff. Besides feedback, this ME was also a way to publicly recognize the work done by those who were heavily involved. This recognition was immediate from the project team, peers, and management of the organization.

The MEs not only opened the project's doors to the community, showing the tools and materials that would become available to use in a free and open access modality through the project website (Portuguese page: `https://www.spreadthesign.com/pt.pt/social_haptic/`), but also served as a way to collect valuable feedback and input from different sectors of academic, educational and training settings.

Lastly, the project has facilitated the development of a database of haptic signs, contributing to the documentation of this unique form of communication as result of an international effort. While it is essential to note that this effort does not imply standardization within the Deafblind community, the creation of such a database represents a valuable resource. It provides a foundation for future research and practice, promoting greater awareness and understanding of haptic communication methods among professionals and the community. This initiative highlights the potential for ongoing exploration and adaptation of communication practices that honor the diverse needs of Deafblind individuals.

6 A Letter to the Future: Portuguese Protactile

Having presented our project on social-haptic signs, we would like to address the future of the Deafblind in our country. During our meetings, the team embarked on discussions concerning the developments needed for the Deafblind in Portugal. Recent research led us to discuss the emergence of the Protactile language, which is now a focus in the field of sign language linguistics.

The pro-tactile social movement started in Seattle in 2007, under the premise "that all human activity can be realized via touch – that hearing and vision are not necessary for co-presence, navigation, interaction, or communication" (Edwards 2014b; 2018). After that, many started to acknowledge that the language, called Protactile, that the American Deafblind community was using, more specifically in Seattle and in Washington, D.C., is a full-fledged language. Protactile surely stems from American Sign Language, but it is now an autonomous linguistic system that emerged from the interactions of Deafblind people. Recent linguistics research shows that Protactile has distinct morphology and syntax from Visual American Sign Language. Terra Edwards wrote about the transition process from a

spatial to a tactile language and called it re-channeling. We believe that this re-channeling also happens from sign language to haptic signs, and they are preceding the possible emergence of Portuguese Protactile.

We can affirm that for most Deafblind people in Portugal, LGP is rarely a viable means of communication. This is largely because Deafblind individuals are often placed in institutions that are neither prepared nor adequately trained to support their needs. Furthermore, deafblindness is frequently misconstrued as merely another form of multiple disability, resulting in many Deafblind people being isolated in environments where staff possesses little or no knowledge of LGP, including its visual, tactile, or hand-supported forms.

LGP has been the language of choice for years by several Deafblind people in our country without relevant linguistic adaptations, since we sign on each other's hands (hand-supported LGP). Therefore, any LGP signer can fully understand interactions between Deafblind people in LGP. What Edwards (2014a) unveils as the "redistribution of sub-lexical complexity in a tactile field" elements such as the migration of spatial elements to the body, using the body of the interlocutor/addressee's body as a linguistic space, three person configurations, and matured proprioception linguistic dynamics and tactile habitus are processes that are yet to happen in our country and with LGP. The primary obstacle to this, which can also be framed as a human rights concern, is the absence of a cohesive Deafblind community in Portugal, along with the social and cultural dimensions that a community typically encompasses. This remains so because Deafblind people are subjected to invisibility in social, educational, and cultural contexts. This invisibility is fuelled by the concept of multi disability (*multideficiência*), although research has pointed out that these frameworks do not serve the best interests of Deafblind people (McInnes, Treffry 1982).

Now and then, a Deafblind person gains social visibility, usually in Deaf community contexts, academia, or in media articles with ableist contours that regard Deafblind people's achievements regardless of sensorial impairments, instead of looking at societal limitations to include and give equal opportunities to Deafblind people. So, the Portugal Deafblind network and the Deafblind community *per se* are yet to emerge.

We believe that haptic signs collected in this project in Portugal may be the very genesis of a possible future for the Portuguese Protactile, since the proprioceptive sense is widened with haptic signs and the project itself allowed Deafblind people to gather and have conversational moments (although insufficient, and this is still a goal of ours), thus allowing for linguistic experimentation, not only among Deafblind people but also with Deafblind interpreting teams. It has become clear that gathering Portuguese Deafblind

people and allowing them to meet and communicate will provide the atmosphere for the emergence of more haptic signs, and one day, a future Protactile language, but no less important, a Portuguese Deafblind community.

7 Conclusion

Social-haptic communication is a tactile-based communication modality for Deafblind and Deaf individuals with low vision, yet it remains underutilized in Portugal due to geographic dispersion, lack of specialized training, and insufficient demographic data on the Deafblind community. This paper reflects on the Portuguese team's involvement in the international project *Social Haptic Signs for the Deaf and Blind in Education*, focusing on the process of documentation and production of 24 haptic signs integrated into a national collection of 80 signs.

Within the Portuguese context, the project fostered strong collaboration between academic researchers, educators, Deafblind individuals, and professionals, resulting in the collection and documentation of 24 haptices. Filming sessions ensured Deafblind representation, enhancing the legitimacy and quality of the materials produced. The project promoted reflection and learning among professionals working with Deafblind people, introduced innovative pedagogical practices, and empowered Deafblind individuals through self-representation. Multiplier events allowed dissemination to academic, educational, and social sectors, expanding the reach of project materials. Overall, the initiative established a valuable database of haptic signs that supports future research and education.

The haptic signs documented through this project represent an important stepping stone. We hope these resources serve as more than practical tools, as they lay the groundwork for both linguistic innovation and community formation. By expanding proprioceptive communication and facilitating interactions among Deafblind people and interpreting teams, and educators, the project not only fosters language experimentation but also launches the emergence of a cohesive Deafblind community in Portugal in the future.

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Part 2
Social-Haptic Communication
in Deafblind Interpreting Services

Haptic Signals as Part of Interpreter Services for Deafblind People
Historical and Developmental Perspectives from a Norwegian Context

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Abstract Interpreter services for deafblind people are relatively new services, and the profession of being an interpreter for deafblind people is understood and organized in various ways in different countries. The area of communication adjusted to deafblind people's tactile modality remains an area under international development. This article investigates the development of deafblind persons interpreter services from a Norwegian perspective, with a specific focus on the techniques developed to convey information on the environment to deafblind participants through haptic communication.

Keywords Deafblindness. Tactile modality. Haptic communication. Interpreting services. Haptic signals. Deafblind history.

Summary 1 Introduction. – 2 A Nordic Focus on Deafblindness. – 2.1 Agreement on a Nordic Definition of Deafblindness. – 2.2 Awareness of Varying Communication Methods. – 2.3 Specific Services are Needed. – 3 Background and Context. – 4 Evolution of Communication in Tactile Modality. – 5 The Development of Haptic Communication. – 6 International Reports and Status. – 7 Documenting Evolution in the Use of Haptic Signals in Norway. – 7.1 Improvement in Services and Knowledge. – 7.2 Identity, Awareness, and Empowerment. – 7.3 A Combined Process – Clear Improvements and Starting from Basics. – 8 Conclusions.

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1 Introduction

Using Norwegian data, the aim of this article is to present the ongoing developments of communication practices in the provision of interpreter services for the deafblind population and for society. Part of this development has been a raising awareness of the tactile modality of communication, where the use of varies tactile signals is a growing area of interest and use. As part of the interpreter services, these relatively new signals have contributed to the increased quality of environmental description in an effective and simultaneous form – adjusted to empower a tactile orientation toward interaction and communication.

Different options in terminology are in for use for such signals where the body of the deafblind person functions as an articulation place for physical information signals – as for instance 'social-haptic communication' and 'haptic communication'. In this paper, we adopt the term 'haptic communication' and 'haptic signals' for such signals and communication forms. The impact of the haptic communication in deafblind society will be of specific focus in this paper, where the discussion will try to answer the research question: How have haptic signals become a part of interpreter services for deafblind people?

2 A Nordic Focus on Deafblindness

Within the Nordic countries, there is a collaboration on issues regarding social welfare. Because deafblind people are only found in small numbers in every Scandinavian country, the Nordic Council of Ministers established a study to report on their status (Petrén 1980). An important point in this report was the agreement that the combination of deafness and blindness functions as a separate and unique disability, namely deafblindness. The Nordic report on issues related to the deafblind population (Petrén 1980) concluded on three needed actions, all relevant as a background for this current study's research question:

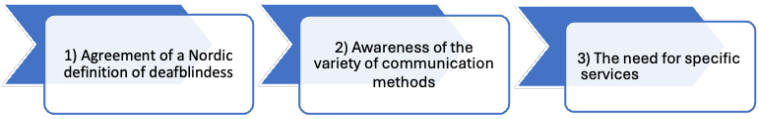

Figure 1 Three of the conclusions from Petrén 1980

2.1 Agreement on a Nordic Definition of Deafblindness

In the description of the deafblind population, the Nordic Report provided a Nordic definition of deafblindness, identifying the group to be those totally deaf and blind, those having residual hearing and residual vision, those born with deafblindness, and those acquiring deafblindness after the age of learning a language (Petrén 1980). Based on the individuals' level of function living with this combination of impairments, deafblindness was proposed to be a specific disability. The Nordic agreement on the definition of deafblindness was formulated as follows (English translation from Göransson 2008, 22-3):

> A person is deafblind when he or she has a severe degree of combined visual and auditory impairment. Some deafblind people are totally deaf and blind, while others have residual hearing and residual vision. The combination of impairments mutually reduces the prospect of using the potential residual vision or hearing. This means that people with deafblindness cannot automatically utilize services for people with visual impairments or with hearing impairments. Thus deafblindness entails extreme difficulties with regard to schooling, further education, working life, family and social life, cultural activities, and information. For those who are born deafblind or acquire deafblindness at an early age, the situation is complicated by the fact that they have additional problems affecting their personality or behavior. Such complications further reduce their chances of using any residual vision or hearing and also make the development of other functions more difficult. Deafblindness must therefore be regarded as a separate disability which requires special methods for communication and special methods for coping with the functions of everyday life. (Petrén 1980, 78-9)

This definition of deafblindness points to a highly heterogeneous group in terms of age, living conditions, and educational and communicative background. This definition was quickly put to use and had an impact on introducing the need for further work to be done at the Nordic level as well as internationally. For a more updated version of the definition, see the Nordic Leadership Forum on Deafblindness (2024). This functional definition states that dual sensory loss affects functions in daily life in several critical areas. The effect of dual sensory loss is so severe that in 1980, the following formulation was used for the deafblind population: "deafblindness entails extreme difficulties with regard to schooling, further education, working life, family and social life, cultural activities, and information" (see above quotation from Göransson 2008, 22-3). With this background, the Nordic countries started to improve and establish services for their deafblind populations.

2.2 Awareness of Varying Communication Methods

The Nordic report from 1980 was precise when it came to describing the diversity within the groups of deafblind persons. There were various communication methods and modalities among those born deafblind and those having first acquired a language (visual/manual or oral/spoken) before becoming deafblind. Several communication techniques were in use but were not quantified in the report. However, as part of the first Norwegian national survey, the communication methods used between the interviewer and identified deafblind persons were considered categories for these communication methods for the total diagnosed population (Sosialdepartementet 1977, 45-6):

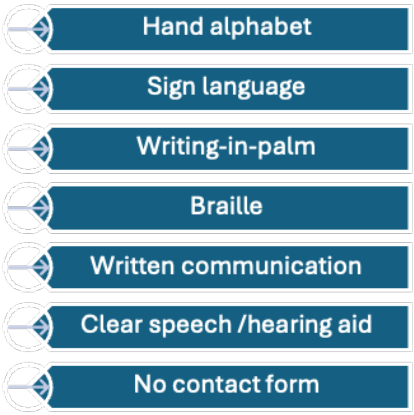

Figure 2 The diversity of communication techniques and modalities (elaborated by the Author)

Many of the deafblind persons had very few people in their surroundings they were able to communicate with. Isolation was a frequent theme when describing the individual person's life. Among the group of deafblind persons, many found it hard to understand other deafblind persons who used another way of communication than their own. This meant that when reaching out in society, but also within the group of deafblind persons, there were severe challenges in interaction and a lack of belonging to a community where one is easily understood. The general awareness of communication with deafblind persons was an area that society had little information on in the early 1980s. Techniques of what today is named haptic signals or haptic communication are not listed in figure 3, since such methods were not developed and taken in use back then.

2.3 Specific Services are Needed

The Nordic survey pointed toward several needed services, among them the need for interpreter services (Petrén 1980). The need for guiding and interpreting service had also been commented among deafblind persons from the first Norwegian national survey from 1977 (Sosialdepartementet 1977). In the recommendations, it was suggested to develop a combined guide and interpreter services. In a follow up Nordic report, the elements of such a service and a future draft for a Nordic curriculum for education of interpreters for the deafblind population were made (Hansen 1984). It took some years to get national education programs running to train interpreters. The process was supported by the United Nations' focus on disability and human rights, which led the process of expanding the regulation of social welfare to include deafblind persons' right to have interpreters working in health care, the educational system, and in cultural and daily living events.

3 Background and Context

In the Scandinavian countries, the work to improve the situation for deafblind individuals has a clear starting point. In the late 1970s, the Norwegian official health authorities took action to learn more about the status of the deaf and blind population. There existed little information on this group, and there was a need to learn more on basic questions such as: Where do we find those in our society who are deafblind or who have a severe combined loss of sight and hearing? How many individuals are deafblind? To what degree are they occupied and take part in society? How do they communicate? What are their needs for services? Investigations were needed to bring more knowledge on the group and to discuss the needs among individuals and the population having dual sensory loss (Sosialdepartementet 1977). Important questions were raised, and challenges were identified by this first national survey led by the health authorities in the years 1976 and 1977, and this led to more systematic work in this field (Sosialdepartementet 1977). Among the population of about 5 million Norwegian inhabitants at the time, a total of 202 persons were diagnosed with deafblindness (Sosialdepartementet 1977). The group was heterogeneous when it came to background and preferred communication methods, the average age was high, few were engaged in paid work, many did not make use of society's general offerings, and most had reduced or no access to ordinary public services. The survey concluded that there was little knowledge about the group and that actions were needed.

From 1980 to 1990, the United Nations encouraged the implementation of services and regulations aiming at reaching more equality for all populations, including those with disabilities.

During this period, in Norway the local authorities financed support services for deafblind people. This was an important step towards more inclusive positions in the deafblind person's daily life, neighborhood, and community.

The right to interpreters was incorporated into the Norwegian national insurance law of 1986, and the service had to be provided by certified professionals in interpretation and guiding and had to be free of charge. From the beginning, the regulations were limited to a specific number of hours per year financed by the government. Strong lobbying work from the deafblind associations, among others, changed this from 200 hours a year for each deafblind person to 500 hours, to today's regulation providing free use of the service based on the individual's needs (Lov om folketrygd 2023). From the beginning of the 1990s onwards, there was development from a voluntary working profession to a professional interpreter and guide service (Raanes, Berge 2017).

In 1993, the Nordic Council of Ministers' administration for disability performed a follow-up study on the status of deafblind people. One of their main points was the need for increased cooperation between associations for deafblind people, the parents' organization for deafblind children, and the public services with the aim to improve the living conditions for the deafblind population. Access to information was another critical point, and this included access to information via interpreters as well as supporting deafblind persons' ability to get access to information sources and to avoid isolation (Nordiska Nämndenför handikappfrågor 1993, 75; SOU 1991).

A Nordic training center for staff working with deafblind children and adults was established (NUD). NUD ran courses and intensively published materials to inform the professionals and the public. Development in the field and staff training were supported by Nordic resources and studies, and national education programs for deafblind children and rehabilitation centers for those with deafblindness were established in Norway starting in the 1980s.

The Norwegian Association for the Deafblind (FNDB) had for many years worked to establish needed services for deafblind people to be able to take part in society, and the national survey on deafblindness from 1977 had as one of the conclusions the need for guides and interpreters (Sosialdepartementet 1977, 45). The first interpreter training oriented toward the deafblind started in 1983 as short-term course run by the Department of Education. Admission to the course included an entrance examination in sign language and ended with a certification test in interpreting and guiding for deafblind persons. At the beginning, this training was only a 7-week education course,

but later the education model developed into a university program in 1990 – first as a 1-year full time program and then as a 3-year Bachelor program. In the curricula for the university education in sign language and interpreting, interpreting for deafblind clients was part of the program, including interpreting for the deaf and sign language as main subjects (Erlenkamp et al. 2011).

When the interpreter education was organized as ordinary programs of higher education, several structures around the curriculum had to be strengthened. The interpreter program went through an intensive process of improvement supported by the development of a theoretical foundation, especially theories for teaching subjects of tactile sign language, and a focus on using sign language grammar and interpreting skills in various arenas.[1] Teaching practical knowledge in the subject as well as developing research-based knowledge became areas of focus (Urdal 2017). As areas of specific knowledge, both national and international studies were included in the education as a basis for discussions and training.

During the early 2000s, the input from the deafblind community on the need for developing strategies for having access to one's environment through haptic signals was incorporated as a topic in the interpreting curriculum. This provided new awareness and knowledge on how interpreting and interaction could benefit from haptic information.

4 Evolution of Communication in Tactile Modality

The awareness and skills in communication methods in use among the deafblind community has seen ongoing developments within this community, and there has been increased knowledge among service providers, in academia, and institutions working on communication and other services needed by deafblind persons.

The first dissertation on tactile sign language was Mesch' study on tactile Swedish sign language from 1998, followed by studies of other national tactile sign languages (Mesch 1998; Mesch et al. 2015; Collins 2004; Raanes 2006), and interpreter-mediated communications have been studied using data regarding deafblind persons' communication methods (Berge, Raanes 2013; Gabarró-López, Mesch 2020; Raanes 2020a). There are still several aspects where more basic knowledge within communication and interaction in tactile sign language needs to be developed. New methodical resources – with corpus-based

1 See the *Bachelor Program in Sign Language Interpreter* of the Norwegian University of Science and Technology, Trondheim, at the link: `https://www.ntnu.edu/studies/ltbatgtolk`.

studies, cross-signing data, and studies on empirical data on communication and interpreter-mediated interaction – are areas that hopefully will contribute to useful developments in this field of linguistic and professional knowledge.

5 The Development of Haptic Communication

The awareness and regional development of haptic signals as part of the communication within the deafblind society were led by deafblind teachers and researchers. Some of this development is built on structures already used among deafblind persons. Tactile reception and tactile modality were in use by signing, fingerspelling, and a few response signals given on the person's hand or body. Standard response signals for 'yes' and 'no' – received as tapping and touched signals made on the deafblind person's hand – have a long tradition in communication for deafblind people and have been documented in Nordic journals for the deaf as far back as the nineteenth century (Keller 1864). From the early years of the twentieth century, this body-based channel of information signals started to be explored further in the Nordic countries as haptic signals.

These new haptic signals were spread by courses and through training. In Norway, the deafblind teacher Trine Næss led the development of haptic signals in a Norwegian context, and over several years she took part in national and Nordic courses involving deafblind persons, their family members, interpreters, and rehabilitation staff where haptic signals were trained to be included as part of everyday communication. Deafblind instructors were specifically trained and contributed to a raised awareness of communication and of deafblind people's participation. In all Nordic countries, the associations for the deafblind started working to spread information on the system of haptic signals. Associations for deafblind persons and by the Nordic staff education (NUD) contributed by producing instructional materials and papers on these developing techniques (Næss 2002; Lahtinen 2003; Nielsen 2012). The use of haptic information signals has become an international research area, with some variations of signs and terminology, including terms as social-haptic communication, haptic communication, or pro-tactile movement (Næss 2002; Lahtinen 2003; Edwards 2014; Bjørge, Rehder 2015).

Within rehabilitation, interpreter education, and interpreter services in Norway, there was an increased use of haptic signals in the deafblind community at the beginning of the 2000s. We can conclude that services and methods have spread and have gained ground over a relatively short period. As relatively easy signals to learn, many embraced the signals, and studies in Norway showed the signals

specifically useful for those having acquired deafblindness and who used the signals in combination with clear speech/reduced hearing. This is described in the studies by Skåren (2011) and Raanes (2020b), in which a range of everyday situations were regarded positively in terms of feeling empowered and in control in interactions when the interpreters added haptic signals into the interpreter-mediated communication. It took some more time before the signals were taken into use for the deafblind signing population (Raanes, Berge 2011).

6 International Reports and Status

In 2018, the World Federation of the Deafblind (WFDB) presented an initial global report on a population-based analysis of persons with deafblindness. The report showed that persons with deafblindness in general are a very diverse group that remain hidden in their societies and concluded with three areas in need of further work: 1) international acknowledgment and recognition of deafblindness as a unique and distinct disability, 2) publicly funded interpretation services providing interpreter-guides, and 3) funding for further research and strengthening needed support (WFDB 2018). These conclusions are in many ways parallel to the status presented in the Nordic report by the Council of Ministers in 1980.

The second global report by the WFDB, *Good Practices and Recommendations for the Inclusion of Persons with Deafblindness*, showed some positive developments in terms of awareness and services for the deafblind (WFDB 2023a). In 2023, a report with a specific focus on the oldest part of the population was also published (WFDB 2023b). The WFDB now identifies a new subgroup "Those who were both sighted and hearing until they started losing both senses due to ageing" – to be the largest group among the deafblind population (WFDB 2023c, 3). As deafblindness becomes more common as people age, this subgroup has challenges described as follows:

> its members are usually unfamiliar with the experience of being Deafblind and with alternative means of communication, and therefore experience more difficulties to communicate, read, access information, and move independently. (WFDB 2023c, 3)

The report concludes that the elderly deafblind population "is the least equipped to bridge the communication gap that is opening between them and their surroundings" (WFDB 2023c, 3). Internationally, there are few actions to improve the elderly part of the deafblind population's living conditions, and this is also true for the Nordic countries.

The report from the WFDB (2023a) also pointed to the ways in which awareness and empowerment of the groups of deafblind persons have improved over the last decades. There have internationally been several parallel processes in terms of initiatives aiming to improve access to information and communication. In guidelines for communication with deafblind people, international resources and studies show a clear picture of how deafblind persons' tactile communication has developed. In a core publication from 2002, Theresa B. Smith described the ways the deafblind community in the United States communicates. Even though minimal response signals produced by tapping on the interlocuter's body are described as being part of the communicative repertoire, the concept of what today are called haptic signals or pro-tactile communication was still not part of the described communication (Smith 2002, 99).

Digital tools as well as the emerging techniques of haptic communication have influenced the field. As part of an ongoing European development project, Laura Volpato has introduced haptic communication among Italian deafblind persons, their caregivers, and staff and has helped spread and develop the system. The signals are modified and adjusted to the national group's communication (Volpato 2023). In Willoughby et al.'s (2018) study, an overview of the status of tactile signing language is provided. Studies and services can thus be seen as an ongoing development and awareness of the group, their needed services, and their communication systems.

7 Documenting Evolution in the Use of Haptic Signals in Norway

During the last decades, deafblind communication has undergone an evolution where a tactile orientation towards interaction has been strengthened and the use of haptic signals has become a natural part of the communication repertoire. From the beginning, such haptic signals were seen to be useful, but there were also those among the sign language-speaking deafblind population having a different opinion. During my own studies, and by working within this field over time, I have witnessed the introduction of haptic signals for the deafblind community. During my own PhD work, I gathered groups of tactile signers in 2000 and 2002 (Raanes 2006). In the video-recorded data of deafblind persons communicating, there were in general no observations of other haptic signals than the conventional response signals by light tapping or stroking signals for 'yes' and 'no'. As said above, those tapping signals have a long tradition in deafblind person's communication (Keller 1864). For my PhD studies, I also interviewed tactile signers who commented on how they felt a possible disturbance in their conversation by being touched on the

body. They expressed that such signals would prompt them to turn or to let go of ongoing conversations to concentrate on something else going on. Among the primarily signing deafblind informants, they were not sure of this as a method for themselves to use or signals they needed. However, they reported that they were open to the situation where deafblind persons could use hearing aids as a communication method and where such new haptic bodily signals could orient the person on what was happening in their surroundings.

In 2007, I worked in collaboration with my colleague Sigrid Berge on a new project in which deafblind persons were involved in the collection of empirical data from a meeting of an association for deafblind persons. In videotaped conversations and interviews, it was seen that the deafblind persons and their interpreters took into use various bodily haptic information signals. Compared to what was seen in datasets from the very early years of the 2000s, there had been a change toward haptic signals becoming part of the communication. In interviews with the deafblind informants, they commented as follows: "for me it is the best system ever invented" or "yes in some situations these signals are useful for me". The attitude had turned, and there had been a movement from skepticism to acceptance (Berge, Raanes 2013).

Material for haptic communication was incorporated in the education programs for interpreters and in rehabilitation programs for persons with deafblindness and blindness from the early years of the twentieth century. The research found positive attitudes as to the usefulness of haptic signals for deafblind as well as blind participants. The first studies regarding experiences with haptic communication indicated a strengthened feeling of access among those taking part in the situations (Lahtinen, Lahtinen, Palmer 2010; Skåren 2011; Berge 2020; Raanes, Berge 2021).

The process leading to this change is based on multiple factors which will be discussed in the following three subsections: improvement in services and knowledge (§ 7.1), identity, awareness, and empowerment (§ 7.2), and progress and continuing work (§ 7.3).

7.1 Improvement in Services and Knowledge

This review has documented an ongoing development, where there have been emerging services and aids assisting persons with deafblindness (Sosialdepartementet 1977; Petrén 1980; SOU 1991). Interpreting has become an important service and is central to opening social services for the deafblind population. To have qualified interpreters suitable for the deafblind population's needs is a continuing process. Legal regulations and the establishment of interpreter services have been important parts in the process of

improving deafblind persons' participation in society. Official work on the government level supported by an international focus of disability groups through the United Nations has put a focus on deafblindness and made changes possible for the population of deafblind people. Interpreter mediation in rehabilitation and education has been crucial in the process of opening the society and improving living conditions for deafblind persons. The services of interpreting have undergone many improvements in the last few decades, and the professionalization of the field has increased.

The establishment of interpreter services and regional organizations were important to meeting the needs for deafblind people to be active in family life, work, cultural participation, and society. Access to information has been developed through new services and improved technical and digital aids. The change in the definition of deafblindness has removed the formulations of "extreme difficulties" and replaced this with an understanding of how deafblindness is not incompatible with being able to contribute to society. The consequences of deafblindness requires rehabilitation, aids, and specific services adjusted to deafblind people's needs (Gullacksen et al. 2011). The data from these studies in Norway show that during the past few decades, there have been dramatic improvements in several areas.

The introduction of haptic signals has been emphasized in this review, where representatives of deafblind professionals and organizations for the deafblind have made important contributions. Haptic signals are today a part of the communication repertoire and are useful for deafblind persons and for society in general. Knowledge on communication through the tactile modality has contributed to a better understanding of tactile interactions and tactile orientation and has extended our understanding of human experiences and communication.

Dual sensory loss raises many practical and mental barriers to accessing activities. The lack of rehabilitation programs toward the oldest part of the population may mean that the services do not reach all those with deafblindness. The WFDB (2023b) states that among the oldest part of the population, there are important actions needed to improve access to services, society, and interactions. This is also relevant in the Nordic context.

7.2 Identity, Awareness, and Empowerment

Communication and identity are linked together, and to be understood and have access to information and participation is critical for all. Increased awareness of the deafblind population and improved interpreter services have strengthened the deafblind community and their access to society. The right to access to interpreters and the establishment of educational programs for interpreters have been important in the development of a more accessible society for deafblind persons. The development of haptic signals has supported the understanding of a tactile orientation and awareness. In addition to providing information, haptic signals may also emphasize the need for taking time to integrate the deafblind persons into the ongoing activity. Provision of haptic information and orientation may be understood as a way to empower deafblind persons' feelings of access in interaction and to enable their participation in social activities. A similar development has been seen internationally, labeled with terms such as 'social-haptic communication' (Lahtinen 2003), 'haptic signals' (Næss 2002), and 'pro-tactile movement' (Edwards 2014), all of which have in common an emerging understanding of the tactile modality in communicative actions.

From the early work of Riitta Lahtinen and Trine Næss, the haptic approaches have become well known and are still being developed for further use by children and for adults involved in a range of specific areas and purposes. An example of this was seen at the first international conference on haptic communication – Hapticconf 2023 – arranged in Italy by Ca' Foscari University of Venice in 2023. Here several new approaches were presented, as was the presentation on the use of haptic signals for those training to work together with guide dogs (Timm 2023 and the article by Cathrine Timm Sundin and Nina Frisnes Øyan in this volume). Haptic signals are thus being adopted and adjusted toward various areas, needs, and personal preferences.

7.3 A Combined Process – Clear Improvements and Starting from Basics

There are several aspects on how to answer the research question on how haptic signals have become a part of the interpretation services. The services and knowledge around deafblindness can be described as a field with steady and clear improvements. Within the established services and among those deafblind persons actively working at participating in society and social life, there has been progress in knowledge and offerings. Interpreting services and general knowledge among care givers, families, and deafblind persons in

terms of tactile communication, rehabilitation, and haptic signals makes these people's lives easier. Thus, recent developments might be presented as a rising linear improvement with a growth in knowledge and in the number of services for the population of deafblind people. As part of these improvements, there has been increased identity, awareness, and empowerment among its members.

Not all those who are deafblind are included in this development, however. While there has been positive development among the population of deafblind, there are still groups facing the risk of being excluded in interactions and who live under conditions as described in the first Nordic definition on deafblindness, namely under extreme difficulties. Undiagnosed elderly persons with combined sensory deprivation, children with specific special needs, and persons with the use of alternative and argumentative communication are among groups where a tactile approach to communication and interaction may be useful and may extend the available inputs of communications patterns.

Due to the average high age in the group of deafblind, many are often not mentally capable of arguing for the many services and aids they need. The new persons joining the population of the deafblind are usually elderly people, as described in the WFDB report from 2023. Those becoming deafblind may take a long time to be introduced and motivated to undergo rehabilitation and to start the process of learning new skills. The new orientation process may be complicated and involves the deafblind person, family, caregivers, and professional service providers in the person's local community. Because these people belong to a rare group, it may take time to establish the needed knowledge and information to learn to use adaptive services and aids. Both in Norwegian as well as in international data, those becoming deafblind in the elderly part of the population are at risk of not getting the needed attention and help they need, thus resulting in challenges for both the deafblind person and those around them.

In parallel with this process of improvement, the perspectives may also be described as a circular orientation toward those experiencing becoming deafblind and those around them who are being introduced and recruited into the field of deafblindness. For many, the starting point of understanding the challenges and issues concerning this field is of little knowledge and awareness. Within different groups of the deafblind population, the process will have to be starting from a very basic level – again and again.

8 Conclusions

In this study, I have investigated how haptic signals have become a part of interpreter services for deafblind people. In the Norwegian context, I have documented the process of how interpreting services have developed and the way haptic communication has been spread in society. Important parts of this process have been legal regulations regarding the right to interpreter service and governmental funding of education programs for interpreters. These services have strengthened deafblind persons individually and as a group.

The ongoing development and awareness of the deafblind population, the services they need, and their communication methods are documented here based on Norwegian data. The WFDB suggests in their report from 2023 that there should be a new definition of how deafblindness is understood, which is related to the prevalence of dual sensory impairment (hearing and vision loss) that increases substantially with age and influences the services that need to be developed. On-demand interpreter services are important services to give access to information, participation, and rehabilitation for deafblind persons. The development of haptic signals as a new method might be introduced and spread among deafblind people in a wide area with the potential to strengthen interaction processes. This study shows the need for continuing work to include deafblind persons and to improve their access to services and participation in social life and social activities.

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Social-Haptic Communication in Brazil and Its Developments
Paths and Possibilities

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Abstract Social-haptic communication (SHC) is a kinaesthetic language structured through touch on the body of a person who is deafblind. It extends beyond conventional visual and tactile modes of alternative communication, enabling linguistic organisation through grammatical rules. This article presents and discusses the main findings of the first author's doctoral research, focusing on the training of guide-interpreters and the structuring of SHC in its consolidation as a natural language. In addition, it examines the role of narrative in constructing knowledge about and within SHC. This qualitative, narrative-based study draws upon the accounts of deafblind individuals and guide-interpreters who participated in a training course conducted by the first author. Their experiences served as the foundation for data collection and analysis.

Keywords Deafblindness. Social-haptic communication. Guide-interpreter. Libras. Narrative. Training.

Summary 1 Introduction. – 2 Characteristics of the Person with Deafblindness. – 3 The Research Project. – 3.1 Methodological Approach. – 3.2 Participants. – 3.3 Ethical Considerations. – 3.4 Data Analysis. – 3.5 Narratives of People with Deafblindness. – 3.6 Communication Modalities with Persons with Deafblindness. – 3.7 Social-Haptic Communication in the Lives of People with Deafblindness. – 4 Linguistic Aspects of Social-Haptic Communication in Relation to Languages of Different Modalities. – 5 Conclusion and Implications for Practice and Research.

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1 Introduction

This article derives from the doctoral thesis of the first author (Vilela 2022), which was developed within the framework of narrative research as proposed by Clandinin and Connelly (2004). The essence of this methodological approach lies in recounting the experiences of both the researcher and the participants. In this case, the participants were professional guide-interpreters of Brazilian Sign Language (Libras) and individuals with deafblindness. The encounter between these participants and their unique modes of communication is narrated through stories that reveal how relationships are formed via touch-based interactions and bodily connection.

Under the supervision of Professor Dr. Adriana Barroso de Azevedo, we constructed a trajectory of discoveries through the dialogues developed over six years of research on deafblindness. This article presents the main developments arising from that doctoral research, which focused on the training of professional translators and guide-interpreters of Libras in the use of social-haptic communication (SHC). It also explores the linguistic construction of SHC, comparing it with both the Portuguese language and Libras, as used by the authors.

The study further benefits from the contributions of professor, translator, interpreter, and guide-interpreter Stephanie Caroline Alves Vasconcelos, who played an integral role in the development of the doctoral project and in the work of the Group for Studies and Research on Inclusion and Social-Haptic Communication (GEPICSH), established in 2021. This interinstitutional and transdisciplinary group comprises researchers and professionals from various educational institutions and diverse fields of knowledge and practice, including the participation of Professor Dr. Riitta Lahtinen and Dr. Russ Palmer, pioneers in SHC. As a research collective, we have focused on the linguistic possibilities of SHC and their broader implications.

The data presented in this article are drawn from a training course in SHC, conducted by the first author, with the participation of deafblind individuals and guide-interpreters. People with deafblindness are those who experience combined hearing and vision loss, either from birth or acquired throughout life, and who primarily rely on the haptic channel – that is, the skin – for interaction and communication. Guide-interpreters act as communication mediators in contexts where deafblind individuals engage with others who do not use haptic-based communication.

This paper also offers a brief overview of the communication forms employed by deafblind individuals and professional guide-interpreters, including SHC, which has expanded and evolved internationally over the years. SHC has developed within deafblind communities to the

point of exhibiting structural features akin to natural languages, enabling grammatical and systematic organisation.

Drawing from the narrative experiences of guide-interpreters and deafblind individuals, the research underscores the need for further investigation to support the recognition of SHC as a natural language. Such recognition would have significant implications for professional training, accessibility development, and the promotion of inclusive practices. The researchers' ethically grounded approach, based on active listening and lived experience, contributes to advancing the field of deafblindness studies, which remains underexplored in Brazilian academic literature, and to promoting inclusion, autonomy, and quality of life for people with deafblindness.

2 Characteristics of the Person with Deafblindness

There are numerous definitions intertwined with the term deafblindness. In Brazil, deafblindness is still rarely mentioned within the broader landscape of disabilities and disorders, which have increased exponentially in recent years. Deafblindness is characterised by the simultaneous partial or total absence of the auditory and visual senses.

Some people argue that, due to this combination, deafblindness should be considered a multiple disability, while others maintain that it represents two distinct impairments. However, the definition of deafblindness as a unique condition serves to strengthen the identity of the deafblind person, acknowledging their specific characteristics and needs. The Brazil Support Group for the Deafblind and Multiple Sensory Disabled (2003, 1) defines deafblindness as follows:[1]

> a singular disability that presents hearing and visual losses concomitantly to different degrees, leading the deafblind person to develop different forms of communication to understand and interact with people and the environment, providing them with access to information, a quality social life, guidance, mobility, education and work.

This definition highlights the diversity of experiences among deafblind individuals, who must often develop personalised communication systems to achieve social participation and autonomy.

1 We are quoting from the Information Leaflet on Deafblindness issued in 2003 by the Brazil Support Group for the Deafblind and Multiple Sensory Disabled, a philanthropic organization in São Paulo.

A complementary definition is provided by the Helen Keller World Conference (2022) – named after Helen Keller, a person with deafblindness whose legacy continues to shape understanding of the condition. The Conference's statement emphasises that deafblindness does not apply only to those with total loss of both senses, but also to individuals with partial visual and auditory impairment, who encounter daily difficulties in communication and mobility:

> A person is [deafblind] when they have a degree of severe visual and hearing impairment that causes them serious problems with communication and mobility. A [deafblind] person needs specific help to overcome these difficulties in daily life and in educational, professional and community activities. This group includes not only people who have total loss of these senses, but also those who have visual and/or auditory loss, which should be stimulated so that their 'disability' is as small as possible. (HKWC 2022, n.p.)

Keller advocated the idea that people with deafblindness should be encouraged to pursue autonomy and develop their cognitive, sensory, and motor abilities, affirming their potential for learning and social contribution.

It is also important to consider the manner in which deafblindness is acquired, that is, whether the person has congenital or acquired deafblindness (Heller et al. 1994). Another crucial factor concerns the timing of language acquisition – whether it preceded or followed the onset of deafblindness. This directly influences the communication modalities adopted by deafblind individuals (see § 3.3), such as Libras, tactile signing, Braille, or social-haptic communication.

3 The Research Project

We understand research as a thread that weaves human experience through the relationships established among subjects who seek to engage in deep reflection on a given theme (Souza 2022). We live as we narrate, and we narrate as we perceive the experiences that have shaped our existence.

In the development of the first author's doctoral thesis, it is proposed that narratives and training are interwoven in shaping the experiences of people with deafblindness and translators/guide-interpreters of Libras. In light of this, the research problem was guided by the following question: What perceptions emerge among guide-interpreters of Libras when they employ SHC with deafblind individuals?

These experiences were observed, and the narratives were shared through multimodal texts, in which hyperlinks direct readers

to hypertexts presented in the form of scenes. Drawing upon the discussions developed within the thesis, this article seeks to examine the use of SHC in the training of guide-interpreters and to consider the role of narrative in the construction of knowledge about SHC.

3.1 Methodological Approach

The research adopted a qualitative (Gil 2002), narrative-based methodology, grounded in the work of Clandinin and Connelly (2004, 45), which values lived experience as a source of knowledge, as the authors explain:

> People shape their daily lives by stories of who they and others are and as they interpret their past in terms of these stories. Story, in the current idiom, is a portal through which a person enters the world and by which their experience of the world is interpreted and made personally meaningful. Narrative inquiry, the study of experience as story, then is first and foremost a way of thinking about experience.

This approach allowed the researcher to engage closely with participants' stories, interpreting meaning through interaction rather than through objective detachment. The methodology also emphasised ethical commitment, reflexivity, and the co-construction of knowledge between researcher and participants.

The research centres on the importance of training professional guide-interpreters, with the experience forming the basis of the study in question:

> For social scientists, and consequently for us, experience is a keyword. Education and studies in Education are forms of experience. For us, narrative is the best way to represent and understand the experience. Experience is what we study, and we study experience in a narrative way because narrative thinking is a key form of experience and a key way of writing and thinking about it. It should be said that the narrative method is a part or aspect of the narrative phenomenon. Thus, we say that the narrative method is the phenomenon and also the method of the social sciences. (Clandinin, Connelly 2004)

In this research, the 'field' consisted of the training sessions, the interpersonal relationships formed during these sessions, and the reflections and narratives emerging from these interactions. The data collection process involved field notes, recordings, interviews, and written narratives from participants. These materials were

subsequently organised and analysed thematically, guided by the principles of narrative analysis (Riessman 2002), which recognises that narratives are not merely reflections of experience, but constructions that give form and meaning to it.

Through this process, we engaged in iterative reflection, noting how participants articulated experience, adapted communicative strategies, and negotiated meaning across multiple modalities.

3.2 Participants

The participants comprised four professional guide-interpreters of Libras and three adults with deafblindness, who took part in the SHC training course. Each participant contributed unique experiences and communicative repertoires, resulting in a rich corpus of narratives.

The guide-interpreters were professionals accustomed to working with deaf people, yet with limited experience with deafblind individuals. Conversely, the participants with deafblindness already employed diverse communication strategies, including tactile signing, written Portuguese, and elements of SHC. The interaction between these groups offered insights into linguistic adaptation and multimodal expression.

The training course spanned eight months, 90 hours, consisting of weekly in-person sessions combining theoretical lectures, practical exercises, and group discussions. We facilitated the sessions while observing the participants' engagement, reflecting on how they internalised and adapted SHC strategies.

3.3 Ethical Considerations

The research adhered to the ethical principles established by Resolution no. 510/2016 of the National Health Council, which regulates research involving human participants in Brazil. All participants provided informed consent, with adaptations in accessible formats, such as tactile explanations, Braille, and enlarged print, to ensure comprehension and autonomy.

The project was approved by the Research Ethics Committee of the Methodist University of São Paulo, under Protocol no. 4.693.442. Ethical conduct in this study extended beyond formal approval, encompassing what Clandinin and Connelly (2004) refer to as "relational ethics", that is, ethics that emerge in the lived relationship between researcher and participants.

The narrative research design required the researcher to enter the participants' world through touch, dialogue, and shared physical space, which demanded a sensitive awareness of vulnerability,

agency, and mutual respect. This ethical engagement was crucial to building trust and authenticity within the narrative process.

3.4 Data Analysis

The narratives produced during the training were analysed through a thematic and interpretative lens, focusing on how meaning was constructed and shared through SHC. The analysis was guided by Clandinin and Connelly's (2004) three-dimensional narrative inquiry space – interaction, continuity, and situation – which allowed the identification of patterns and transformations across participants' stories.

As the authors explain, narrative as a research methodology in the field of education enables us to represent and understand lived experiences. Thus, in order to capture these experiences, we developed a course that considered the training dimension within the research-training framework, which involves the sharing of new knowledge and expertise. From this process, strategies were developed to enhance the professional practice of guide-interpreters.

From this perspective, the extension course "Continuing Training of Guide-Interpreters to Work with People with Deafblindness in Learning Social Haptic Communication" consisted of eight classes, during which the scenes were recorded and shared through a multimodal text approach. As Jewitt (2003) explains,

> multimodal approaches have proposed concepts, methods, and working perspectives for the collection and analysis of visual, auditory, embodied, and spatial aspects of interaction and environments, as well as the relationships between them. (Dionísio et al. 2014, 48)

The multimodal approach is characterised by the use of technological resources that enable the representation of meanings beyond the written text. In the video lessons, it is possible to observe participants' facial expressions, voice intonation, surrounding environments, and the sensations conveyed through these elements. Among people with deafblindness, we observed body posture and expressions that reveal feelings not expressed through words.

Excerpts from the classes are available via hyperlinks and by scanning a QR code with a mobile phone camera. The device identifies the code and directs the reader to the corresponding content, allowing access to a section of the course in which narrative and experience are shared. For example, Scene 5 presents an empathy activity designed to allow participants to place themselves in the 'position' of the deafblind. During a class break, participants were

blindfolded and asked to prepare breakfast. From this experience emerged the narrative of Scene 5, in which Ana Lis shares her perception of the activity and emphasises that everyone should have such an experience.

SCENE 5: ANA LIS' EXPERIENCE IN THE EMPATHY ACTIVITY AND IMAGE SHARED VIA WHATSAPP

Theme: Characteristics of the Person with Deafblindness

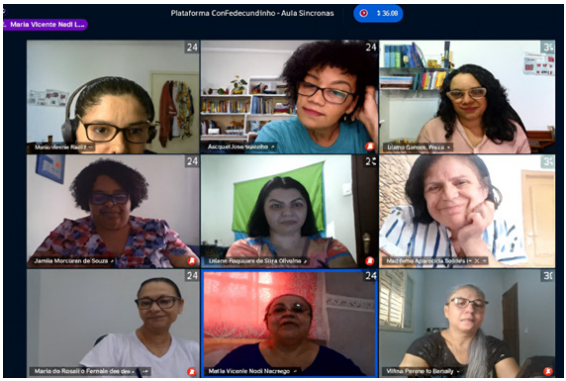
Ana Lis: "[…] We live in a two-storey house. As we had already had breakfast, I said, 'I'm going upstairs'. Cristina had already warned me that the bathroom was full of things, and I realised she was right, because I knocked everything over. As I walked, I dropped things from the table and even spilled some water. It was truly an experience – when you live it, you realise how difficult it is. I even shared a photo of this experience with Cristina in the group. She joked, thinking it was Acsa, but I said, 'No! It was me who was blindfolded!' She interpreted a song of praise, and I understood almost nothing. Tadoma is really difficult to follow – it's a challenging experience. But it's also a very meaningful one, because we can feel, at least a little, what a deafblind person experiences. I think it's an experience that everyone should go through."

Source: Vilela 2022, 63

In the first meeting of the extension course, the narratives were charged with emotion as each participant recalled the starting point of their journeys with inclusion, Libras, and their contact with deaf and deafblind individuals.

SCENE 1: FIRST MEETING OF THE EXTENSION COURSE

Theme: Attributes of the guide-interpreter's work



Source: Vilela 2022, 63

Many of the experiences shared by the participants were related to inclusion within the educational context, as all of them work or have worked as teachers or Libras interpreters for deaf or deafblind students.

3.5 Narratives of People with Deafblindness

In Scene 9, we present the narrated experience of Leandro, a participant with deafblindness, who recalls his story and the sensory loss of hearing and vision. He recounts his memories through Libras, interpreted into spoken Portuguese by his wife, Charlie:

SCENE 9: LEANDRO'S EXPERIENCE

Theme: Characteristics of the Person with Deafblindness

Leandro: "I was still a baby – when I was a few months old, I had very severe otitis and went to the hospital. Then I lost my hearing, but I could still see. […] As a teenager, I tried to use hearing aids, but I couldn't. At the age of fifteen, I began to feel pain in my ears and eyes; I experienced great anxiety, and my vision started to close in. I was isolated, living with my family on a farm. I lost my sight – I couldn't manage anymore: playing games, watching games, taking vitamins... One morning, I woke up, went to the bathroom, and looked in the mirror. I was startled – I realised I wasn't seeing anymore. […] I was twenty-two years old […]."

Source: Vilela 2022, 70

Leandro highlights the lack of communication within his family, as well as the isolation and sadness he felt: "I had my brothers, but no one communicated with me. I felt very isolated. People did not understand this new phase of my life, and communication was very difficult". The challenge of acquired deafblindness involves a complex process of adaptation – not only for the person who acquires the condition, but also for those around them.

3.6 Communication Modalities with Persons with Deafblindness

Guide-interpretation is not a simple activity, as it requires the guide-interpreter to learn the communication modalities used by deafblind individuals and to employ strategies that enable the transmission of information, including spatial and contextual cues. The guide-interpreter often translates spoken messages into tactile forms received through the hands of the person with deafblindness. This work demands dedication and embodiment: the interpreter communicates not only with their hands but with their whole body, sharing expressions, sensations, experiences, and knowledge that give meaning to interaction.

During the course "Continuing Training of Guide-Interpreters to Work with People with Deafblindness in Learning Social Haptic Communication", one of the classes – "Forms of Communication and Guide-Interpretation Strategies" – was designed according to the characteristics of the participants with deafblindness. All participants with deafblindness used Tactile Libras, and all students were familiar with and employed this modality in communication.

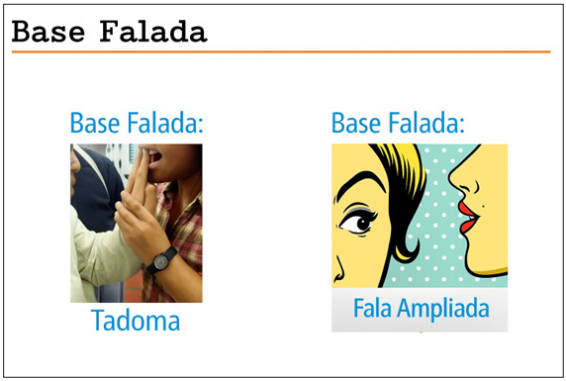
The course presented three main bases of communication with people with deafblindness:

i. communication based on spoken language;
ii. communication based on written language;
iii. communication based on Libras.

In the following scenes, images and definitions from classroom discussions are presented.

SCENE 13: FORMS OF COMMUNICATION – SPOKEN BASE

Theme: Forms of communication and guide-interpretation strategies



Elaine: "[…] In the spoken base – the speech-based communication – we'll highlight two main forms: Tadoma and expanded speech. These are based on speech, so the guide-interpreter will use the same language the deafblind person uses or understands. […] In Tadoma, the deafblind person places their hand on the speaker's face or neck to feel the vibration of the vocal cords, which helps them understand the sound. I once used this method with a deafblind woman and her sister – both of them used Tadoma. Have you seen anyone else who uses Tadoma, Hilda?"
(Hilda shakes her head negatively)
Elaine: "Just the two of them, too?"
Hilda: "That I attended it was just the two of them, but we know that there are other people who use it, but that I had attendance only the two of them."
Elaine: "And Cristina too! Cristina too, I've already served her with tadoma, so these are the ones..."
Elaine: "[…] in this spoken base that is Tadoma the deafblind needs to be apprehensive of this, so for example, Cristina she learned, she had to relearn the question of speech, so what happens, when she touches her throat and the other person she measures this vibration, and it happens a lot with this deafblind person who learns to speak, who did not know how to speak and learns to speak, is it impossible? It's not impossible, nothing is impossible […]."

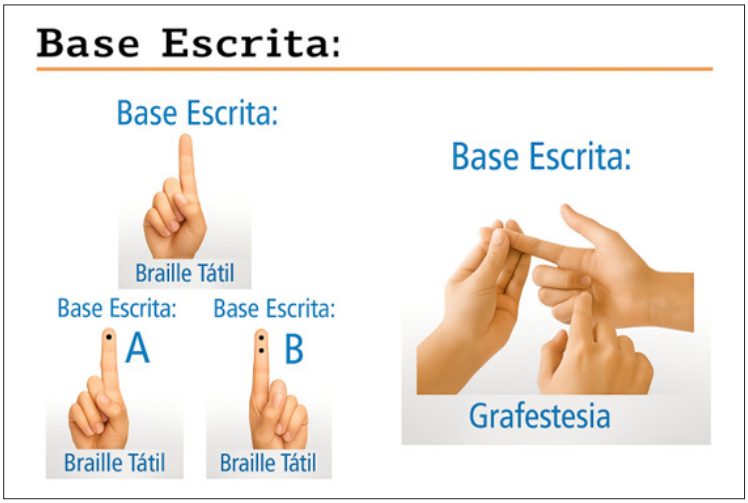
Source: Vilela 2022, 80-1

The written base relates to the guide-interpreter's work with literate deafblind individuals. In Brazil, Braille is used to transpose the Portuguese language into a tactile writing code, enabling reading through touch and the use of assistive devices such as the Braille Display:[2]

2 The Braille Display, or Display Braille, is a very simple device that is able to instantly convert text or data from computers, mobile devices, or an internal memory to a line of embossed text using the Braille System. https://oampliadordeideias.com.br/como-funciona-uma-linha-braille/.

SCENE 15: FORMS OF COMMUNICATION – WRITTEN BASIS

Theme: Forms of communication and strategies of guide-interpretation (see video referring to Scene 14)



Elaine: "The written base, let's talk about **braille** because it has braille writing and also because it has writing on the palm of the hand, which is also based on writing, so if the deafblind person is literate you can use writing on the palm of the hand, which can be on the palm of the hand, sometimes on the back, on the forearm, then each deafblind person has sensitivity in a different space [place of the body] […]."
Elaine: "[…] The written base, look at the Braille, the **tactile braille**, so where is the Braille there, Ashlee, where is Ashlee the Braille? To show us the saddle […]."
Elaine: "**Braille** is not a language, it is a code of a writing, so anywhere on the planet that has the letter A, the Braille code will always be in the same position as the letter A, the letter B, the letter B; the letter C; show Mary to us, Braille cells. Tell Japinha to get it there to show it. So the Braille code is made up of six embossed dots. […] we use tactile Braille using two fingers, index and middle, […] Braille has six points, right? And we have six little pieces of finger look, which is called phalanx people, did you know it was called phalanx? Culture, my God in heaven! Phalanx, these 'little tequinhos' here are phalanxes that call, so they are the phalanges. I learned this by studying, right guys, I didn't know, for me it was a finger weaver; now I know it's a phalanx! So show it to us, Mary, so it's six points, that's it, it's six points, okay?"

SCENE 15: FORMS OF COMMUNICATION – WRITTEN BASIS

"So we count like this: 1,2,3,4,5,6 (do the demonstration with your fingers), […] tactile Braille is very important […]."

Source: Vilela 2022, 70

In communication systems based on Brazilian Sign Language (Libras), the tactile finger-spelling alphabet corresponds to the Portuguese alphabet. In Tactile Libras and Libras in a reduced visual field, the main difference lies in the mode of reception. Tactile Libras is expressed in a tactile-kinaesthetic (haptic) modality, while reduced-field Libras is expressed in a visual-spatial modality adapted to the person's remaining vision.

SCENE 17: FORMS OF COMMUNICATION – LIBRAS BASE

Theme: Forms of communication and strategies of guide-interpretation (see video referring to Scene 14)

Elaine: "[…] and the basis of Libras we have the tactile Libras and Libras in a reduced field, and I remember Chico a lot in this aspect. So, here are some examples, the images, I think you've all seen them, but who hasn't seen them […] Libras is a language, the Brazilian sign language, for example there in Portugal, the language that Márcia is learning: the Portuguese sign language, then the language, has a grammatical, syntactic, morphological, semantic characteristic, which is why it is a language."
https://www.youtube.com/watch?v=X6OxlPDpscQ (0:43′05″-0:44′23″)
Elaine: "[…] And then when we talk about Libras, Brazilian sign language has several forms, and it also fits into other sign languages around the world, so Márcia will also use this base in the same way, only with Portuguese sign language. So it would actually be the tactile Portuguese sign language, and for us the tactile Libras, the Brazilian tactile sign language. Then there is also the issue of the alphabetical base, which is the dactylological alphabet. The typewriting alphabet in Libras is linked in the question of writing. So if the deaf person does not know the letter 'A', you will not make the letter 'A' for him in the typewriting alphabet. It will have no purpose […] it is a type of communication linked to the alphabet, a type of alphabetic communication. Pounds in a reduced field, which is what Chico is using now, right, Nalva? He is using this type of communication that is Libras in a reduced field. During the day when the night is getting [darkening], he loses his vision, then the issue of tactile Libras is better, the tactile Libras is more noticeable to him."

Source: Vilela 2022, 70

3.7 Social-Haptic Communication in the Lives of People with Deafblindness

Social-haptic communication offers rich possibilities for interaction, conveying information in a holistic and embodied manner. As a guide-interpreter, the first author has had several opportunities to use SHC with deafblind individuals and has observed its significance through their expressive responses to the information conveyed.

The first recorded instance of SHC appeared in 1991 in Örebro, Sweden, during the 10th International Congress of Deafblindness, organised by the International Association for the Education of the Deafblind (IAEDB). Riitta Lahtinen introduced the first haptic signs: yes, no, arrival, and exit. Since then, SHC has spread worldwide. The first article on the subject appeared in the Proceedings of the 3rd IAEDB (DbI) European Conference, Potsdam, 1993 (Palmer, Lahtinen 1994).

In Brazil, SHC was introduced years later by guide-interpreters and deafblind individuals who participated in the 10th Helen Keller World Conference, held in the Philippines in 2013. There, they met Kathrine G. Rehder, a Norwegian guide-interpreter, who presented the possibilities of haptic communication. This encounter initiated a process of dissemination through workshops and courses involving guide-interpreters, family members, and professionals working in the field of deafblindness (see Araújo et al. 2019).

As Araújo, Pereira, Santana Júnior (2014, 4) explain, "haptic signs can be created and expanded according to the needs of the deafblind person and the professional who works with them". The authors emphasise the creative potential of SHC in expanding communication possibilities.

A narrative was shared by Acsa, describing how she began using SHC with a person with deafblindness:

SCENE 21: ACSA'S EXPERIENCE IN THE SOCIAL-HAPTIC COMMUNICATION TEACHING PROCESS

Theme: Strategies in tab-interpretation and use of social-haptic communication

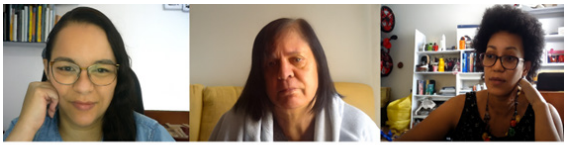
Acsa: "Ouch! Come out girl, look what you're doing to me!"
Acsa: "[…] Cristina, it was wonderful because she endured a lot, I pushed her sometimes. I didn't know, it was awful at first. One experience I had with Cristina was when I spent 5 days with her; eating, sleeping […]. And she kind of jumped on the bandwagon and we ended up learning together."

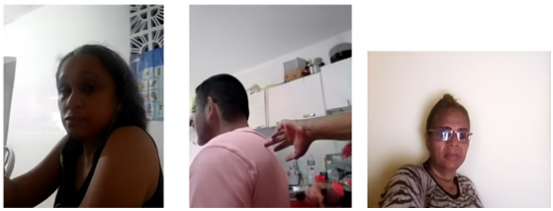
Source: Vilela 2022, 106

Another narrative comes from Charlie, Leandro's wife, who describes the SHC strategies they developed for daily communication and information exchange:

SCENE 23: CHARLIE AND LEANDRO'S EXPERIENCE

Theme: Strategies in tab-interpretation and use of social-haptic communication





Charlie: "[…] as if the communication of the human being is automatic, I had never thought about social-haptic communication; but, as difficulties arose in everyday life, I developed some signs without knowing anything, for example, I started to warn Leandro on the back, that of leaving with the little fingers to walk, and develop without knowing the signal to wait."

Source: Vilela 2022, 109-10

During the course, Charlie demonstrated the strategies and skills she has refined over time, sharing new signs she developed to communicate with Leandro. Through these shared SHC signs, we can perceive the richness and creativity inherent in human language development.

4 Linguistic Aspects of Social-Haptic Communication in Relation to Languages of Different Modalities

Although languages operate through different modalities, they share a fundamental property: smaller, meaningless units combine to form meaningful ones. In Portuguese, an oral-auditory language, phonemes combine to form morphemes and words. In Libras, used by the deaf community within the gestural-visual-spatial modality (Quadros et al. 2000), and in Tactile Libras, which operates in the gestural-tactile modality, cheremes (Stokoe 1960; Capovilla 2011) combine to form signs. The chereme represents the smallest unit of hand movement, just as the phoneme represents the smallest unit of sound.

In SHC, haptices – that is, haptic-tactile-kinaesthetic signs – are composed of minimal units called haptemes (Lahtinen 2008). The following table summarizes the comparison of different linguistic systems:

Table 1 Linguistic comparison

Linguistic system	Public	Minimum units	Meaningful units
Portuguese	Hearing People	phonemes	words
Brazilian Sign Language	Deaf People	cheremes	signs
Social-Haptic Communication	Persons with deafblindness	haptemes	haptices

5 Conclusion and Implications for Practice and Research

The research presented in this article, based on the activities of the GEPICSH (Study and Research Group on Inclusion and Social-Haptic Communication), reinforces the understanding that social-haptic communication possesses structural characteristics comparable to those of natural languages, allowing for grammatical and systematic organisation.

From the narrative experiences of guide-interpreters and people with deafblindness, the need for recognition of SHC as a legitimate language becomes evident, with direct implications for professional training, the development of public accessibility policies, and the promotion of inclusive practices. This study represents an important step forward in the field of research on deafblindness and communication.

The research reported here also opens avenues for further investigation and proposes the establishment of foundational frameworks for building a coherent communication system – not only for people with deafblindness, but for all individuals who perceive the world through seeing, hearing, and feeling with the body.

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Touch and Haptic Sensations in Conversations Between Deafblind Signers and in Tactile Interpreting

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Abstract This study explores how individuals with acquired deafblindness perceive touch and haptic sensations. Using authentic conversational data, it examines how deafblind signers experience and exchange tactile signals alongside sign language, including hesitations and incomplete expressions. The research compares peer interactions with tactile interpreting, noting differences in how interpreters use touch on hands, arms, and backs. Findings reveal that deafblind signers employ hands, arms, and knees for tactile communication, highlighting distinct uses of haptic sensations and expanding understanding of semiotic resources in tactile discourse.

Keywords Social-haptic communication. Deafblind. Tactile conversation. Tactile signing. Touch and haptic sensation. Corpus analysis.

Summary 1 Introduction. – 2 Haptic Communication and Its Different Approaches. – 3 Data and Methods. – 3.1 Data from the Corpora of Tactile Swedish Sign Language Corpus. – 3.2 Data from Field Observations. – 4 Findings and Discussion. – 4.1 Turn-Taking and Pragmatic Context. – 4.2 Pointing with Haptic Sensation. – 4.3 Providing Feedback from the Audience. – 4.4 Depicting and Describing the Situation. – 4.5 Haptic Signals or Haptic Description. – 5 Conclusion.

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1 Introduction

Deafblind individuals with acquired deafblindness have different hearing and sight loss types, which may have occurred at different times in their lives (Raanes, Berge 2017). This includes deaf or hard-of-hearing people with Usher syndrome, which results in limited vision or blindness. Approximately 400 individuals are included in the Swedish Usher Register (Wahlqvist et al. 2020). The communication systems used by deafblind people for face-to-face interaction vary greatly, according to the perceptual preferences and needs of the individual. Most deafblind individuals using tactile sign language first knew a visual sign language and afterward switched to the tactile mode.[1] Deafblind signers use tactile signing by physical contact through the hands of their interlocutors. In this way, they formulate signs and utterances using their own and the other interlocutor's body to co-form utterances, which may entail sign construction (Mesch, Raanes, Ferrara 2015). Social-haptic communication consists of touch and haptic sensations performed on the signer's body (arm, hand, back, knee, foot), providing brief messages revealing key happenings in the context (e.g., someone is leaving the room, the audience is laughing) (Lahtinen 2008; Volpato, Mantovan 2021; Manns et al. 2022).

Subsequently, this paper addresses several challenges associated with studying tactile signed languages using corpus linguistics as a methodology. Corpora allow researchers to observe language patterns based on larger datasets of semi-spontaneous and elicited data (Mesch 2023). Moreover, the corpus contains authentic materials wherein deafblind signers may hesitate and produce incomplete expressions, which are inherent parts of natural conversations. The study pursues two central research questions: a) What types of haptic signs and signals are employed in the corpus examples, and b) In what ways does the use of haptic signs and signals differ between conversations among deafblind interlocutors and interpreted events?

Additionally, the study investigates the pragmatic situations when deafblind signers receive touch and tactile sensations and sign utterances and how they exchange between signs and touch/haptic sensations. Furthermore, observations are noted about how interpreters use touch and haptic sensations.

1 Edwards, Brentari 2021; Mesch 2001; Manns et al. 2022; Willoughby et al. 2018.

2 Haptic Communication and Its Different Approaches

Researchers use the term 'haptic' in many different ways, potentially leading to confusion. In physiology, haptic feedback means movement or touch of an object on the skin – for example, many smartwatches give haptic feedback by pulsing on the wearer's skin to give notifications. In this sense, all deafblind signing is haptic since it is perceived through touch. However, the term is also used more specifically in the literature (e.g., Volpato 2023).

In social-haptic communication, haptices are brief tactile messages, such as touches and signs on the arm, hand, knee, and back of a deafblind person (Lahtinen 2008). Lahtinen et al. (2012) describe haptices as codes for individuals with a dual sensory loss to convey information about the actual environment and emotional feedback of individuals or audiences. A haptice is also semiotic by using different signals and handshapes for describing, for example, pressure, speed, length, pause, movement, and direction (i.e., haptemes in Lahtinen 2008). For other researchers on deafblind signing, haptic communication is often synonymous with communicative resources that are not found in the associated visual sign language. For example, a sign (handshape, e.g., index hand for the Swedish sign TOILET) is articulated on the interlocutor's upper arm instead of the signer's chest.

In interpreted meeting situations with several deafblind participants and their sign language interpreters, haptices can be used for signaling turn-taking. One example is showing where in the room the speaker is located. Another example is to signal to a deafblind participant to wait his/her turn, which is done by the interpreter using their hands to cover the deafblind participant's hand(s). In addition to interpreting linguistic information, interpreters for persons with deafblindness also commonly provide environment descriptions (Raanes, Berge 2021), including pointing, showing direction and marking location.

Environmental description provides a wide repertoire of multimodal tools such as signs, fingerspelling, bodily movement, and orientation (Raanes 2020). In Gabarró-López and Mesch (2020), we see how environmental information is conveyed to deafblind participants by sign language interpreters in the context of a guided tour of a cathedral. In this context, the interpreters use various strategies, such as tactile sign language, locative points, drawing shapes on the palm, touching objects and elements with hand and foot, and walking at a distance. Hardly any haptic signs are used during this tour. In the interviews with deafblind visitors discussed in the project undertaken by Raanes and Mesch (2019), one participant said that part of the reason for this was that she had only one interpreter with her on the tour. She had a backpack on her back, so the interpreter

did not use any haptic on her back, but only haptic signals placed on the arm and hand.

Haptic signs are mostly provided by sighted interpreters or guides. Volpato (2023) shows the pragmatic, contextual factors in the use of haptics in different communicative contexts as activities where deafblind participants receive haptics from sighted or deafblind providers, such as 'you can start', 'go straight', 'no'.

Protactile communication is another approach to deafblind signing popular in the US. Centered on the notion of co-presence, its distinguishing features include co-articulation of descriptions of tactile and proprioceptive iconicity of objects as well as forms of backchanneling used reciprocally by both deafblind signers and any sighted/hearing partners in the interaction (Edwards 2015; Edwards, Brentari 2021). A deafblind researcher, Lisa Van Der Mark (2023), shows increased use of protactile communication outside of the US and made an experiment of two types of descriptions in tactile sign language and protactile signing with the purpose to show a deeper understanding of receiving touch and haptic sensations.

Regardless of the communication approach used, touch and haptic sensations are important resources for pragmatic, contextual use and turn-taking in tactile signed language. One example is pointing to the interlocutor's chest, so the receiver can feel a touch for addressing a turn. Touching and tapping one's hand/finger on a deafblind interlocutor's hand serve as backchannel markers, while the positioning of the hands in the signing space – both relative to the signer and the addressee and on the dimension of height – can be cues used to signal turn taking (Mesch 2001).

Further examples of the use of touch and haptic sensations are given in Mesch and Raanes' (2023) analysis of conversations between a Swedish deafblind and a Norwegian deafblind signer. In this cross-signing context, we see touch and haptic sensations used for intersubjective and pragmatic cues. For example, backchannels 'tapping' or emotional marker 'laugh' is made on the interlocutor's knee, but also the drawing of a question mark on the knee to signal that the previous utterance was a question, not a statement (Mesch, Raanes 2023).

Mesch et al. (forthcoming) describe how when deafblind signers locate referents/elements in space, their movements are more emphasized. This reminds us that emphasis and stress are themselves also types of touch and haptic sensation that carry meaning in deafblind interactions. For example, a deafblind signer produces an abrupt movement with the hand that is placed on the interlocutor's hand in order to indicate that there is a chair against the wall by a depicting sign for CHAIR articulated by the right hand and depicting a sign for WALL articulated by the left hand (see also Holmström, Mesch 2018).

Willoughby et al. (2018, 253) mention the use of haptic signs for simple and quick communication when the deafblind person is attending to another matter – such as indicating food options while walking around a buffet table. The term 'touch and haptic sensations' is used by Manns et al. (2022) to describe duality, where touch is what I do to you, and haptic sensation is the result that you experience. Each action in tactile signed conversations has both a touch and a haptic sensation component. It inspired me to use this term in this study. My paper aims to investigate the rendition of deafblind individuals' use of touch and haptic sensations in conversation and observe how deafblind individuals receive different types of touch and haptic sensations in different activities.

3 Data and Methods

Data for this paper falls into two types – that collected as part of corpus-based projects, and that collected as part of field observations to search answers to the two research questions. The focus in all cases are interactions in Tactile Swedish Sign Language (*taktilt svenskt teckenspråk*, Tactile STS). The research corpora consist of spontaneous and elicited conversations, wherein deafblind signers may hesitate and produce incomplete expressions, which are authentic materials in natural conversations. The annotation scheme for basic annotations is employed for selected portions of the data in ELAN.[2] The data obtained from field observations are added in order to show similarities and differences in touch and haptic sensations from real-world settings where participants are acting as spectators to the actions of third parties. The composition of each data set is described in detail below. In all cases, participants have given express consent for their images to be shown in academic publications, as well as corpus participants consenting to the archiving of their data in line with the processes outlined in the project's ethics application (in some cases, consent was not given, and the face is hidden, as in figure 4b below).

2 ELAN 6.9 (2024) is a software developed by the Max Planck Institute for Psycholinguistics (available at The Language Archive, `https://archive.mpi.nl/tla/elan`).

3.1 Data from the Corpora of Tactile Swedish Sign Language Corpus

The selected conversational data is from the Tactile Swedish Sign Language Corpus, which consists of 4:30 hours video recording with four cameras from the dyadic (and triadic) conversations of 8 deafblind signers (5 female, 3 male), aged 38-77, mean 55. The project was financed by Mo Gård Research Fund (Mesch 2023). The elicitation method for data collection differs from other sign language corpora because of the limited possibilities of using a picture book, cartoons, or video for elicitation. The elicitation task is such as 'touch to explore objects and tell', and the objects are a dollhouse and its furniture, two unmatched fruits of apple and pear, and two unmatched pairs of gloves. However, free conversations were also recorded, as was the case for other visual corpora of Swedish Sign Language (Mesch 2016).

The other selected conversational data of Tactile Swedish Sign Language is from The Corpora of Tactile Norwegian Sign Language and Tactile Swedish Sign Language, funded by the Norwegian University of Science and Technology and the Royal Norwegian Society of Sciences and Letters, and contains 25 hours of data (Mesch, Raanes 2025). It involves two Swedish and two Norwegian deafblind signers (three females and one male, age +50), alongside eight interpreters. The study employs diverse data collection methods, including tactile elicitation tasks, interviews, dyadic conversations, cross-signing, interpreted discussions, visits to the Deaf Museum and Nidaros Cathedral, and conversations during breaks. Participants also shared meals and engaged in guiding, descriptions, presentations, and formal and informal discussions over three days. This comprehensive approach captures various aspects of tactile communication and social interaction among deafblind individuals and interpreters.

3.2 Data from Field Observations

Field observation serves as a supplementary method in this study, utilizing a small dataset of video recordings obtained through private recordings (with full consent as outlined above) of deafblind participants' social engagements, collected for research purposes and for use as teaching sign language interpreting students at Stockholm University (Mesch 2022). The aim is to contrast touch and haptic sensations used by sighted interpreters/providers with those used in tactile conversations between deafblind signers. The vignettes used in this paper have a total duration of four minutes and cover environmental descriptions from four activities where three deafblind individuals were spectators or participants: an ice hockey match, a horse show, a game of golf, and lecture by a deafblind individual where she was the lecturer.

4 Findings and Discussion

The section presents the findings of data analysis and discussions of the use of touch and haptic sensations. Subsection 4.1 focuses on the use of touch and haptic sensations in turn-taking and pragmatic context in conversations between two deafblind signers, with the purpose to find which types of haptic signs and signals are employed in the corpus examples (research question 1: what types of haptic signs and signals are employed in the corpus examples). This stands in contrast to the further subsections, which discuss the use of haptic signals in tactile interpreting (research question 2: in what ways does the use of haptic signs and signals differ between conversations among deafblind interlocutors and interpreted events). Subsection 4.2 begins this discussion by exploring pointing with haptic sensation in tactile interpreting, while subsection 4.3 discusses how audience feedback and interpretation of a PowerPoint presentation is conveyed during a lecture of a deafblind lecturer. In subsection 4.4, I discuss the use of haptic sign depicting and describing situations such as ice hockey matches and horse shows. The section closes with a case study on haptic signals/haptic description during a golf activity in subsection 4.5.

4.1 Turn-Taking and Pragmatic Context

One example is shown in figure 1, which shows how two deafblind peers communicate with each other. Humor and laughter appear, and they are conveyed through body movement, hand movement, and touch on their interlocutor's hand and knee. Touch and haptic sensation convey laughter in conversation. The signer A to the left shakes with her claw hand on B's knee, and the signer B to the right taps once with her hand on A's knee.

Figure 1
Touch and haptic sensation convey laughter in conversation (corpus data from Mesch, Raanes 2025)

Earlier, some research described similar observations in conversations among deafblind individuals, where touch and haptic sensations focus on turn-taking, including feeling turn levels and backchannels (Mesch 2001; Raanes 2006; Willoughby et al. 2018).

Touch and haptic sensations manifest differently in tactile conversations between two deafblind individuals than in interactions involving a deafblind individual and a provider/interpreter. Mesch and Raanes (2023) outline various instances, such as pointing at the interlocutor's chest or an object, palm-up gestures for turn-taking, tapping on the hand or knee to signify agreement, sensing subtle laughter movements, and drawing a question mark on the knee to signal confusion. In dyadic conversations, the signer may not only sign on the interlocutor's hands but also utilize their arms or fingers, intending certain meaning and enactment as semiotic elements (Mesch, Raanes, Ferrara 2015; Van Der Mark 2023).

4.2 Pointing with Haptic Sensation

In tactile interpreting, touch and haptic sensations are employed in various ways, especially when articulation on the deafblind receiver's back is not feasible. As an example, for pointing with haptic sensation in figure 2, the interpreter points toward an object and moves with a distinct endpoint, indicating its location to the right (see Gabarró-López, Mesch 2020). Consequently, the deafblind individual can perceive a slight hand movement with an abrupt motion.

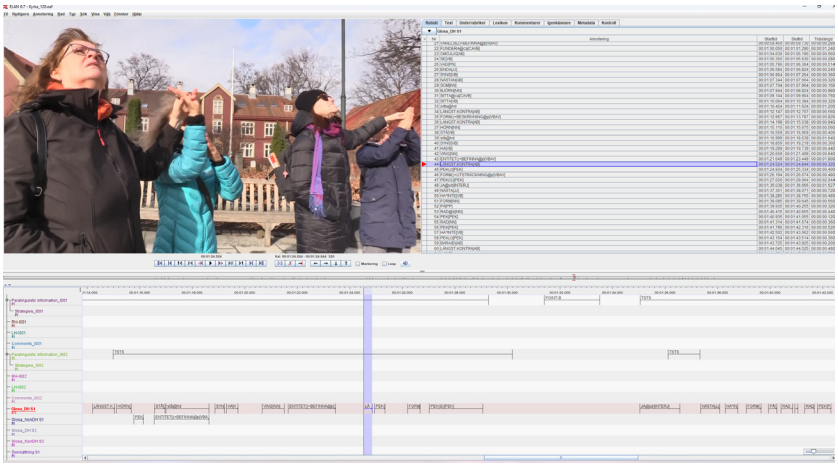


Figure 2 ELAN screenshot where the interpreter (in turquoise coat) points towards the object with a flat hand, and the deafblind recipient feels the direction of pointing with an abrupt movement (corpus data from Mesch, Raanes 2025)

Pointing markers and other signals are crucial in touch and haptic communication, particularly in environmental description. For instance, a provider may point on the back of a deafblind individual to indicate that a video recording has started, demonstrating someone pressing the start button of a video camera, as depicted in figure 3.

Figure 3
A pointing marker on the back of a deafblind individual lets her know about the start of the video recording
(corpus data from Mesch, Raanes 2025)

4.3 Providing Feedback from the Audience

This is an example of how touch and haptic sensations are used in lecturing, which was the first activity recorded as part of the field observation study. The deafblind lecturer gives a lecture for sign language interpreting students in the classroom. The interpreter/provider articulates on the lecturer's back what is happening in the classroom, where they are sitting in a half circle, if one of them is walking in or is distracted, or if there are no questions from the students. She taps on the lecturer's upper arm when the lecturer turns toward her and asks her to tap the next PowerPoint presentation picture **[figs 4a-b]**. Sometimes, she switches to tactile signing to clarify what is said or happening.

Figure 4a
The provider stands behind the deafblind lecturer and articulates diverse signals on the lecturer's back

Figure 4b
The provider taps the lecturer's upper arm to show that she can start (a field recording with consent form)

4.4 Depicting and Describing the Situation

One primary use of articulating tactile signs, touch, and haptic sensations on the back of the deafblind individual is to describe the current situation and environment. A deafblind individual can receive this information simultaneously with tactile signs from a sign language interpreter, while a provider gives touch and haptic sensations behind the deafblind individual.

Figure 5
The provider articulates with two fingers to show WALKING down on the deafblind individual's back as the horse moves forward in the arena (a field recording with consent form)

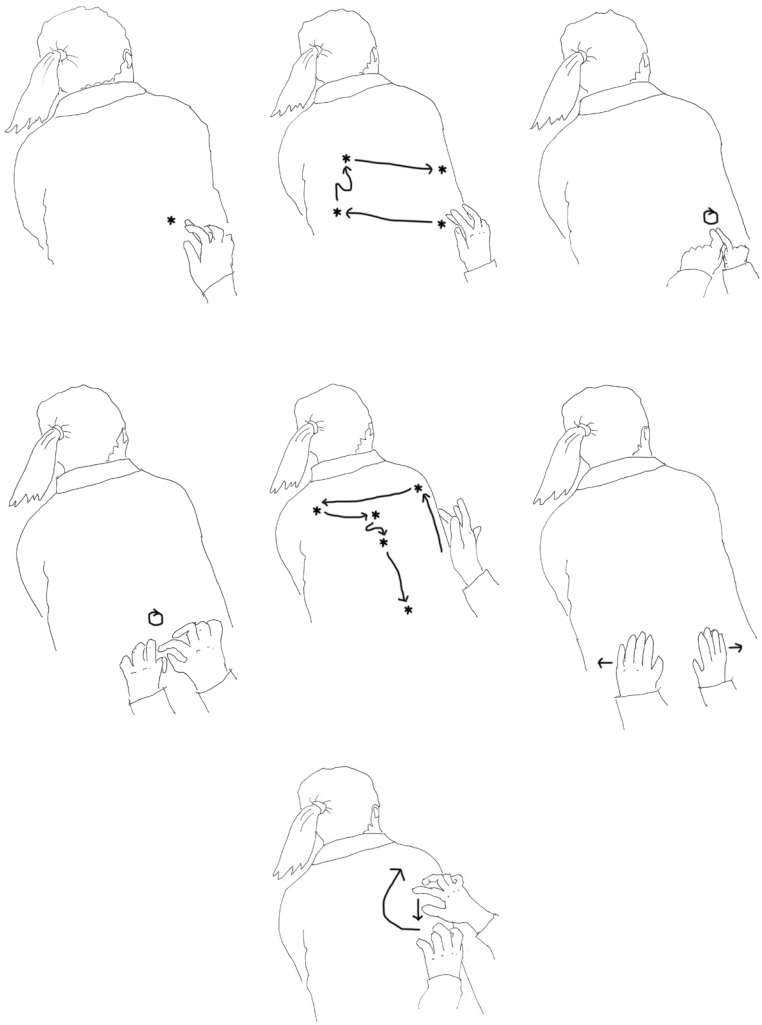
The description of a horse show **[fig. 5]** was the second activity recorded in the field observation study. The provider conveys the actual situation, articulating the horse's path on a deafblind individual's back, while the other interpreter gives a Tactile STS interpretation. The provider articulates with two fingers to indicate the horse walking (down) on the deafblind individual's back to represent how the horse is moving forward in the arena. Then the provider articulates with two index fingers to show that the horse hesitates and backs up a little. The deafblind receiver asks the interpreter, "Back up? Which horse?". The provider signals EAT on the deafblind individual's back as the interpreter describes the scene: the horse handler offers something from the box of balls to the hesitant horse. Eventually, the horse walks over the box, signaled by WALKING

FINGERS down the back. The receiver asks, "Did the horse walk over? Successful?". The interpreter confirms, and the provider touches the recipient's back reassuringly.

The third activity recorded within the field observation study is one deafblind individual's experience watching an ice hockey match. The picture in figure 6 shows the back of a deafblind individual and the starting point of a description where a provider moves her hand to show the situation in the ice hockey game, while the other interpreter provides Tactile STS in front. The provider continues articulating with the right hand to describe the path of an ice hockey player skating around the rink toward the goalkeeper. Different hand shapes represent various players, such as a middle finger for one player, two middle fingers for two players, and a claw hand for several players. Using the middle finger may be easier for feeling emphasis than the index finger. Occasionally, while articulating the path on the deafblind individual's back, the provider switches to the sign SKATING with the side of the hands to indicate player movement, then resumes using the middle finger to denote skating trajectory.

Figure 6
With the right hand and sometimes with the left hand, the provider articulates a description of the path of the ice hockey player skating inside the hockey rink toward the goalkeeper (a field recording with consent form)

Let us closely examine some details of the haptic description **[figs 7a-g]**. The provider touches the deafblind individual's back and indicates the location of an ice hockey puck **[fig. 7a]**. Mirroring the actions of the ice hockey player, the provider moves her right hand in different directions with some stops **[fig. 7b]**. When two players are competing closely, the provider articulates with both index hands to show their game **[fig. 7c]**. Then, when many players form a scrum, the provider articulates with the claw hands moving in a circle **[fig. 7d]**. Then, a player skates on the rink's edge, moving in different directions and finally towards the goal. The provider articulates with the right hand to describe the path of the ice hockey player skating around the rink toward the goalkeeper **[fig. 7e]**. The provider articulates both hands apart from each other to describe the referee's gesture WASH OUT **[fig. 7f]**. Then, the provider articulates both claw hands moving in a circle to describe that the players go toward the exchange **[fig. 7g]**.



Figures 7a-g. The sequence of the (selected) haptic description of the ice hockey match and environmental information (illustration: J. Mesch)

4.5 Haptic Signals or Haptic Description

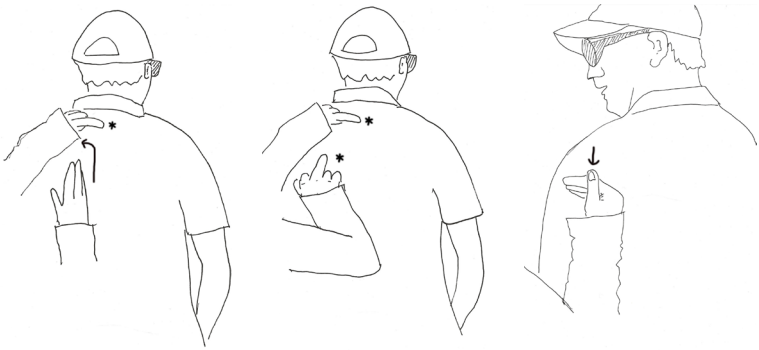
In the fourth activity recorded within the field observation study, the provider assists a deafblind golfer in tracking a golf ball's flight path and direction. Initially, the provider helps position the golf ball and places a golf club blade behind it **[fig. 8a]**. With two taps on the golfer's arm, the golfer is prompted to start. The golfer feels the golf ball through an easy touch with a golf club blade and hits it. After hitting the ball onto the fairway, the provider touches the golfer's back and indicates the location of a golf flag with the left index finger and gestures with the right hand to show the flight path and direction of the golf ball **[fig. 8b]**. As the ball veers slightly left of the flag, the golfer turns to the provider, who articulates with an angled hand on the upper arm to convey that the ball is slightly behind the flag. Then the provider signs tactilely ACTUALLY NICE AND GOOD on the golfer's hand.

Figure 8a
The provider helps the deafblind golfer find a golf ball position

Figure 8b
The provider articulates with the left index finger as a point where a golf flag is located and with the right hand to show a path for the flight and direction of the golf ball
(a field recording with consent form)

Here is a close study of the haptic description. The provider touches the golfer's back, indicates the location of the golf flag with the left index finger, and articulates with the right hand to show the flight path and direction of the golf ball that veers slightly left of the flag **[fig. 9a]**. The provider points to the back where the ball has landed

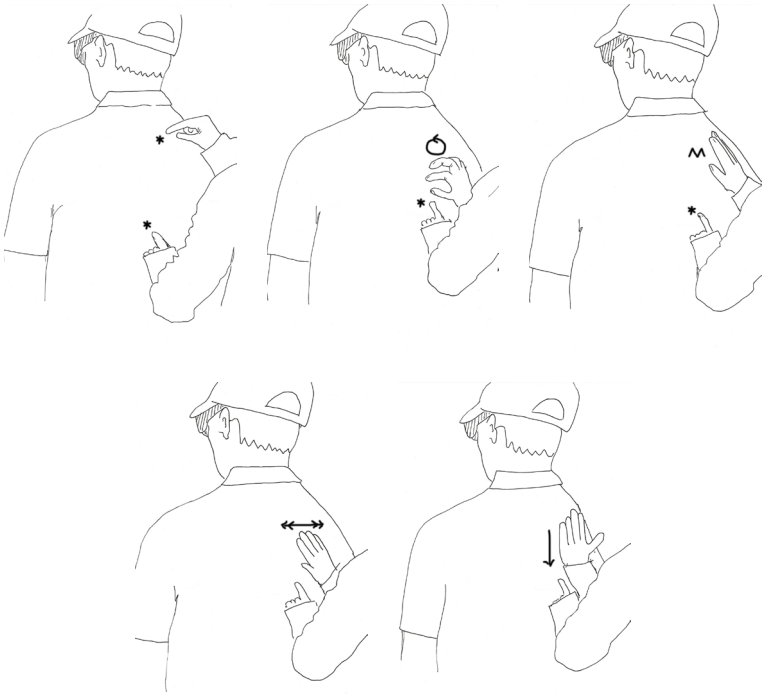
behind the flag **[fig. 9b]**. Then the provider articulates with an angled hand on the upper arm to convey that the ball is slightly behind the flag **[fig. 9c]**.



Figures 9a-c The provider indicates the flag's location with the left hand, articulates the path with the right hand, and indicates the ball's location with the right hand. The last illustration shows that the deafblind person wants to know its location of the ball, so uses speech to ask the provider. The provider has an angled hand moving down on the upper arm to convey that the ball is slightly behind the flag (illustration: J. Mesch)

Another example is from the next hole, where the provider indicates the location of a golf flag but this time with the right hand and articulates with the left hand (index finger) to show the flight path and direction of the golf ball **[fig. 10a]** and stopped in the middle of the path. The provider articulates A BUSH with the right hand **[fig. 10b]** and lets him know that it is finished with a tapping twice with the right hand **[fig. 10c]**. But the golfer wants to know if it is outside of the fairway (speaks to the provider). The provider replies NO by shaking the right hand **[fig. 10d]**. The provider articulates the border of the fairway with the right hand moving down **[fig. 10e]**.

Effective communication requires negotiation between the deafblind individual and the interpreter. There is growing interest in conventional social-haptic communication emerging in the various national communities (e.g., the contributions about social-haptic communication in this volume). However, the examples in this study show that at least in this context, what is being used is not conventionalised haptic communication. Rather, deafblind people and providers make use of flexible haptic descriptions that respond to the specific demands of the communicative context they find themselves in.



Figures 10a-e The sequence of the haptic description of the golf ball's location and environmental information (illustration: J. Mesch)

5 Conclusion

In this article, I have set out the ways in which deafblind individuals use touch and haptic sensations in peer conversation, and contrasted these with observations of different types of touch and haptic sensations used by providers and interpreters when undertaking various activities. A key finding is that haptic communication is used quite differently across these two contexts, and that this relates to the different sensory access of deafblind interlocutors versus sighted interpreters and providers. Deafblind signers in conversation with each other mostly use touch and haptic sensations to give backchanneling, laugh or clarify something in a pragmatic way, while interpreters tend to use haptic sensations more for conveying information, environmental description or actual message.

In further studies, it could be interesting to look for pragmatic signals in touch and haptic modulation, such as topic or focus information. These haptic inputs might also encode focalization

strategies. It would also be interesting to explore spatial signing and body-related semiotic strategies, like bodily enactments or constructed action in tactile signing. As part of this, it would be instructive to elaborate in the data analysis how cognitive processes are taken into account in this study. Deafblind signers receive touch and tactile input, along with contextual information resources. Tactile perception adequately fulfills the cognitive demand for language use, so it investigates cognitive processes in future studies.

Multimodality, including tactile interpreting and conversation, enhances communication during manual activities. Studies on tactile signed languages often rely on datasets with few participants and interpreters/providers in specific situations. By expanding the scope of these studies to encompass larger datasets and more varied communicative contexts, researchers can gain a broader understanding of how interactions unfold and produce theories that better account for the full gamut of communicative resources drawn on in deafblind signing contexts. This is where the development of corpus methods becomes a valuable opportunity for advancing knowledge in the field.

In conclusion, the study underscores the intricate dynamics of tactile communication and social interaction among deafblind individuals, shedding light on the diverse methods and resources employed in facilitating communication and understanding. Through meticulous data collection and analysis, the research deepens our understanding of touch and haptic sensations, and tactile signing within deafblind communities. The corpora of Tactile Swedish Sign Language offer invaluable insights into the lived experiences and communication strategies of deafblind individuals and interpreters, contributing to intersubjectivity. The findings underscore the importance of continued research and support for tactile communication methods and the deafblind community. An ongoing focus on the tactile modality for communication can enrich tactile signing and bodily interaction further.

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Depiction Beyond Hand Touch in an Interpreter-Mediated Setting Using Tactile Norwegian Sign Language

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Abstract This paper presents data from Tactile Norwegian Sign Language (TNTS) focusing on signs that are realized on the body of the deafblind person ('tactile sign language haptices'). It answers the question of how depiction can be expressed on the body of a deafblind person beyond hand touch in an interpreter-mediated setting with a goal that is two-fold: i) provide a classification of TNTS haptices and their interaction with depiction; ii) present the case study of the TNTS haptice blow realized on the body of the deafblind person not through touch, but through air vibration in a flow of air out of the interpreter's mouth.

Keywords Tactile Norwegian Sign Language (TNTS). Interpreting. TNTS haptices. Depiction. Haptices beyond hand touch.

Summary 1 Introduction. – 2 Tactile Sign Language, Social-Haptic Communication and Protactile. – 2.1 Use of Tactile Communication in Interpreter-Mediated Settings. – 3 Depiction in Visual SLs. – 3.1 A Model for Depiction in TSL: Depicting TNTS Haptices. – 4 Methodology. – 5 Realization of TNTS Haptices Beyond Hand Touch: BLOW. – 6 Discussion and Conclusion.

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1 Introduction

The World Federation of the Deafblind (2022) defines deafblindness as "a combined vision and hearing impairment of such severity that it is hard for the impaired senses to compensate for each other". Deafblind people can experience different degrees of deafness and blindness, which affect their preferred communication mode. This choice also depends on their language background (if they are primarily sign language users or users of a spoken language) and therefore also on their onset of deafness and blindness and its timing, and the severity of hearing and sight impairment. Their preferred communication mode can be affected as well by their development of communication skills, which depend on the opportunities they had to be exposed to the deafblind community and thereby on their access to language (Mesch 2001, 9-12; Raanes 2006, 22; Willoughby et al. 2018, 2). The different communication modes used by deafblind people involve tactile communication and research focusing on them is a growing field. The research field around the study of how tactile communication is characterized in its linguistic features, for example how tactile sign languages (TSLs) differ from visual sign languages (SLs), or the linguistic description of how TSTs are used in interpreting settings, is fairly recent. More work has been dedicated to the study and development of social-haptic communication, a system of signals primarily used to convey environmental information and the interlocutor's emotional feedback through touch. The terminology to describe social-haptic communication in linguistics terms has been developing since the work by Lahtinen (2008), who introduced the term 'haptices' to refer to the touch messages expressed on the body of the deafblind interlocutor and the term 'haptemes' to refer to the formational units of these tactile signals. For Tactile Norwegian Sign Language (TNTS), most work has been dedicated to the description of how deafblind people communicate and how social-haptic communication is used in interpreting settings (Raanes 2006; Berge, Raanes 2013; Raanes, Berge 2017; 2021).

Looking now at one of the aspects that characterize visual SLs, depiction is conveyed through SL modality specific constructions. Depiction is mainly used to demonstrate an event through the use of signs that visually represent meaning (Liddell 2003, 261). Its use in TSLs both by deafblind signers and TSLs interpreters is however understudied.

This paper aims to contribute to the description of the strategies used by interpreters to convey rendition, which are utterances that have a corresponding counterpart in the source language, from spoken Norwegian to TNTS, paying particular attention to depicting structures. The focus will be on signs that are realized by the interpreter on the body of the deafblind person while using

TNTS, which we will refer to as 'tactile sign language haptices' (TSL haptices) to distinguish them from the haptices used in social-haptic communication ('social-haptic communication haptices'). The goal of this paper is then two-fold: i) we provide a classification of haptices in TNTS and their interaction with depiction in an interpreter-mediated setting; ii) we then present the case study of the depicting haptice BLOW used in an interpreting setting, which gets realized on the body of the deafblind person not through touch, but through air vibration in a flow of air out of the interpreter's mouth. The overarching goal of this work is to answer to the question of how depiction can be expressed on the body of a deafblind person beyond hand touch in an interpreter-mediated setting using TNTS.

The data presented in this paper have been obtained from a larger data collection within the project *Signed Language Depiction as an Engine for Promoting Inclusion, Communication, and Translation (DEPICT),* a four-year project funded by the Research Council of Norway. The main goal of the project is to investigate how depiction is used in different language environments where Norwegian Sign Language (NTS) is used. The data presented in this work are situated within the work package *Depiction in Deafblind Interpreting*, which focuses on the description and analysis of depictive strategies in the signing of deafblind individuals and interpreters who use TNTS.

This paper is organized as follows: we first introduce the different deafblind tactile communication modes presenting tactile sign language (TSL), social-haptic communication and protactile, in section 2; we also present the existing research on the use of tactile communication in interpreter-mediated settings (§ 2.1). Before focusing on the properties of TSL haptices, the signs realized on the body of the deafblind interlocutor while using a TSL, we will talk about depiction and some of its properties in visual SLs (§ 3). In section 3.1, we propose a model to categorize social-haptic haptices and the TSL haptices used in depicting structures in an interpreter-mediated setting, based on previous work on TNTS. In section 4, we present the methodology that was used for the data collection and annotation, and in section 5 we will explain the unique realization of the depicting TNTS haptice BLOW through the use of air vibration in a flow of air out of the interpreter's mouth. In section 6 we discuss the data presented and conclude.

2 Tactile Sign Language, Social-Haptic Communication and Protactile

Among the different communication modes used by the deafblind community, it is possible to find tactile sign language (TSL), social-haptic communication (SHC) and protactile. Depending on the degree of deafblindness, the timing and order of onset of impairment in both senses, the language background, the communicative skills and the light conditions in case of residual vision, a deafblind person might prefer to combine visual SL or spoken language with communication modes that involve touch perception, for example, social-haptic communication.

TSL is a tactile adaptation of a visual SL, and it is often used by people who already know a visual SL before losing their sight (Checchetto et al. 2018, 1). The main feature of TSLs is that language is perceived through touching the hands of the person signing (Mesch 2001, 3). Among the different adaptations of the visual SL, we find an important use of signs to express grammatical meaning that it is conveyed by non-manual markers such as facial expressions and body movement in the visual SL. This is the case of the use of the sign QUESTION to introduce an open question in tactile Italian Sign Language (LISt), while in the visual SL this aspect is expressed through the spreading of furrowed eyebrows over the signed sentence (Checchetto et al. 2018, 19). A similar case is found in Tactile American Sign Language (TASL) with the use of the sign RIGHT at the end of confirmation questions (Willoughby et al. 2018, 9).

Social-haptic communication, instead, is a system of brief tactile messages realized on the body of the deafblind person to convey environmental information, emotional feedback of the interlocutor(s) or directions, and they are also used to facilitate engagement in hobbies and leisure activities, and to describe other visual or auditory information such as art and music (Lahtinen, Palmer 2008, 9; Lahtinen et al. 2012, 269; Raanes, Berge 2017, 92-3). Some of the signals are an adaptation of visual SL signs to be produced on the body of the deafblind person, for example the sign for TEA in TNTS. Its moment is realized downwards on the deafblind person's upper arm by their interlocutor, producing a movement similar to the sign TEA, which in visual NTS is realized in the neutral signing space (Bjørge et al. 2013, 67). Other haptic signals are created ad-hoc by the deafblind community (Volpato et al. 2021, 29). Social-haptic communication can be used by both sighted and blind individuals in communication with a deafblind or sighted addressee and they are very often used in interpreting settings.

As for protactile, it has been developed by the deafblind movement 'pro-tactile' in the Seattle area in the U.S. with the aim of building and promoting interactional conventions through which deafblind

people are fully participating in society (Willoughby et al. 2018, 3). Protactile is a language, according to Edwards and Brentari (2020, 819). It is perceptible through touch, it is realized as often as possible on the body of the interlocutors, and environmental information is organized along tactile lines (Granda, Nuccio 2018, 4; Edwards, Brentari 2020, 821; Edwards, Brentari 2021, 3). Protactile requires the creation of new norms around intimacy and personal space given the high degree of touch involved (Willoughby et al. 2018, 3). Edward and Brentari (2020, 826-8) explain how, for example, to represent the shape of a lollipop, the interlocutor can use the whole forearm of their addressee instead of using shapes in the neutral signing space. The main characteristics of protactile are reciprocity, contact space, protactile perspective and tactile imagery (Granda, Nuccio 2018, 7-14), meaning that both interlocutors engage in actively using each other bodies to convey through touch information that are usually expressed in the neutral signing space in TSL (Van Der Mark 2023, 506). Protactile has been mostly used in conversations among deafblind people, but it has been developing its use also in interpreting settings, at least in the U.S. (Granda, Nuccio 2018, 2).

2.1 Use of Tactile Communication in Interpreter-Mediated Settings

As presented in the overview by Gabarró-López and Mesch (2020, 2-3), only a few studies have been conducted on how tactile communication is characterized in its linguistic features in interpreting settings. For Tactile American Sign Language (TASL), Frankel (2002) investigates how two deaf sighted interpreters convey negation from visual ASL to TASL. Metzger et al. (2004) focus on non-rendition, which are utterances that do not have a corresponding counterpart in the source language, in visual ASL, TASL and English. Another study is by Edwards (2012) who analyses the visit to a park in Seattle and focuses on the strong use of depicting structures employed to explain the different activities happening at the park. For TNTS, Berge and Raanes (2013) and Raanes and Berge (2017; 2021) look into the coordination and use of turn-taking in an interpreter-mediated meeting with five deafblind people and five respective hearing sighted interpreters, focusing on the social-haptic signals that were employed to ensure the communication flow. For Tactile Swedish Sign Language (TSTS), Gabarró-López and Mesch (2020) investigate rendition by two hearing sighted interpreters from Swedish to TSTS during a guided visit to a cathedral, focusing on how environmental information was conveyed through different haptic strategies such as locative points to show locations, drawing on the hand of the deafblind individuals to depict shapes, giving object to them so they

could study the shape and surface of objects, touching elements such as the pillars, the walls and the chairs with the hands, or also the floor surface with their feet. Similar work has been done by Raanes (2020) and Raanes and Berge (2021) to study how interpreters use haptic signals when describing environmental information in TNTS.

The data presented in this current study focus on yet another aspect of TNTS interpreting by looking at TNTS used in an interpreter-mediated lecture. The data focus on how depicting signs are adapted into depicting TNTS haptices on the body of the deafblind person, also exploring the realization of these signs not through hand touch but through air vibration in a flow of air from the interpreter's mouth, like the case of the TNTS haptice BLOW, which will be analysed in this study.

3 Depiction in Visual SLs

The expression of movement and the description of objects, animate referents and actions can be conveyed through the use of a diverse semiotic repertoire. One of the strategies used is depiction, which refers to the ability of some signs to visually represent meaning (Liddell 2003, 261), and which therefore involves the use of signs and grammatical structures with a high visual component. Depiction is mainly expressed through the use of depicting signs, constructed actions and constructed dialogues. Depicting signs are mostly verbs whose handshape allows to represent a moving referent specifying certain aspects of the action. It can indicate the specific movement of the legs, for example, or identify if the referent belongs to a certain category of animate or inanimate referents. Depicting signs can be used to represent a referent using a handshape that conveys the image of the whole referent or represent how the referent can be manipulated. They can also refer to lexical signs with a depicting/iconic component (we will refer to them as 'lexicalized depicting signs'). Constructed actions and constructed dialogues, instead, are complex structures used to report actions, thoughts, or utterances using the whole body of the signer, where the signer is 'taking the role' of the referent that performs them in the discourse (Liddell 2003, 157).

Due to their highly visual component, depicting structures are considered iconic. Perniss and Vigliocco (2014, 2) have defined iconicity as "any resemblance between certain properties of linguistic/communicative form and certain sensorimotor and/or affective properties of corresponding referents". To contribute to the debate related to the nature of iconic signs in visual SLs, Hodge and Ferrara (2022) propose a model where iconic signs are the results of the overlap between the main categories of signs in a visual SL **[fig. 1]**.

Hodge and Ferrara (2022) adopt the Semiological Approach and Cognitive Linguistics frameworks to SLs, which identify three main methods to create language: 'indicating', 'depicting' and 'describing' (Liddell 2003, 262; Clark 2016, 324). 'Indicating' refers to how people refer to time and space references using indexes, such as indexes with the function of pronouns or indexicals. 'Depicting' consists in depicting signs, constructed actions and constructed dialogues. 'Describing' is the class of signs that includes all conventionalized signs that are not depicting or indicating. In Hodge and Ferrara's (2022, 7) model in figure 1, the triangle represents an utterance in a visual SL and the three main sets are not meant to be closed, but semiotic categories with the potential of expressing iconicity. Hodge and Ferrara's (2022, 7) model wants to provide a more precise categorization of iconic signs, which can be reconceptualized in four possible overlapping of the sets 'indicating', 'depicting' and 'describing'. Looking at figure 1, iconicity in Hodge and Ferrara's (2022, 7) model can manifest in 'depicting and indicating signs' (ID), in 'depicting and describing signs' (DD), in 'depicting, indicating, and describing signs' (DID), and in 'depicting signs' alone (Depicting).

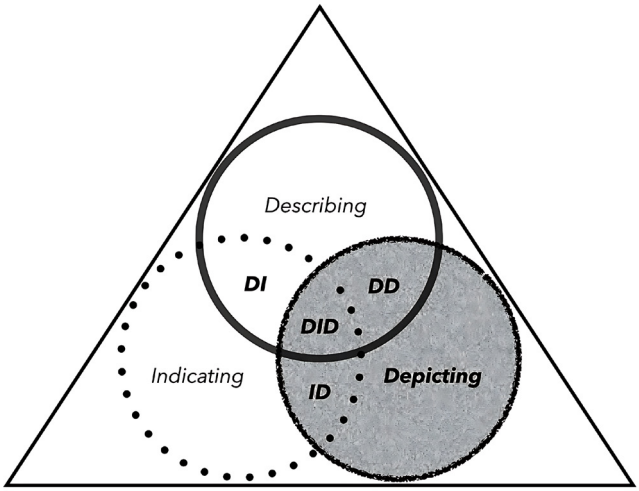

Figure 1 Hodge and Ferrara's (2022, 7) model for the categorization of iconic signs in visual SLs (image reused with permission)

Taking Hodge and Ferrara's (2022, 7) model for the description of visual SLs, in this paper we adapt this model to be able to better categorize haptices in TSLs in an interpreting setting. In order to do so, we will not enter the details of the nature of iconicity in visual SLs. The key aspect we will focus on is the area in the language

representation in figure 1 where depicting signs and lexicalized depicting signs overlap.

3.1 A Model for Depiction in TSL: Depicting TNTS Haptices

A clarification in the terminology that is used in this paper needs to be addressed. The tactile messages realized on the body of the deafblind interlocutor in social-haptic communication have been generally referred to as 'haptices' meaning 'touch messages' (Lahtinen, Palmer 2008, 8; Volpato 2023, 34), but also as 'haptic signals' and 'haptic signs' (Raanes, Berge 2017, 92; Gabarró-López, Mesch 2020, 3). 'TSL haptices' are instead signs used in a TSL discourse and realized on the body of the deafblind person by the interlocutor (Zorzi et al. 2025, 3). They are signs used in a TSL whose point of articulation moves from the neutral signing space or the body of the signer to the body of the addressee, the deafblind interlocutor. We will refer to this class of haptices as 'TSL haptices'. We can see an example of the TSL haptice TOUCH in TNTS in figure 2 produced by a hearing sighted interpreter on the body of the deafblind interlocutor.

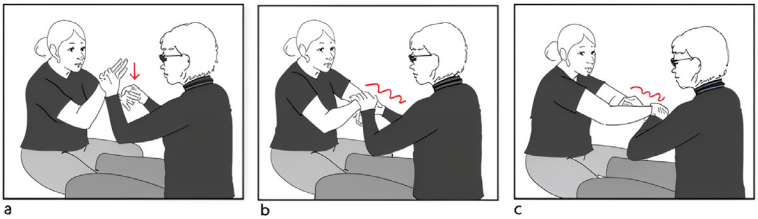

Figure 2 Realization of the TNTS haptice TOUCH on the body of the deafblind addressee (reused with permission from Zorzi et al. 2025, 3)

As we can see in figure 2, the TNTS haptice TOUCH is realized on the arm of the deafblind person. The haptice in figure 2 is used to express that a girl is touching a visitor's clothes to feel them and identify the person. Importantly, this example is produced under a constructed action, and this is an aspect that might help to identify depiction as one of the factors for the use of TNTS haptices by the interpreter on the body of the deafblind person.

In order to properly define TSL haptices, we propose to categorize them as a set of signs in TSL that overlaps with the set of haptic communication (any type of communication that involves the touch modality, including social-haptic communication). Given that our data consist mainly of depicting constructions and lexicalized

depicting signs, we will only look into TSLs haptices that are depicting. In figure 3, we can see that TSL and haptic communication, which includes social-haptic haptices, are two separate sets in tactile communication. This is due to the fact that social-haptic communication is made of signals that have been systematized and adapted ad-hoc to mainly convey environmental information. TSL, instead, is an adaptation of a full-fledge SL.[1] Thereby, it is important to distinguish the two categories, but at the same time, as we can see in figure 3, our model proposes that there is an overlapping between the two sets.[2] Taking into consideration only depicting signs, it is very common to find depicting features in the haptices used in social-haptic communication, for example, and it is possible to find TNTS signs that are realized in a haptic fashion, hence realizing depicting TNTS haptices. Therefore, in the A set, we can find depicting signs in TSL that are realized on the body of the deafblind interlocutor.

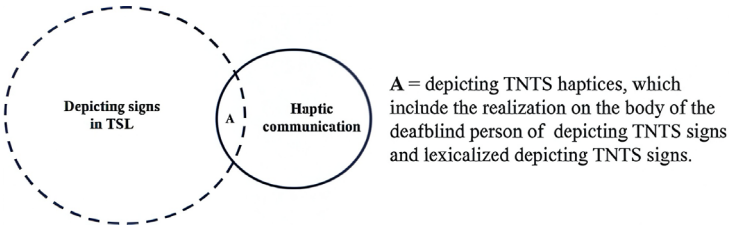

Figure 3 A model for depicting TSL haptices (A) in an interpreting setting (adaptation of the model in Zorzi et al. 2025, 16)

The depicting TNTS sign for TOUCH in figure 2 is then found in the intersection A where depicting signs in TSL and social-haptic communication overlap.

4 Methodology

The data presented in this study consist of a one-hour long lecture interpreted from spoken Norwegian to TNTS. The lecture was about some episodes in the life of the first known congenital deafblind person to learn to speak, Ragnild Kaata.

The interpreter who took part in the video recording is a hearing signer with more than 10 years of experience as an interpreter. The

1 Being an adaptation, though, as pointed out by Checchetto et al. (2018, 1), the status of natural language for a TSL can be questioned.

2 See Zorzi et al. (2025, 15-16) for a more extensive model of TNTS used in an interpreting setting.

deafblind person who was paired with the interpreter was born deaf and was exposed to visual NTS only when she started attending a deaf school. She became blind later in life after learning NTS and nowadays her preferred means of communication is TNTS. Two more participants took part in the study, but we will present data only from one pair of interpreter-deafblind person. As noted by Zorzi et al. (2025, 15), the acquaintance in the relationship between the interpreter and the deafblind person has an important impact on the use of TSL haptices. The two people whose data we present here know each other well. This allows the interpreter to have more comfortable access to the deafblind person's signing space and parts of the body such as hands, arms, and legs.

The data were annotated using the ELAN software (Lausberg, Sloetjes 2009).[3] One of the main aspects that was annotated consisted in detecting the strategies used by the interpreter to adapt NTS into TNTS, with attention to the use of depiction and how depicting structures were realized in the neutral signing space between the interpreter and the deafblind person or on the body of each of them. In this work, we only report the case study of the depicting TNTS haptice BLOW. For other depicting TNTS haptices, see Zorzi et al. (2025, 12-16).

5 Realization of TNTS Haptices Beyond Hand Touch: BLOW

Among the depicting TSL haptices found in the data, there was an interesting example of a TNTS haptice with a depicting/iconic component whose point of articulation is not realized using the hand of the interpreter touching the body of the deafblind person. The sign produced means 'blow (air)', and the interpreter uses air vibration in a flow of air from her mouth to realize the sign on the hand of the deafblind person, making the sign even more clearly understood by the deafblind person. The haptic component of this TNTS haptice is therefore realized not through hand touch, but through air vibration. We can see a representation of the realization of the depicting TNTS haptice BLOW in figure 4.

Importantly, the depicting TNTS haptice BLOW was realized under the depicting construction of constructed action (CA). In example (1), where several instances of the TNTS haptice BLOW are used, the interpreter is taking the role of both Ragnild Kaata and her teacher to explain the action of blowing air out of their mouths to move some paper balls. The citation form of the sign BLOW (air) in visual NTS

3 https://archive.mpi.nl/tla/elan. Max Planck Institute for Psycholinguistics, The Language Archive, Nijmegen, The Netherlands.

is realized by extending all the fingers of the hand moving from the mouth of the signer towards the addressee. As we can see in figure 4, the sign BLOW in our data is adapted into TNTS using a perceptual component of the sign: the air vibration from the mouth of the interpreter to the skin of the deafblind person. The point of articulation of the depicting TNTS haptice is realized by the air vibration from the mouth of the interpreter touching the skin of the hand of the deafblind person that is holding the dominant hand of the interpreter.

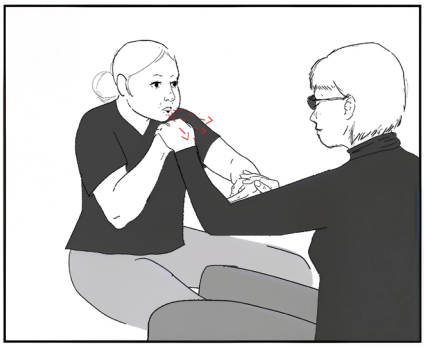

Figure 4
Realization of the depicting TNTS haptice BLOW on the hand of the deafblind person through air vibration in a flow of air from the interpreter's mouth (this image was created specifically for this work)

In example (1), we can see the context in which the TNTS haptice BLOW was used and the glossed example.[4]

(1) Context: Ragnild Kaata is learning with her teacher Elias how to speak using some exercises that involve modulating the flow of air out of her mouth blowing it on some paper balls.

[$_{CA}$ BLOW ROLL BLOW ROLL BLOW-STRONG TRAJECTORY-STRAIGHT TRAJECTORY-DOWN]. (TNTS)

'(They) blew on the paper balls making them roll forward on the table a few times; by blowing strongly on the paper balls they then made them roll off the table, so they fell on the floor'.

The use of CA in the example might be an important factor that influenced the adaptation of the verb BLOW as presented in example (1). Taking the role of the deafblind girl Ragnild Kaata and her teacher, the interpreter is demonstrating to the deafblind person how the action was done. The feedback provided by the deafblind person

4 The video of example (1) with glosses is available at the following link: `https://vimeo.com/911641013?share=copy`.

during the explanation of this event makes it clear that the content was well understood in this context. While the interpreter was signing example (1), the deafblind person commented with the sign FUN (fun). It is important to underline the key role of the feedback from the deafblind interlocutor when evaluating an interpreting strategy and its efficacy for the deafblind person to access the content of what is interpreted, especially when complex structures such as CAs are employed.

6 Discussion and Conclusion

In this paper, we have been contributing to the description of interpreting strategies used in TNTS in a lecture-interpreting setting. A particular focus has been put on the use of depicting structures, depicting signs and lexicalized depicting signs realized on the body of the deafblind person by their interpreter. We referred to them as 'depicting TNTS haptices': depicting TNTS signs and lexicalized depicting TNTS realized in a haptic fashion on the body of the deafblind person by the interpreter. In order to distinguish depicting TNTS haptices from haptices with depicting features used in (social)-haptic communication, the model in figure 3 provides a good clarification of the relation between these two categories. Depicting TNTS haptices belong to TNTS but show haptic features because they are realized on the body of the deafblind person and not on the neutral signing space or the body of the signer (the interpreter).

Interestingly, the depicting TNTS haptice BLOW **[fig. 4]** shows that the point of articulation of TNTS haptices with an iconic/depicting component does not necessarily need to be realized through hand touch. Air vibration in the airflow from the interpreter's mouth can convey the meaning in a more suitable way for sensory perception. It is important to underline that the citational form of BLOW in visual NTS does involve the extension of the fingers, and no component such as a flow of air out of the mouth is present in the lexical sign. The interpreter reshapes the sign BLOW only keeping the most salient and more easily perceivable component of the action: air vibration on the skin of the deafblind person. As far as we know, no research has included such variation of vibrative signals by air blowing as a signal of sensory input in the description of haptices. There is only one instance reported by Fuglesang (1995, 5) of a deafblind person in Norway who uses blowing air on the hand of the interlocutor to express the negative construction 'I do not agree'.

The example of the depicting TSL haptice BLOW presented in this article opens up the possibility of realizing a sensory input beyond hand touch in TSL. The use of props such as feathers or other objects to better explain the nature or use of some objects is well known

in tactile communication (Miles et al. 1999, 124). Their use is not part of the grammatical features of a TSL, though. They anyway underline the importance and potential of touch in its widest sense for deafblind people, including those who do not use tactile SL or other forms of tactile communication methods (see, for example, Watharow, Wayland 2022, 8-9).

The depicting TSL haptice BLOW is then the first description of an instance of a depicting TSL haptice realized using air vibration. It is important to underline that this reshaping of a visual sign into a tactile sign is found in an interpreting setting and the feedback from the deafblind person confirms that the content was clearly understood, therefore consolidating its use in the interaction. It would be crucial to understand if deafblind signers would also use it while communicating with each other.

The two attested examples of depicting TNTS haptices presented in this work (TOUCH and BLOW, figures 2 and 4 respectively) are found under the depicting construction of constructed actions. Depiction can then be one of the factors responsible for the use of (lexicalized) depicting TNTS haptices instead of TNTS (lexicalized) depicting signs. The same has been reported for depicting TNTS haptices in Zorzi et al. (2025, 8). Using depiction, the interpreter uses her body to impersonate the referent doing the action, and in this way, she makes the deafblind interlocutor actively part of the scene that is described.

The fact that the interpreter and the deafblind person in our data know each other well is another factor that allows this high level of integration of the signing space of the interpreter with the signing space of the deafblind person. As presented by Willoughby et al. (2018, 3) and Van Der Mark (2023, 510), the active interaction in the discourse of the two interlocutors and the high degree of intimacy between the two people are two main characteristics of protactile. A frequent use of depicting structures is also another one (Edwards, Brentari 2020, 835). Example (1), where we find the use of the depicting TNTS haptice BLOW under constructed action, is a case where the interpreter merges her signing space into the body of the deafblind person through the use of depiction. The choice of the interpreter to reshape the sign BLOW into the depicting TNTS haptice realized through air vibration may be analysed as an instance of protactile in interpreting, even though very little research is available on this aspect. Especially in the U.S., protactile is more commonly used between deafblind interlocutors, but it has been starting to be integrated in interpreting settings as well. It is necessary to remark, though, that in an interpreting setting, even though the hearing interpreter and the deafblind person may know each other well, there is still a difference in the role of the two participants in the interaction. More research is needed to better understand the use of protactile in interpreting settings, especially in countries

like Norway where protactile itself has not been actively developing in the deafblind community with the same awareness that it has been happening in larger communities of deafblind individuals, as in regions of the U.S.

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Part 3
Social-Haptic Communication in Educational Settings and Other Contexts

Benefits of Using Social-Haptic Communication with Children and Young People Who are Congenitally Deafblind

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Seashell Trust, UK

Abstract This contribution presents the benefits of using social-haptic communication with children and young people who are congenitally deafblind, an area with little research particularly in the UK. It describes some situations in which social-haptic signals can be used in schools and colleges to reduce their isolation and improve their participation.

Keywords Social-haptic communication. Congenital deafblindness. Children. Young people. School.

Summary 1 Environmental Cues for Children and Young Individuals with Congenital Deafblindness. – 2 The Use of Social-Haptic Communication with Children and Young People with Congenital Deafblindness: Some Examples. – 3 Considerations for Implementing Social-Haptic Signals. – 4 Conclusions and Possible Future Research.

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1 Environmental Cues for Children and Young Individuals with Congenital Deafblindness

Children and young people with congenital deafblindness (also referred to as multi-sensory impairments) are at risk of social isolation and being cut off from their environment, even when they have a formal communication system in place. They often miss out on real time information that is happening in the environment, and any information they do receive in real time might be fragmented and distorted, meaning they do not receive the full picture of what is happening around them.

Environmental information refers to something that happens in the environment, such as a fire alarm sounding or the noise produced by other children in the classroom. Often, congenitally deafblind people may be unsure about what those different sounds mean.

Alternatively, they may not be able to hear anything at all and may not understand certain movements around them, e.g., other people moving past them, or if they have to be moved quickly, for example, in case of emergency, in particular if many congenitally deafblind children are in the classroom at once.

Not knowing the location of a sound or the location of other people in the room can cause anxiety for some of the congenitally deafblind students. A person with multi-sensory impairment may have the impression that people often disappear and reappear very quickly.

Communication can also become very directive with these students, rather than conversational, and can often lack spontaneity.

2 The Use of Social-Haptic Communication with Children and Young People with Congenital Deafblindness: Some Examples

There is limited research in the UK on the use of social-haptic communication (SHC) with children and young adults who have multi-sensory impairments. There is some awareness of SHC but it does not appear to be widely used. Our experience is that staff working in schools with young people who have multi-sensory impairments are interested to learn more about this approach. SHC has been traditionally used in populations with acquired deafblindness, but we believe it can be used in populations with congenital deafblindness, too, as well as people who have a diagnosis of autism and learning disabilities.

Some social-haptic signals may be more directional or informative than others, but they are still informing the person about their environment and their surroundings and giving them support in navigating in and relating to the world around them. We present

a number of situations in which SHC can be used benefitting congenitally deafblind children and young individuals. Using a social-haptic signal in circle time in the morning, for example, can give the child or young person more information about who is in the room. This can be started off by letting them know who is next to them at first, by drawing on their back and using personal identifiers and objects of reference.

Social-haptic signals can be really useful for promoting peer relationships and turn taking, by giving tactile cues that don't interrupt the flow of interaction between two people doing an activity together.

Social-haptic signals, when drawn on the back for example, can be an effective tactile communication method for those who have tactile sensitivity in their hands and may find traditional tactile signing difficult, or for those with limited mobility.

For very last-minute changes in the environment such as fire drills, a social-haptic signal like an X on the back can be a quick effective way to communicate what is happening. This may alleviate some anxiety that congenitally deafblind students might experience when an unexpected event happens suddenly and may improve their understanding and participation in these safety drills, particularly if they are paired with a tactile symbol.

Social-haptic signals can also help students with multisensory impairment who are in mainstream school and are independent in many areas of their life but may struggle with joining in conversations with their peers and reading body language and facial expressions.

SHC may also help them with their independence and mobility skills if their communication partner can discreetly tell them where a door is, or if there is an obstacle in their path.

3 Considerations for Implementing Social-Haptic Signals

Like with all communication methods, introducing SHC successfully takes time and consistency. This involves training the relevant professionals to implement these strategies with the child or young person. These can include teachers, teaching assistants and personal assistants, amongst others. It is important to ensure that all staff have knowledge and feel confident in using social-haptic signals and see the value in using them with the children and young people they work with. In a busy school or college environment, it can be hard to find time to teach social-haptic signals and for the person to develop the understanding of what the signals mean, while also making it complement their current communication system. Therefore, it is essential that the staff have access to training and support when learning new approaches and that these are prioritised.

Even implementing one or two signals can be beneficial for the person, so we encourage starting with few signals at a time (also taking the students' capabilities into account; cf. Nicholas, Johannessen, van Nunen 2019). SHC could be introduced in an activity that the person is comfortable in and motivated by, such as a music session for example. Riitta Lahtinen and Russ Palmer talk about describing music through hand movements on the person's body, to connect them to music. Using social-haptic signals in this situation gives more information about the music the students might be hearing (through either a hearing aid or cochlear implant, or any residual hearing they might have) and any vibrations they might be feeling through the speakers or on a resonance board for example (Palmer, Lahtinen, Ojala 2012).

4 Conclusions and Possible Future Research

Increased communication about the environment means that the deafblind person is less isolated and has more interest in their environment. SHC could help the child or young person with congenital deafblindness to locate items and plan routes.

Developing guidelines for the use of SHC with children and young people with congenital deafblindness would also be a good resource for professionals to refer to. Nevertheless, an individualised approach to SHC is also needed, as different individuals may have different needs and capabilities. At Seashell Trust (https://www.seashelltrust.org.uk/), we hope to start implementing this approach on a small scale with some of the students who attend our college, and reviewing how it benefits them.

When implemented consistently, SHC can open up the world for the children and young people we work with.

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Astrohaptices: Touching the Universe

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Abstract People with deafblindness may have space-related hobbies. These hobbies are a way of touching the Universe. The means of making these hobbies accessible include environmental description and social-haptic communication, in particular the astronomy-related subgroup, astrohaptices. The subsystem is evolving but already provides an important tool for the professionals. Astrohaptices can be used with various space-related events and activities. Furthermore, astrohaptices are zoomable to be used within our Solar System and elsewhere in the Universe. They provide tools for making the Universe more accessible for all.

Keywords Astrohaptices. Social-haptic communication. Deafblindness. Haptic exploration. Space exploration.

Summary 1 Introduction – Social-Haptic Communication to Astrohaptices. – 2 Astrohaptices and Haptic Exploration. – 3 Studying Photographs and Images. – 4 Visiting Museums and Touching Objects. – 5 The Universe and Our Place in It. – 5.1 The Milky Way and the Universe as Astrohaptices. – 5.2 Galactical Structures and Deep Space Objects. – 6 Stargazing with Astrohaptices. – 7 Conclusions. – 8 Future Developments.

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1 Introduction – Social-Haptic Communication to Astrohaptices

During an interaction between a person with deafblindness and an interpreter, or a personal assistant, specific issues need to be addressed in relation to touch-based information as well as close interaction between two individuals. In every instance, but especially in the educational setting, people with deafblindness need to have hands-on contact and this can be expanded to other areas of the body, so-called neutral areas (Lahtinen, Palmer, Lahtinen 2010, 120; Lahtinen, Palmer 2012). Any interaction process needs to be agreed between both parties, and this may vary from one individual to another. In all aspects of communication there needs to be a permission to touch and to be touched – and an agreed understanding between both parties. This so-called touch profile may be situation-dependent and variable. In this article, we discuss touch-based methods in connection to space-related interests and hobbies.

People with a visual impairment may be interested in astronomy and space travel, too. Astrohaptices (Palmer 2020; 2021) together with environmental description (Lahtinen, Palmer 2012) offer a way to participate in space-related events even without vision. Astrohaptices are a subgroup of social-haptic communication (Lahtinen 2008). They are developed for a need of more accurate descriptive tools to be used when exploring astronomical objects and participating in space-related events. It uses neutral areas, the hands, the arms and the upper back. You can use it with static objects, such as photos or maps, or dynamically when describing a live event, such as a rocket launch.

Analysis of pre-existing touch-based communication and further development of social-haptic communication originated in the early 1990s via Riitta Lahtinen's work (Lahtinen 2008). By definition, social-haptic communication refers to the interaction between two or more people by touch messages in a social setting. These touch messages are called haptices. Over the years, the social-haptic communication system has been expanded to cover many themes, such as hobbies (football, ten-pin bowling, tandem cycling, riding) and healthcare settings (hospital haptices, rehabilitation-related haptices, home care haptices). In this article, we discuss haptices related to space and the Universe called astrohaptices. These use the body as a reference point related to an object, a photograph or a celestial object you can see either in the sky by naked eye or in an observatory using a high-powered telescope. This is also true for a live event where one can use a combination of IT, tactile models and astrohaptices to enhance the individual's experience in real-time adding to the thrill of the countdown and launch processes as well as the pre- and post-launch events. Furthermore, this will expand the integration of information from different senses together. Most often astrohaptices are used

simultaneously to other means and methods of communication, such as haptic exploration and language-based environmental description, either with speech or signing.

2 Astrohaptices and Haptic Exploration

Usually astrohaptices are used together with haptic exploration. It means that you explore things with your hands. You can do that independently or with a guide. The objects can be part of a touch tour or shop items – or home-made. Home-made objects can be crocheted or made out of cardboard. Touch tour objects are most often replicas or scale models, sometimes miniatures for children. The latest technique is to use 3D printing in various ways.

For example if one studies the Apollo Lunar Module, the lander craft that landed on the Moon in 1969, the current models are often very delicate and need to be handled carefully. Normally one can start from the bottom up, feeling the spidery legs which may or may not be extended from close to open position. This depends on the model in question one uses to explore the details. The legs are supported by little cross-over struts covered in foil, this is called the descent part, which has a big single engine. So by exploring the object stage by stage one is able to build up a picture.

When visiting an actual vehicle mock-up or replica in the museum, it may not be possible to touch the exhibit, so through using a white cane with the help of an assistant or interpreter one might be able to get an idea of the dimensions of the object when standing next to it. Sometimes when exploring the dimensions of the vehicle or an object, one can actually walk around the exhibit to get an idea of the width and depth of it. Using the model replica and manual handling of the miniature model at the same time, it may be possible to explore the intricate details of the vehicle stage by stage.

Sometimes an object is inside a glass cabinet. Then it is not possible to touch these objects, so the assistant or interpreter has to describe tracing the dimensions (shape, size and height) of the object with the person with deafblindness hand-in-hand to get an overall impression. If one is exploring a Moon suit, it may be possible to map the different details (pipes, helmet, gloves and pockets) either by mapping them on the back of the hand or on the person's back according to their preferences. By doing this, the person with deafblindness is able to appreciate in a physical manner what it might be like to wear such a bulky suit on the Moon. There may be additional fabric samples of the materials used in manufacturing the layered garments worn on the Moon. In addition to the different textile samples the describer may show the layered joint patches and how they are assembled together.

Furthermore, some museums offer so-called touch tours where some replica objects may be felt and explored through touch. For example, during a visit to Space Expo Noordwijk near Amsterdam, the Netherlands, there is an opportunity to explore a replica Moon boot from the Apollo mission. Here again, one is able to use haptic exploration to feel the texture of the boot with the many layers plus the rubberised sole of the boot to protect the astronaut's feet. The experience to be able to touch these things enables the person with deafblindness to appreciate the skill and workmanship that goes into making these things protecting the astronauts from the extreme temperatures (at the lunar equator [120°C to -130°C], data from NASA Lunar Reconnaissance Orbiter, 2013).[1]

3 Studying Photographs and Images

When viewing images and photographs, be it in the museums, in periodicals, or online, a person with deafblindness can find it difficult to access these depending on their visual status, varying from narrow field of vision, peripherical vision, to total blindness. In many cases, people who experience narrow field of vision may have memories of seeing images in the past but now find it difficult to see these images in a short timeframe. To enhance the deafblind person's perception of photographs, an interpreter or a personal assistant can draw these images in a number of different ways, on their preferred body location outlining the object in the image, describing the details such as colours, and other related visual characteristics and intricate details of the object in question.

Outlining an image and additional details in it onto the body is often enhanced with linguistic information, be it signed or spoken – or a combination of both. Usually the more varied the description of an image is, the easier the information is to process. Sometimes the individuals prefer the description of the overall picture first followed by the details (Ojala 2011, 34), sometimes vice versa. The previous option follows the order commonly used in signed languages, whereas the latter version follows the order more commonly found in spoken languages. The difference is theorized to be due to the innate nature of these languages (on principles of cognitive grammar and especially figure-ground cognitive processing, please see Langacker 1987 and others). There are individual preferences on the order of description of details, and these often are due to the varying visual status. An interpreter is encouraged to follow the gaze of the individual they are interpreting for to give coherent additional information about

1 See `https://science.nasa.gov/moon/weather-on-the-moon/`.

the image for their client (Bruce, Tsotsos 2005). That is, if the client focuses on the top left corner of the image, then description needs to derive from that corner to be appropriate and coherent to what the person focuses on. Sometimes the interpreter needs to guide the person from one detail to another to help the scanning of the image and thus to get the whole perspective concerned.

Furthermore, the producer needs to understand various methods of social-haptic communication to allow the person with deafblindness experience what is happening in the image concerned. This involves both haptices, haptemes and environmental description combined together. For example if describing NASA's famous Man on the Moon 1969 picture that featured in the Times magazine cover of Edwin 'Buzz' Aldrin **[fig. 1]**, this image portrays him standing on the Moon with his left arm over his chest bent 90° and thus slightly covering the six connectors on his chest, and his legs apart, like standing at ease in the military pose to stabilise his walk as the Moon has 1/6 of the Earth's gravity.

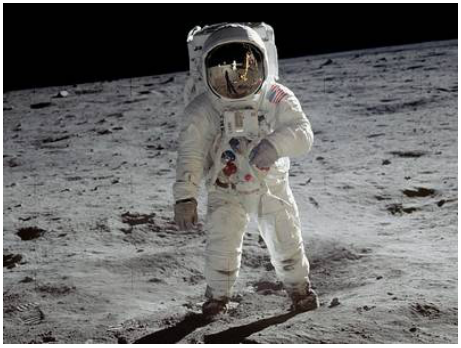

Figure 1
Man on the Moon (image credit: NASA/MSFC; published: 28 June 2018; historical date: July 20, 1969)

Figure 2
A figurine in resin depicting an astronaut on the Moon in a salute pose (photo credit: Andrew Reynolds)

In addition to Neil Armstrong being reflected on his golden visor **[fig. 1]**, behind Aldrin, one can see the blackness of the space with the lunar horizon, while the lunar surface[2] is littered around him with a number of craters along with some small rocks and bigger boulders. In terms of colouring, the Moon surface seems to be very dark grey and dusty with mix of granules similar to regions found in the Arizona desert in the USA.

All of these elements can be portrayed on the person's body by the describer, but the method of doing this depends on the individual's choices. Some people may prefer to have the background of the picture described first followed by the astronaut – or vice versa. This needs to be agreed by both parties beforehand.

For example, the describer may draw on the person's back the square outline of the picture, which may be followed by the actual figure using two hands or two fingers to draw the outline of the astronaut. Similarly, one might use the flat hand to depict the blackness of the sky followed by the Moon's horizon followed by the rocks and craters on the Moon. During the process, the describer may use either spoken language or one-handed sign language to tell more about colours and textures in the image background. Turning to the details on the astronaut, the describer may need to use a series of drawings to illustrate first the astronaut's visor followed by the elements on the suit configurations, such as hoses, buttons, cameras and features on the chest area. Moving down, they may also need to show the arm positions, cross the chest followed by the bulkiness of the gloves. At the same time, the describer may illustrate this onto the body of the person with deafblindness by in effect re-creating the movement and the posture of the astronaut.

2 Carrying astronauts Neil A. Armstrong and Edwin E. Aldrin, Jr., the Lunar Module (LM) 'Eagle' was the first crewed vehicle to land on the Moon. The LM landed on the moon's surface on July 20, 1969 in the region known as Mare Tranquilitatis (the Sea of Tranquility). Meanwhile, astronaut Michael Collins piloted the command module in a parking orbit around the moon. This photo is of Edwin Aldrin walking on the lunar surface. Neil Armstrong, who took the photograph, can be seen reflected in Aldrin's helmet visor. Armstrong was the first human to ever stand on the lunar surface. As he stepped off the LM, Armstrong proclaimed, "That's one small step for man, one giant leap for mankind". He was followed by Edwin (Buzz) Aldrin, describing the lunar surface as magnificent desolation. The Apollo 11 mission launched from the Kennedy Space Center, Florida on July 16, 1969 via a Saturn V launch vehicle, and safely returned to Earth on July 24, 1969. The Saturn V vehicle was developed by the Marshall Space Flight Center (MSFC) under the direction of Dr. Wernher von Braun. The 3-man crew aboard the flight consisted of Neil A. Armstrong, commander; Michael Collins, Command Module pilot; and Edwin E. Aldrin Jr., Lunar Module pilot. During a 2½ hour surface exploration, the crew collected 47 pounds of lunar surface material which was returned to Earth for analysis. With the success of Apollo 11, the national objective to land men on the Moon and return them safely to Earth had been accomplished (NASA Resources: Earth's Moon; see `https://www.nasa.gov/mission/apollo-11/`).

Figure 2 shows a model of the same image of the astronaut in the photograph, but this time the perceiver is able to feel the astronaut in 3D, also including the dusty Moon surface and the smoothness of the golden visor. This enables the person with deafblindness to have a very realistic image to a deeper understanding, including being able to feel the backpack and the cables connected – as well as the left boot where the soil of the Moon's surface has been rippled onto the boot. This also adds the bulkyness of the suit into the picture and how the bulky suit must have been restricting his movement on the Moon as well as his ability to work in the hostile environment. This is due to the fact that the Moon suit needs to have an in-built atmosphere to protect the astronaut inside.

4 Visiting Museums and Touching Objects

When visiting a museum, it is beneficial to start the visit by going to the museum shop first, since very often there are objects that are available to touch in various degrees, depending on the packaging. Even though some of these might be manufactured for children, it may provide a basic outline or shape of the object and thus create a baseline for the future description beside the actual object or objects on display in the museum. There may be various space capsule modules, such as Vostok, Soyuz, Mercury or Apollo available to touch and on display. It is always beneficial to discuss the availability to touch objects in the shop with the shop assistants. This can be useful, as it allows the person with deafblindness to have some preliminary idea of the exhibits on display in the exhibition.

The sense of scale for the person with deafblindness comes from understanding the dimensions of their own body. This is true for every astrohaptice model described in this article. This innate knowledge of the dimensions of your own body is enhanced by the general knowledge about the Universe, which may differ greatly from one person to another. In terms of scale one might use the basic model of the Solar System astrohaptices **[fig. 4]** and its relation to the Milky Way astrohaptice model **[fig. 5]**. This enables the person with deafblindness to understand the layout of our Solar System where the planets are in relation to one another and understand how vast in scale the Milky Way is when the Solar System is represented on the little fingernail of the person **[fig. 5]**. This allows the person with deafblindness to get a deep perspective, which would not otherwise be possible to appreciate.

There may be different diagrams of flight trajectories, such as that of the Voyager probe visiting various planets in the Solar System. This is where one could benefit from the Solar System astrohaptices (see § 5) since the Voyager spacecraft travelled around various planets

for the gravity-assisted 'sling-shot manoeuvre' to save fuel **[fig. 3]**. Sometimes there is a full-scale replica of the spacecraft hanging from the ceiling as well.

The describer may start with description of the probe itself. There may or may not be a small touchable model. If there is not, then one needs to improvise on description of the probe. By guiding the receiver's hand, one can draw the outline of the probe and its main parts to give an idea of the dimensions of the probe itself. The Voyager has three main parts: the high-gain dish-shape antenna that sends the signal back to Earth, then there are two long boom sensor platforms, sensing out magnetosphere and plasma in space. Perhaps the most intriguing part of the Voyager probe is the Golden Disc, that includes description of where the probe originated from and various audio samples of humanity as a species for the extra-terrestrials to find and play.

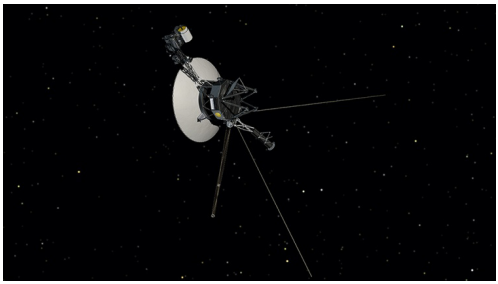

Figure 3
This artist's concept shows NASA's Voyager spacecraft against a backdrop of stars (image credit: NASA/JPL-Caltech)

Once this description has been done, it may be useful to get an idea of how large the probe is. This can be done by walking underneath the exhibit from the main body of the probe to the end of the longer boom structure and there might be further descriptions on the way. The final stage would be to describe the trajectory of the Voyager probe within the Solar System by using the Solar System astrohaptices (see § 5). The Voyager probe trajectory will be outlined by the producer's index finger around the planet placeholders in succession. This is an example of how-to explore spacecraft flight paths within our own Solar System with astrohaptices.

In order to demonstrate the location of the Voyager probe today, one can zoom out from the Solar System astrohaptices and use the Milky Way (see § 5.1) astrohaptices model instead. Currently, Voyager probe is located somewhere in the interstellar space beyond the Oort Cloud and travelling towards the Proxima Centauri. The use of this astrohaptic model of the Milky Way to demonstrate Voyager's flight trajectory gives the person with deafblindness a good illustration on how vast the Universe is. This is how the different structures of the Universe can be portrayed on a zoomable astrohaptices system.

5 The Universe and Our Place in It

There are many space-related documentaries on television and a wide variety of images and diagrams of our home planet, the Earth in the Solar System and its place in the wider perspective, our home galaxy, the Milky Way. Not only do these TV programmes rely heavily on the imagery on screen, but also the presenters very rarely describe what is actually on screen, especially when it comes to diagrams. This is where the astrohaptices were conceptualised in the first instance – to find the Earth in the Solar System. The Solar System astrohaptices are not only a stationary representation of the Solar System but can also be used dynamically when describing orbits, locations, flight paths – whatever is happening out there in the Solar System, including the latest space weather events.

Of course, the description of the Solar System starts from its centre, the Sun. In our astrohaptic model, the Sun is located along the outside of the left lower arm from wrist to elbow. The planets are placed on the fingertips when the hands are side by side in the front, fingers spread, palms facing down and thumbs touching each other **[fig. 4]**. The innermost, so-called terrestrial planets in order are Mercury (left little finger), Venus (left ring finger), Earth, our home (left middle finger), and Mars (left index finger). The outstretched thumbs together represent the Asteroid Belt between Mars and Jupiter. The outermost planets, the gas giants, Jupiter, Saturn, Uranus and Neptune occupy the fingers of the right hand, respectively. The former planet Pluto, which has been downgraded into a dwarf planet, occupies the right little finger knuckle in this model. If one expands this Solar System model to include also the lesser-explored outer edges of the Solar System, we have included the Kuiper Belt and the Oort Cloud as the main structures in this model. The Kuiper Belt occupies the area from the right little finger knuckle to the right elbow along the lower arm while the Oort Cloud respectively stretches from one shoulder to the other. This is a simplistic way to get the planets in order. However, if you want to go further out to the Milky Way, there is a zoomed-out astrohaptices set for it (see § 5.1).

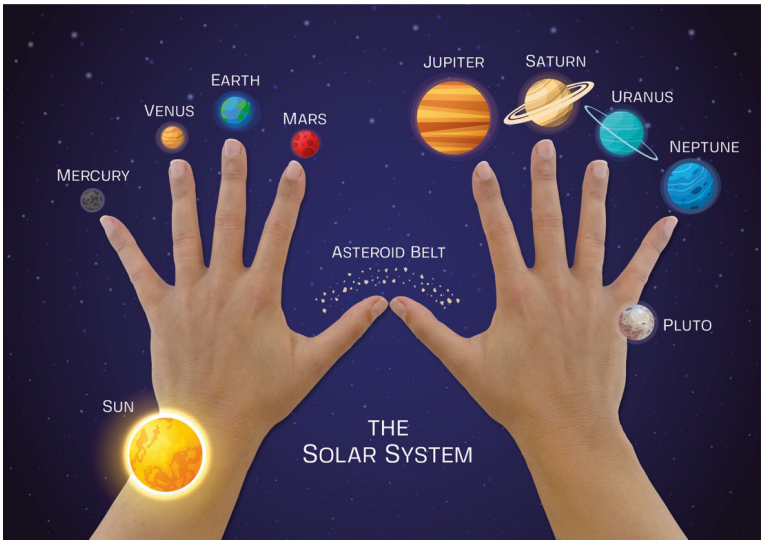

Figure 4 Solar System astrohaptices (image credit: Palmer 2020; reprint with permission)

Figure 5 Milky Way astrohaptices (image credit: Palmer 2021; reprint with permission)

5.1 The Milky Way and the Universe as Astrohaptices

Astrohaptices present a simplified yet powerful version of the various structures in the Universe. We can take our home galaxy, the Milky Way, as an example of this. In the previous section, we had the Solar System spread out through fingers and hands, but in this example we will zoom out and present the Solar System diminished on the small fingernail of the right hand **[fig. 5]**. Now the Kuiper Belt is represented on the first joint of the small finger, and the Oort Cloud is located on the knuckle. Zooming out, moving up towards the wrist, illustrates moving deeper into interstellar space. There we encounter the nearest star to the Sun called Proxima Centauri, which in this model is situated at the place where the wristwatch is. Then we move even further out and deeper into space to locate the Kepler system with nearest exoplanets, halfway between wrist and elbow, up the arm. Exoplanets are planets found outside our own Solar System. Astrohaptices can be used for example in comparing an exoplanetary system with our own Solar System to gain a deeper understanding of the scale and size of the planets and their orbits in the other system. For this type of comparison, one uses the Solar System astrohaptices **[fig. 4]**.

Kepler system was the first star system we found with exoplanets, and some of the planets are located in so-called habitable zone within the system. If we now leave the Kepler system and venture even deeper towards the centre of the Milky Way, the next important waypoint in our journey is the brightest star in the night sky, Sirius, the Dog Star. In our astrohaptices model, it is located on the elbow. We chose the waypoint to be included in our model because it is one of the brightest objects in the night sky, and it may be noticeable even by people with visual impairment.

5.2 Galactical Structures and Deep Space Objects

If we now venture into the centre of the Milky Way, it has a central bulge including millions of stars tightly together. The overall structure of the Milky Way is similar to a firework 'Catherine Wheel', and thus the Milky Way is categorised as a spiral galaxy. The outstretched arms in our model represent the spiral arms of the Milky Way. Just think how small our Solar System is compared to the vastness of our home galaxy. Simultaneously, the model gives the precise location of our Solar System (on the fingernail) within the galaxy. As mentioned before, the head of the receiver portrays the central bulge of the Milky Way. Then the shoulders represent the inner part of the Milky Way where the spiral arms attach, a bar-like structure around the central bulge.

Furthermore, the Milky Way, as many other galaxies, has a black hole in the very centre of the galaxy. That may be either included in the model we have used by opening the mouth or one can study the black hole separately. In that instance, we have developed an astrohaptice for the black hole – a closed fist with the thumb tucked in.[2] The fingers in this model represent the fast-churning matter around the event horizon and the thumb represents the matter disappearing into the black hole.

6 Stargazing with Astrohaptices

It is possible to use haptices to support the functioning low vision, either stargazing at home, or when visiting an observatory where the visitors are allowed to view celestial objects through a big telescope. It is possible where the telescope has two eyepieces, one for a wider view and another one for a more close-up image of the target. The person with deafblindness can stay on the close-up eyepiece and use their time to focus on the object while the describers alternate on the wider eyepiece. The describer looking through the eyepiece verbalises the scene to the other one who draws the image on the back of the person with deafblindness. Or if the person with deafblindness is a sign language user, the description may have to be repeated twice, first with hands-on signing and the other time with simultaneously drawing on their back.

Closer to home, one can use fixed objects when locating celestial objects in the sky. One example of this is to use the top of the roof to direct the gaze to the full moon (Lahtinen, Palmer, Lahtinen 2010). Here the pointing is shared, that is the celestial object is pointed at the both the describer's and the recipient's hands together. Usually the easiest to locate in the night sky is the Moon, be it full or half. A full Moon is easier to locate, but that may bring glare. If there is a strong tendency for glare, then half Moon may be a more beneficial target for stargazing. The half-moon shows the details more in-focus and clearer, especially near the terminator (the edge of the shadow of the Earth on the Moon).

When the Moon has been located in the night sky, one can use that dynamic point to find other bright objects in the sky, such as the planets Venus, Mars or Jupiter. Depending on where you live, the location of these planets varies in the night sky. The describer or interpreter may want to use a sky chart map on a smartphone. However, it is advisable to use the smartphone and its app inside before going out, as using a lit-up mobile app outside will destroy the night adaptation of the eyes and the darkness re-adaptation process takes 15-20 minutes. Another option for the interpreter is to take

a physical star map outside.[3] The map is most often readable also in the dark when the eyes have finished the adaptation process for darkness. You can hold on to the map with one hand and use the other for the shared pointing of the objects with the person with deafblindness.

The star charts are a very useful tool for finding constellations and interesting areas across the night sky. Furthermore, one can use tactile models of constellations (more about readability of tactile maps, please see Ojala, Lahtinen, Hirn 2016) to learn more and to discuss the deep space objects within specific areas, if there is a deeper interest in them. One can also find the locations of the newest finds of the various space telescopes in the sky by using the celestial mapping system (see §§ 5-5.2 above).

7 Conclusions

This article has focused on some of the basic astrohaptices that may be applied when sharing a space-related event with a deafblind person. There may be other areas of interest, such as planetary exploration, live launches or recovery procedures. Today one can also enjoy live broadcasts from the ISS and new discoveries taken by various imaging probes or robotic space vehicles on Mars and perhaps in the future on other planets as well – or our Moon. However, this enables some educational prospects for deafblind people to explore and have a more equal access to a wider media-related information and space-related exhibits displayed in museums. Astrohaptices complement the other accessible facilities in the museums, such as tactile maps, audio descriptive tours or touch tours. These accessibility options are emerging now, as there seems to be more awareness on accessibility among the museum staff when it comes to making their museum more attractive to a wider audience with different types of disabilities.

8 Future Developments

There is scope for expansion in the astrohaptices system, and we welcome other space enthusiasts to help us explore the Universe through astrohaptices even further. This offers one way of bringing the Universe within touching distance. Should anybody be interested in a workshop around astrohaptices development process, please contact the authors on (`https://www.russpalmer.com/`).

3 Thanks to Giorgio Grigi, who initiated the creation of a Black Hole haptice by his question at Hapticconf 2023 in Venice, Italy.

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Haptic Communication and Guide Dog

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Abstract In this essay, experiences with using haptic signals to support the use of guide dogs for people with deafblindness are presented. Learning from these experiences is vital to improve communication between a person with deafblindness and their guide dog. The essay describes data and activities, main findings and considerations of necessary preconditions for positive outcomes. The signals that were used are also illustrated.

Keywords Haptic communication. Guide dog. Deafblindness. Haptic signals. Interpreters for the deafblind.

Summary 1 Introduction. – 2 Data and Activities. – 3 Main Findings. – 3.1 Necessary Preconditions. – 3.2 Need for Different Types of Signals. – 3.3 Satisfaction and Benefits. – 4 Conclusion.

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1 Introduction

In this pilot project, we have tested the use of a series of haptic signals to support the use of guide dogs for people with deafblindness. More specifically, we have evaluated the function and outcome of training situations where a person with deafblindness simultaneously receives haptic signals from a provider and cues from a guide dog. In this project, the provider of haptic signals was professional interpreters for the deafblind. Learning from these experiences is important to improve communication between the person with deafblindness and their guide dog. We will argue that improved communication holds a potential to better the mobility and orientation in the everyday lives of people with these disabilities.

An important goal of the project was to facilitate the learning and strengthening of skills of the interpreter, the person with deafblindness and the dog, to strengthen the partnership between the latter two. The signals had to be easy to understand and use amongst the people close to the persons with deafblindness.

We will shortly exemplify the signals used, developed and tested in this project, along with a link to the webpage providing a full overview and catalogue. The signals included a mixture of signals from the Norwegian haptic platform and new signals established during the pilot project. The signals are described in the book *Haptisk kommunikasjon* (Bjørge, Øverås, Rehder 2013; also see the English version *Haptic Communication*, Bjørge et al. 2015) and in the App Haptics: Pocket edition.

The project is a result of a collaboration between the Eikholt National Resource Center for Deafblindness in Norway (called Eikholt from now), Hapti-Co, i.e., the company which developed the system of haptic signals in Norway (see Hagerupsen et al. in this volume), and guide dog schools.

2 Data and Activities

The data collected for the project consisted of dialogues, systematic observations and reflections with the participants with deafblindness. The data was generated using a process-evaluation design which meant that interviews and observations were conducted in a stepwise manner. The purpose was to gain insight into how the participants experienced and acted in certain situations or contexts. In the open interviews, the participants provided responses step by step.

In a later stage, we invited the participants to reflect on their experiences and describe the usefulness of the signals when practicing with their guide dog. To collect data in a qualitative good manner, we emphasized the development of a safe, trustful

and positive environment between the project managers and the participants.

Pilot – Part 1

In the first part of the pilot, three participants with deafblindness, professionals from Hapti-Co and counsellors from Eikholt participated in a three-day workshop consisting of testing, observations and reflections. The testing began by observing and learning from the interactions between the interpreter, the participant and guidedog, without providing initial instructions. It unfolded in a city environment with trafficked streets and populated areas in the city centre. Subsequently, the parties discussed and reflected on the experiences that were generated, on what worked and what did not work, and what they should change or adjust later in the process.

Pilot – Part 2

From the experiences in part 1, in part 2, we decided to change the surroundings; from the city to a smaller and quieter place at Eikholt, where the testing continued. An important reason was that the dogs became tired from practicing in a noisy city setting. Guide dog instructors from multiple guide dog schools participated. Further reflections and discussions were held after this second part of the pilot.

3 Main Findings

3.1 Necessary Preconditions

The first main finding from the project concerned necessary preconditions for the participant's experience of relevance and practical usefulness of haptic communication. One precondition that we discovered early in the process concerned clarifying the tasks and roles of the interpreter, the participant with deafblindness, and the guide dog. Having clear roles was important for functional communication. For example, in situations with physical obstacles, whilst the interpreter signalled the participant to stop, the dog began to move around the obstacle in accordance with dog training. Such mixed signals however resulted in confusion amongst all three parties and sometimes resulted in insecurity and uneasiness in the dog.

Another example was the need to clarify whose job it was to praise the dog for good behaviour. In some cases, the interpreter praised the dog instead of the participant with deafblindness. Instead, we emphasized that interpreters should signal to the participant when to reward and praise the dog for good conduct, thereby strengthening the partnership between the participant and the dog. Additionally, it strengthens the participants with deafblindness' perception of control and autonomy.

Furthermore, we discovered that the position of the interpreter on the right-hand side of the participant, approximately at arm's length, prevented the guide dog from being disturbed. We emphasised that the dog must guide, and the interpreter shall provide information about the surroundings and the dog's actions. Thus, there are several issues that should be clarified in advance in the cooperation between the different parties.

Another precondition was participant involvement. We learned that systematic participant involvement in all project phases was essential for understanding the need for different haptic signals. Involvement included collecting perspectives, experiences and feedback from each participant in the design process, to develop targeted and user-friendly solutions.

Essential aspects of participant involvement included:

- Co-design – Involving participants provided the opportunity for them to take part in the development of solutions and the design of the project.
- Prototyping and testing – Participating made it possible for the participants with deafblindness to experiment and provide feedback on what worked and not worked in real situations.
- Experimental learning – Learning based on practical experience and active participation constituted an important overall framework for the project. Learning through active engagement in practical tasks and situations, followed by reflection, facilitated the development of knowledge and skills.

3.2 Need for Different Types of Signals

The second main finding from the project was that participants needed to receive a variety of signals to gain information on the behaviour of the dog and information of the surroundings. In turn, this made it possible for them to move safely from one place to another. These signals entailed a mixture of signals from the Norwegian haptic platform and new signals established during the pilot project. The signals included:

- Signals of directions, e.g., touching on the shoulder or arm to indicate whether the receiver of the haptic signal shall turn left, right, or move straight ahead.
- Stop and start signals, e.g., a short firm touch to signal stop and a light repetitive touch to signal start.
- Signals on obstacles, e.g., a gentle touch to warn about a minor obstacle or a more intense touch to suggest a major obstacle.
- Signals of navigation, e.g., signal on approaching a pedestrian crossing by holding the thumb against the palm, spreading the other four fingers and guiding these with the fingertips over the receiver of the haptic signals back. The pedestrian crossing is placed in the previously indicated path and direction.
- Dangerous situation signals, e.g., making a cross sign on the back of the receiver.
- Signals of positive feedback, e.g., the signal DOG is placed on the receiver's back, then a stroke is given with both hands, every other time, with a flat hand on the receiver's back. The signal DOG is given by placing a claw hand on the receiver's back, moving the fingers slightly inwards twice.
- Contextual signals or cues, e.g., the signal DOG given at the top of the receiver of the haptic signals upper arm says that the following signals apply to other dogs and not the participant's own guide dog.

To illustrate signals graphically, here are two examples:

Figure 1
The signal DOG given on the receiver of the haptic signals back says that it applies to the receiver's dog in particular. Claw hand moving the fingers slightly inwards twice (source: the app Haptics: Pocket Edition; copyright: Hapti-Co)

Figure 2
The signal DOG given at the top of the receiver of the haptic signals upper arm says that the following signals apply to other dogs. Claw hand is placed at the top of the receiver's upper arm, moving the fingers slightly inwards twice (source: the app Haptics: Pocket Edition; copyright: Hapti-Co)

A full overview and catalogue of the haptic signals can be found at the following webpage: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.eikholt.no%2Fapp%2Fuploads%2F2023%2F09%2FHaptic-communication-and-guide-dog.docx&wdOrigin=BROWSELINK.

For more information on the app Haptics: Pocket Edition, please go to the following webpage: https://www.eikholt.no/en/articles/eikholt-takes-over-the-haptics-pocket-edition-app/.

3.3 Satisfaction and Benefits

A third and important finding includes the participants' satisfaction and benefits from taking part in the project. The participants were highly satisfied and found the signals easy to understand. Furthermore, they benefited in the sense that the guide dog and the haptic signals from the interpreter created a sense of security. As some of the participants explained:

> "The signals the interpreter gave me along the way gave me a lot of security. Everything that happened around me with the traffic, especially with cars! Then noise from the surroundings, especially with the Roger pen. The haptic signals for curbs up and down, and stairs, gave me the opportunity to give the right command to the dog".

> "It was very nice to be told about crossing roads in advance, especially in a place I'm not familiar with".

> "Great description of what was in the aisles and places in the shopping centre. Then I got more overview and control".

> "Received a signal that there were small dogs on the right, and that we could go to the left, so we avoided a situation where the dog barked and had to show who was the biggest".

Another issue involved an increased sense of control with the dog when receiving haptic signals. One participant said:

> "The timing of the signals is important for me to be able to command my dog. It's very important for the job to flow, to get flow in walking and stopping".

The ability to differentiate and make decisions when the signal from the interpreter and the dog collided was also underlined as a vital learning outcome:

> "We went towards the front door; there was an obstacle. The interpreter signalled it as danger; I chose to ignore the signal and trusted the dog. The dog handled the situation, and then I had an eye-opening experience. I can receive signals but can choose to use them or not. In that way, I also get to check whether the dog is doing the right thing".

4 Conclusion

In the current pilot project, we have tested haptic signals to support the use of guide dogs for people with deafblindness. The purpose was to improve communication and partnership between the people with deafblindness and the guide dog and ultimately facilitate mobility and orientation in their everyday lives. The findings included preconditions for succeeding with the project, the need for different types of signals and participants' satisfaction and benefits. We also provided a link to a catalogue of haptic signals published on the webpage of the Eikholt National Resource Centre for Deafblindness.

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This volume presents a collection of papers on social-haptic communication (SHC) from the first international conference on SHC held in Venice on September 4-5, 2023. SHC consists of brief touch messages (haptices or haptic signals) performed on the body of the deafblind person to convey environmental information, often in combination with other communication modes (tactile or visual sign language, Malossi, etc.).
The volume presents the development and use of SHC in different countries, and the integration of SHC in deafblind interpreting settings and educational contexts. It will be very valuable for professionals in those countries, such as Italy, where SHC was introduced only recently.

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