Signed language Depiction as an Engine for Promoting Inclusion, Communication, and Translation (DEPICT)

1. Excellence

The main objective of this project is to promote the inclusion of deaf individuals into Norwegian society through a deeper understanding of the richly *multimodal* language behavior in which they regularly engage. Multimodal approaches to language and interaction (Svennevig, 2015) allow for not only words and grammar as the tools for communication, but also hand gestures, body postures, eye gaze, and the use of physical surroundings. Without adequately understanding and recruiting these uniquely visual aspects of communication, the quality of inclusion, integration, and interpreting for deaf people who experience the world visually will necessarily be impoverished. Equal access to public services is a stated aim of the Norwegian government (Lande Hasle et al., 2014). Against this backdrop our project centers on the investigation of *depiction* – acts of "showing" rather than "telling" – which are a key aspect of the visual grammar of all signed languages (Liddell, 2003), including Norwegian sign language (NSL) (Erlenkamp, 2011).

1.1. State of the art, knowledge needs and project objectives

Signed languages are fully fledged languages. Their users can therefore be considered members of linguistic minorities (United Nations General Assembly, 2020). From an international perspective, deaf people have historically been more isolated than their hearing counterparts. Yet, when a deaf signer from one country meets a deaf signer from another country, they can communicate far more effectively than hearing people. Gaining this skill is not simply a matter of learning a national sign language. A hearing person learning a sign language will not be able to communicate with a deaf person from another country using sign language as easily. By learning more about this unique skill we aim to understand more about how deaf people communicate, which can contribute to an improved quality of access to society. At the heart of the matter is the use of depiction as a strategy for communication. An example of depiction is when we form a "telephone receiver" with our hand and put it to our ear. Any other person familiar with the concept of telephone will understand something along the lines "I'll call you". Depiction shows meaning through *iconicity*, motivated links between form and meaning. Depiction also relies on the specific contexts in which it is embedded. In this way they partially require a shared experience to fulfill their communicative purpose. Depictions are an essential part of signed languages, and deaf people are skilled at using depictions in conventional and creative ways during interactions. By understanding the ways cultural experience shapes signed language depiction we can better prepare practitioners for effective and beneficial interactions with the deaf communities and individuals they serve. For example, it is unclear to what extent and in what contexts depictions are useful in interpreted interactions and whether hearing or deaf interpreters use them more. To guide our investigations, we put forth the following core hypothesis:

> **The Depiction Engine Hypothesis**
> Signed language depiction may under certain circumstances drive:
> (a) Basic communication without a shared signed language
> (b) Enhanced communicative effectiveness within a shared signed language
> (c) More linguistically and culturally appropriate signed language interpretations

This project will investigate depiction and its role in the communication practices of sign language users. We will investigate this main aim through a cluster of interdisciplinary work packages (WPs): 1) an experimental study of word level iconicity, 2) a vocabulary size assessment controlling for access to sign supported speech among hearing preschoolers, 3) interviews and participant observations eliciting depictions with deaf female immigrants, 4) transcription and analysis of depictions in interpreted communication with deaf interpreters, 5) transcription and analysis of depictions in interpreted communication for deafblind individuals, and 6) an interpreting roleplay and introspection task focusing on depiction with novice, skilled, and deaf interpreters.

1.2. Research questions and hypotheses, theoretical approach, and methodology

The six WPs in this project are outlined below. Each will empirically investigate and test the Depiction Engine hypothesis. A variety of methods and data types will be used, and in some cases multiple WPs will analyze the same data with different approaches. Our multidisciplinary approach reflects DEPICT's ambition to exhaustively capture the facets of depiction in the diverse language *ecology* (Haugen, 1972) of NSL. All personal data collected will follow NSD and GDPR (cf. data management plan in section 4.3). Possible risks include a) failure to elicit community engagement, b) delays/complications in data collection, c) complications in coordination of numerous partners across multiple WPs, and d) ethical considerations of conducting research with vulnerable populations. Risks are anticipated through a) early dissemination goals and pre-project recruitment of community stakeholders as collaborators, b) clear workload expectations, and budgeted partner coordination meetings, c) funding set aside for personnel especially administrative and research assistant positions in addition to PhD and postdoc funding, and d) approval through NSD and training for researchers and collaborators for issues regarding consent in vulnerable populations.

WP1 CULTURALLY SPECIFIC PERCEPTIONS OF LEXICALLY DEPICTING SIGNS

Leader: Benjamin Anible (HVL)
Core participants: Vadim Kimmelman (University of Bergen), PhD 1 (HVL)
1) *To what extent are depictive motivations shared between signers of different signed languages?*
2) *Are depictions with shared semantic factors communicatively expedient?*

Language use is a real-time activity subject to cognitive constrains of attention and automatization that operates in the tug and pull to create understandable communicative acts with the least amount of effort possible (Zipf, 1949). This struggle is reflected in a myriad of different ways *intra*-lingually as the grammar of any given language conventionalizes and changes over time (Bybee, 2006). One way to reduce the effort required for effective communication in *inter*-lingual situations where attentional demands are high and automatization is low because participants are operating without a fully shared linguistic system is to use behaviors that draw more strongly on non-linguistic and other temporally/physically salient experiences. Depictions are likely to be particularly attractive because of their relative independence from conventionality and alignment with shared extra-linguistic experience. However, depictions may not always be truly divorced from entrenchment in cultural or linguistic systems as evidenced by attempts to quantify perceived iconicity of lexical items in signed languages (Occhino et al., 2017). This becomes even more apparent when depictive accessibility is measured in tasks requiring online processing (Anible, 2020). The current study will directly assess the cognitive effort needed to comprehend the motivation of depictive signs from other signed languages using a picture naming task (Grote & Linz, 2003). It may well be that certain concrete concepts are processed as similarly depictive across signed languages, but abstract concepts are not. If so, this would indicate these concepts do indeed provide an effort reducing strategy for creating understanding in interlingual contexts where participants are native sign language users.

Novice and expert users of two signed languages (Russian SL and Norwegian SL) will view pictures of the same concept in two conditions; (a) a picture that profiles the depictive properties of a concept matching those profiled by a sign in their own sign language, (b) a picture that profiles a different set of depictive properties of a concept matching those profiled in the other sign language, (c) a picture that profiles the depictive properties of a concept matching those profiled by a sign in both languages, (d) a control condition where a picture is presented that does not profile either language's motivations. If depiction is subjectively constructed based on language-specific experience, the average reaction time required to produce a sign after viewing condition (a) is expected to be faster than (b). For (c) we expect pictures will be named equally fast by signers of both languages and for (d) we expect pictures will be named slower than conditions (a) and (c). Non-signers will complete the task in spoken English and Russian as control groups. Predictions will be preregistered on the Open Science Framework, response time and accuracy data will be collected in Expyriment (Krause & Lindemann, 2014) and analyzed with mixed linear regression in R (R Core Team, 2019). Anible, Kimmelman, and PhD 1 will share responsibility for research design and analysis and recruiting native Norwegian and Russian SL participants.

WP2 DEPICTION AS A TOOL FOR LANGUAGE LEARNING AND LANGUAGE DEVELOPMENT
Leader: Inger Birgitte Torbjørnsen (HVL)
Core participants: Siv Fosshaug (Vetland), Meghan Matovic–Noddeland (Oslo, Author)

3) *Will Sign Supported Speech increase acquisition and retention of abstract concepts among preschoolers?*

Sign supported speech (SSS) is a type of sign language-based support for individuals with special needs (Daniels, 2001). Recently this tool has been used in kindergarten for language development. Anecdotally, children learn and retain both concrete and abstract words in NSL more easily using SSS. Depiction could be a strong contributing factor. The research project "Use of signs for all children in kindergarten" shows that 57% of the kindergartens in Hordaland county are using signs in kindergarten (Torbjørnsen, 2019). Teachers report children can use visual language to express themselves around the same time as they begin to speak, as has been suggested previously (Bonvillian et al. 1983). Since in Norway children start pre-school well before they have developed a spoken language beyond one-word sentences, the teachers emphasize that use of signs is especially helpful for the youngest children and the immigrant children in the kindergarten. The use of signs in kindergarten has received limited attention in systematic studies. There has been work done on baby signs (Acredolo & Goodwyn, 1988), but Snoddon (2014) argues that these programs may not manage to use the depiction from sign language to their full potential. While some investigations mention depiction as a possible explanation why SSS is helpful, none have studied this explicitly. Signing may help preschoolers be more interested in learning new and abstract words through the humor and playfulness of iconicity (Dingemanse & Thompson, 2020). Another theory why SSS has been such a widespread tool in kindergartens could be that the inherent depictive aspects of signs helps the children understand/learn words more easily. SSS might bootstrap learning of abstract concepts from connections to concrete ones – a core property of metaphor in signed languages. There is evidence that this is the case for adult learners of ASL (Morett, 2015).

Through interviews, recordings, and testing this WP will explore the depicting features of SSS and its role in learning. Participants will be hearing kindergarten teachers and kindergarten children (hearing, deaf and/or hard of hearing), and their parents who are already using SSS. The aim is to create an environment as close to the ordinary learning environment as possible. Children will be divided into two groups of between 5–10, both with the same teacher and balanced for language development for one month. One group will work on learning abstract words using SSS, and the other without. Twenty abstract words from the Norwegian version of the British Picture Vocabulary Scale (BPVS) will be used (Lyster et al., 2010). Before starting the data collection, a questionnaire will collect parents' measures of the children's knowledge of the abstract words chosen. We will also video record at least one training session of each of the groups as well as the conversations between the child and the teacher. Video recordings both of the group sessions as well as the testing sessions will use video cameras placed to capture the teacher's and the children's communication. Recordings will be analyzed using Conversation Analysis (Goffman, 1983). Torbjørnsen will be responsible for research design and analysis. Fosshaug and Matovic–Noddeland will be responsible for recruiting and interviewing participants at participating kindergartens, and a research assistant will assist with data collection, transcription, and analysis.

WP 3 DEPICTION IN COMMUNICATION WITH DEAF FEMALE IMMIGRANTS
Leader: Elisabet Trengereid-Olsen (HVL), and/or PhD 2
Core participants: Gro Hege Saltnes Urdal (HVL), Ingeborg Skaten (HVL), Maren Sørhaug (Nygård skole voksenopplæring)
External: Lubna Mehdi (Signo), Christina Zullo (Skullerud voksenopplæring)

4) *What do female deaf immigrants report regarding linguistic possibilities and obstacles of living in Norway?*
5) *What type of depiction can be identified in different communicative situations involving deaf female immigrants?*

The aim of this WP is to explore the barriers and opportunities deaf female immigrants experience in Norwegian society, through an investigation into their communication strategies with a focus on depiction. Deaf women have had little to no focus in previous research studies, and research that solely

investigates adult female deaf immigrants in Norway is lacking. Some studies do involve deaf immigrant women in mixed gender groups (Kristoffersen & Storhaug, 1995; Sinkaberg, 2017). This research focuses on inclusion into society and the system prepared to help. Kristoffersen and Storhaug (1995) find that language proficiency is important for deaf immigrants in a new society, and reduced access to language in general is an obstacle for independence. Sinkaberg (2017) states that language deprivation and lack of education in childhood influences how deaf immigrants cope in the Norwegian society. These aspects are also substantiated in international research. A survey focusing on the life situation for deaf men and women in 93 countries found few countries deny deaf people access to education, government services or equal citizenship based on deafness alone. Thus, many deaf people experience discrimination, particularly in developing nations, and are not able to enjoy even basic human rights (Haualand et al., 2009). Signed languages are national like spoken languages, and many deaf female immigrants do not know NSL upon arrival in Norway. General language deprivation in childhood can also aggravate the communication situations in a new country. In such cases, International Signs (IS) can be used to establish interaction with deaf immigrants (Stone & Russell, 2015). IS, though not a national sign language, is used as a communication method in these situations – consisting of depictive and visual elements from different national signed languages (M. Hansen, 2016; Hiddinga & Crasborn, 2011). Depiction is a natural part of IS and the degree to which shared experience governs the affordance of depicting utterances and language constructions, is an open question. Deaf women may have had limited opportunities to interact with people outside of restricted environments prior to arriving in Norway, and therefor limited experience with co-constructing the *intersubjectivity* – shared understandings and experiences – needed to successfully deploy culturally appropriate depictions. It may also be that the universal nature of depictions is sufficient to be understood without shared cultural experience or that the experience of being deaf trumps cultural differences.

All participants in the study for this WP are deaf female immigrants or refugees. Data will consist of videotaped dialogue between five to seven participants gathered through interviews and participant observation. The interviews will be made via professional deaf sign-language interpreters, recruited internationally. The interviews will mainly deal with the situation of the deaf female participants, but one part of the interviews will be dedicated to WP4, with the aim to identify depiction in negotiation of meaning between the deaf immigrant and the deaf interpreters. A list of culturally specific Norwegian concepts will be used for topic areas in the interviews. Analysis will assess the degree participants are able to recruit these cultural norms in their depictions. Trengereid-Olsen and/or PhD 2 will take main responsibility for research design and analysis. Sørhaug and Mehdi will assist in recruitment of participants, organizing the interviews and public dissemination of results. Sørhaug and Trengereid-Olsen will transcribe the data. Trengereid-Olsen, Skaten, and Urdal will analyze results.

WP4 DEAF INTERPRETERS' DEPICTING WHEN CREATING INTERSUBJECTIVITY

Leader: Ingeborg Skaten (HVL) & Gro Hege Saltnes Urdal (HVL)
Core participants: Elisabet Trengereid-Olsen (HVL), Elisabet Tiselius (Stockholm University), and research assistant
International collaborators: Lori Whynot (Northeastern University), Christopher Tester (Heriot-Watt)

6) *How do deaf interpreters and deaf immigrants create intersubjectivity in sign language interpreted communication?*
7) *Which types of depiction can be identified in these encounters?*

This WP explores how depiction is used in meetings involving deaf immigrants and deaf sign language interpreters. According to Stone and Russell (2015) DIs employ a greater number of utterances using depiction than the non-deaf interpreters. We assume that depicting is central for creating *intersubjectivity* in communication where the participants and interpreters do not share a language. In this WP we will explore how depicting is used when creating intersubjectivity in an interpreted dialogue. The deaf interpreters and the deaf immigrants do not share culture, nor do they have a common sign language. Hence the interpreter must create a common ground for communication, using traits from international signs (Olsen et al., 2018). Depiction when creating intersubjectivity between a deaf interpreter and a deaf immigrant has not been previously described. The role of a deaf interpreter (DI) is often described as the role of a language or culture broker (McDermid, 2010). It does not suffice to know sign language and having a hearing loss to be a DI (Metzger et al., 2014, p. 9). Deaf Extralinguistic Knowledge (DELK) is a concept that can help explicate competencies DIs may possess (Gile, 2009).

DELK entails formative experiences of exposure to sign language through life-long interactions with deaf family members, deaf peers within the education system, and deaf people in the community. Furthermore, it takes early experiences of interpreting within the deaf community, personal experiences of discrimination, oppression, and what it is like not to have access to communication. Given the DELK competencies, the DIs are ascribed a special responsibility for ensuring the deaf clients' comprehension in a team of deaf and hearing interpreters.

Research is needed that examines the use of depicting in a variety of text types and settings. WP 4 is directly linked to WP 3, and will explore how deaf interpreters use depiction to create intersubjectivity when communicating with deaf immigrants and methods and analysis are also equivalent. Prior to the interviews in WP 3 the deaf interpreters will be asked to participate in WP 4. There are few DIs in Norway, so we can only expect to get 3 participants in this part of the project. To identify the use of depiction we will apply the framework of Conversation Analysis and use ELAN (Wittenburg et al., 2006) as an annotation tool. From the data we will explore the use of depicting in the negotiation between the deaf interpreter and the deaf immigrant following the approach used by Fenlon et al. (2014). focusing on depiction characteristics and frequency. Skaten and Urdal will take responsibility for research design and analysis, Trengereid-Olsen and the research assistant will be responsible for recruiting participants: female deaf immigrants and DIs. The research assistant will transcribe the data. Skaten, Urdal and Trengereid-Olsen will analyze the results, with Tiselius and international collaborators as consultants throughout the process.

WP5 DEPICTION IN DEAFBLIND INTERPRETING
Leader: Gro Hege Saltnes Urdal (HVL)
Core participants: Kjersti Skagen (HVL), Eli Raanes (NTNU), and research assistant
International collaborator: Johanna Mesch (Stockholm University)

8) *How do interpreters use depiction when interpreting for deafblind individuals?*

Depiction has been found in encounters between deafblind people using tactile sign (Mesch, 2018), and it is documented that they use different strategies when utilizing depiction compared to sighted signers. Deafblind signers place signs in different directions and distances, and in this process, they also use the other interlocutor's hand or body. These utterances are co-constructed and they "illustrate meaning construction during emerging, embodied discourse" (Mesch et al., 2015, p. 261). Recruiting the interactant's hand and producing a depicting blend, can be referred to as co-formed depicting signs. Both depictive and indexical behavior are strongly dependent on the intersubjective co-construction of shared meaning in tactile sign language, perhaps more than descriptive behaviors (Edwards, 2017). This emphasizes the necessity of examining language in interaction when attempting to explore depiction used between deafblind individuals. According to Dingemanse (2015, p. 950), "to interpret depictions, we imagine what it is like to see the thing depicted." This WP will also investigate how this is done when interpreting for deafblind individuals. As there is a lack of research investigating this topic, this WP will contribute knowledge useful for interpreters and interpreter educators, enhancing their metalinguistic competence (Pinto et al., 1999). It will also strengthen the interpreting profession by portraying the tasks of a deafblind interpreter and emphasizing the place of depicting when communicating with deafblind individuals.

By investigating the use of depiction with working interpreters we can explore the similarities and differences in use. This work package will gather data through method triangulation using recorded observations and individual interviews. Participants in WP 5 are deafblind individuals using tactile communication, interpreters, and a presenter. Data will consist of video recordings a 15 to 20 minutes long lecture being interpreted by three interpreters to three individuals with deafblindness using tactile sign language. Multiple cameras will be set up to capture both the individuals and interpreter's use of tactile sign language and to get a comprehensive view of the interpreted event (Orfanidou et al., 2015). The videos will be annotated using the multimodal annotation tool ELAN, focusing on where, how, and when depiction is used. A quantitative data analysis will be applied when registering the frequency in the use of depiction and to identify different motivating strategies. Urdal will be responsible for research design and data analysis, together with Raanes and Skagen in recruiting participants. The research assistant will transcribe the data and all the researchers will collaborate on analyzing results.

WP6 DIFFERENCES IN DEPICTING BETWEEN EXPERIENCED AND INEXPERIENCED SLI
Leader: Elisabet Tiselius (Stockholm University)
Core participants: Gro Hege Saltnes Urdal (HVL), Ingeborg Skaten (HVL), postdoc, research assistant
International collaborator: Christopher Stone (University of Bristol)

9) *Are there observable differences in the use of depiction between inexperience vs. experienced interpreters vs. deaf interpreters?*
10) *What are the characteristics of these differences if found?*

Experience is a strong factor in interpreting performance (Liu, 2009; Tiselius, 2013). Over time interpreters develop and refine interpreting strategies, which often cannot be fully internalized without experience despite being taught in interpreting programs. Furthermore, most interpreters also develop their linguistic competencies over time. This work package aims to investigate whether depiction is developed over time by active interpreters. Understanding if and how depictive strategies develop over time will inform interpreter training on how to teach depiction to future sign language interpreters. It will also contribute to understand the concept of depiction in terms of a communication tool.

We will explore depiction among very advanced L2 signers namely interpreters to specifically investigate development of depictive strategies with experience. Participants are three different groups of sign language interpreters. The first group are hearing students at the last year of the sign language program, the second group consists of hearing sign language interpreters with at least 10 years of interpreting experience, and the third group consist of deaf interpreters. As we are interested in the development of depiction in L2 speakers none of the hearing participants will be CODAs (Children of Deaf Adults), as they are L1 signers. Each group of hearing interpreters will consist of at least five participants. For the deaf interpreters we will aim for five (but we understand that this may be difficult considering the few numbers of deaf interpreters in Norway, cf. WP4). Hearing participants will interpret an enacted roleplay between a hearing and a deaf person. The deaf interpreters will interpret a roleplay between a hearing signer of NSL and a deaf signer of a foreign sign language. After task completion, all participants will engage in retrospection. The roleplay will be prepared to elicit different types of depiction. The roleplay will be recorded using two video cameras. Data both from the roleplay and from retrospection will be transcribed for analysis using ELAN to do multimodal coding. We will compare the performance of the three groups of interpreters to understand how depiction develops with experience for hearing L2 interpreters. We will also compare how the deaf participants use depiction compared to the hearing participants in this context. Tiselius will take responsibility for research design and analysis. Urdal and Skaten will be responsible for recruiting participants to the work package. A post-doc will also be recruited for the project. Data collection and data analysis will be done in collaboration between Tiselius, Urdal and Skaten, and the post-doc. Stone will help with developing the roleplay so that there are equal and comparable amounts of depictions across the different sign languages. The international collaborator will also help to recruiting the foreign language signer. Furthermore, the WP will also need a research assistant for data collection, transcription, and analysis.

1.3. Novelty and ambition
One of the most pervasive cultural metaphors for how we think about communication is the notion that "messages" are "passed" between language users. First a message is "packaged" into a linguistic form and conveyed through auditory or visual signals to another where it is "unpacked", and the intended meaning understood. Linguists generally recognize that this metaphor is neither sufficient nor heuristic in understanding how humans interact with each other as it recognizes only one *mode* of communication – the primarily arbitrary connections between form and meaning that must be learned when one knows a language. In face-to-face communication we use a wide and varied range of strategies that recruit our surroundings, our shared knowledge, and each other's creativity to arrive at a shared conceptualization (Wilcox & Shafer, 2005). Interlocutors do not decode messages; they build meaning together through the co-construction of multimodal communicative interactions. This multimodal approach to understanding communication recognizes three fundamental categories of connecting forms (sounds, facial expressions, body movements, etc.) to meanings. These are *description, indication,* and *depiction* (Ferrara & Hodge, 2018). Description and indication are generally more conventional, core aspects of the grammar of any language such as words, idioms, and anaphora where the form of the action is not related to its meaning. In spoken WEIRD (Western European Industrialized Rich and Democratic)

countries language's, descriptions are usually primarily vocal/auditory, and indications are often a mixture of vocal and gestural behaviors such as pronouns or pointing actions. In these cases, a small change in form result in new meanings. Depictions, on the other hand, rarely have purely conventional or arbitrary form/meaning connections. Instead, small changes in form result in analogical changes in meaning (but cf. Lepic and Occhino (2018) for how depictions can function more lexically as well). When interlocutors interpret each other's depictions they must draw on their previous experiences to visualize what is depicted (Dingemanse et al., 2015) In spoken language, a typical example of a depictive performance is when a speaker will imitate the tone, pitch and manner of speaking of another person, but can also extend to individual words such as onomatopoeia. Generally, depictions are more accessible to language users that do not share or only partially share a language with each other – as found in International Sign (Stone & Russell, 2016). This is because depictions recruit *iconic* (a motivated, non-arbitrary relation between form and meaning) representations of referents and actions that do not need to be learned prior to their use in each communicative context before they can be understood.

DEPICT's approach is novel in its scientific scope and societal ambition in that we start deep and trawl wide, rather than being forced to only scratch the surface of our research questions. Even though there is a growing academic interest in NSL (Erlenkamp, 2011; Ferrara & Halvorsen, 2017; Schrøder, 2011; Selvik, 2006; Vogt-Svendsen, 1981), comparative output is slim and researchers have needed to focus on isolated issues with little opportunity for broad claims. NSL is poorly understood compared to larger signed languages, and even in comparison to its Nordic neighbors such as Finnish, Swedish, and Danish sign languages. This lack of knowledge has undoubtably contributed to lack of opportunities for the Norwegian deaf community. By narrowing our focus to depiction, we can more comprehensively understand its behavior in a much wider sampling of the NSL language ecology, which allows us to both be more confident in our findings and more quickly tailor dissemination to the stakeholders who will benefit most from our findings.

2. Impact

2.1 Potential for academic impact of the research project

Depiction has not been investigated with the broad approach we take in the proposed project. We aim to investigate the use and occurrence of depiction from the perspective of deaf signers, deafblind signer, hearing and deaf sign language interpreters, deaf immigrants with limited knowledge of the majority sign language, as well as the use of depiction from sign language for hearing children. We will gain collaborative benefits from reference and research groups both within Norway, as well as abroad (cf. our collaborators). DEPICT has a blending of primary and applied research on depiction and our motivating hypothesis across our WP is that the distribution of descriptive, indicating, and depictive communicative behaviors in signed language communities is very different than the spoken language communities they co-inhabit. This distribution difference means that interpreted interactions between groups require extensive mediation at levels that have typically been referred to as linguistic, cultural, and situational. By focusing on depiction in a variety of settings we can cut through these overlapping and intersecting influences to reveal an underlying pattern and potentially even gain insight into the reason for these differences. This also means that WPs are developed so that they will have the potential to both inform and improve current practice in many daily situations (communication with refugees, communication in kindergartens, working conditions for deaf employees, teaching of future sign language interpreters) and also shed light on a communicative phenomenon which has hitherto not been the focus of research attention. The effect of increasing our understanding in these intersectional projects is exponential – each with benefit from the others informing current and future investigations.

2.2 Potential for societal impact of the research project

Expected societal impact and sustainable development goal *Quality Education* and to *Transform the world for persons with disabilities*. DEPICT aligns with the United Nations' Sustainable Development Goal 2: *Quality Education* and 17: *Transform the world for persons with disabilities*, to ensure inclusive and quality education for all. The Norwegian deaf and deafblind community are an integral part of Norwegian society and yet are excluded through the orally focused communication behavior of the majority society. Since we know that depiction is prevalent in both signed and spoken language its unique expression through deaf and deafblind people's competencies can shed light on

depiction use in spoken language as well with potentially wide-reaching societal benefits. Much like hearing football teams in the United States adopted deaf football teams strategy of the huddle to prevent "over-seeing" play-planning, there are likely to be surprising benefits for larger society from understanding a deaf-enriched language behavior like depiction (Bauman & Murray, 2014). By understanding depiction better, we can increase knowledge, both of spoken language and of signed language – allowing for research-based training of sign language interpreters and teaching of sign language. Better understanding of depiction will also strengthen pedagogy for other hearing learners of sign language, and for deaf learners of NSL (i.e. deaf immigrants to Norway).

 Expected societal impact and sustainable development goal *Good Health and Well-being* **and** *Gender Equality***:** By studying how deaf individuals use visual depiction to support communication, understanding and inclusion we also align with UN's Goal 3: *Good Health and Well-being*. We aim to explore this from a linguistic, cognitive, and sociological perspective. Speakers of languages from most Western and European countries lack intuitions about how to interpret and utilize depictive behaviors. Findings will contribute to improve the teaching of sign language as a second language and sign language interpreting. Findings will also contribute to better reception and evaluation of deaf asylum seekers, particularly women (cf. UN's Goal 5: *Gender Equality*). Understanding of depiction will contribute to a more accurate understanding of deaf immigrants' sign language, and thus contribute to fairness and security in encounters with deaf immigrants.

3. Dissemination

DEPICT will focus on the following user groups for dissemination of results and findings:

Deaf community and public impact (Level: **national & local | Type: societal | Project Stages: early, mid, late)**. DEPICT will produce opinion pieces once a semester and other texts such as blogposts aimed at the public throughout the project period communicated through the project website and press releases via HVL's communication department. At the end of the project, all publications will be translated and shared at a popular science level in Norwegian and NSL to inform general community members and members of the deaf community about our project through local and national congresses (e.g. Norges Døvesforbund, Nygård voksenopplering for døve innvandrere i Bergen, Ål folkehøgskole og kurssenter for døve, Skullerud voksenopplæring, Oslo, Bergen Døvesenter).

Scientific community impact (Level: international | Type: scientific | Project Stages: mid & late). DEPICT will produce high impact publications in top peer reviewed journals in the fields of Linguistics (e.g. *Language and Cognition, Cognitive Linguistics,* etc.), Deaf Studies (e.g. *The Journal of Deaf Studies and Deaf Education*, *Disability & Society*, etc.) and Interpreting (e.g. *Translation, Cognition & Behaviour*, *Interpreting*, *International Journal of Interpreter Education,* etc.). Presentations at national, and international conferences (one presentation per WP) will disseminate information about the project and its findings to a broad scientific audience. Additionally, collaborations will be initiated and maintained by means of review by external members of the advisory board, a planned methods seminar, a national workshop, and a final international conference at HVL.

 Education stakeholder impact (Level: **national & local | Type: societal | Project Stages: late).** DEPICT will approach interpreter organizations and government entities (e.g. *Tolkene i Akadmikerne NAV*) responsible for providing interpreting services with an aim to receive meetings and conference invitations to offer opportunities for Continuing Professional Development. Such contacts are difficult to plan, but several of the key participants are already quite visible and hold important public commissions of trust (cf. The CVs of Co-PI's Anible, and Urdal – former leader of the National Academic Council for Sign Language and Interpreting Studies, WP 4 coleader Skaten former board member of the Regional Interpreter Organization and member of the Deaf Organizations interpreter committee, WP 6 leader Tiselius member of the research committee of the International Association of Conference Interpreters).

4. Implementation

4.1. Project manager and project group

DEPICT will be hosted by the Western Norway University of Applied Sciences (HVL). As one of only three institutions in Norway that train NSL interpreters and its excellent ties to the interpreting field, it is an ideal host for the project.

Co-PI Anible is an Associate Professor of Sign Language and Interpreting at HVL and a member of the research group *Sign Language, Interpreting and Communication* (SLIC). His research on NSL started with his national collaboration with the Research Counsel of Norway (RCN) funded early career researcher grant awarded to Lindsay Ferrara, *Language use in the Norwegian Deaf community: reflections of a signed language ecology* (287067) which is a project building a corpus of NSL and investigating the systematic and constantly evolving communication practices within various Norwegian Sign Language interactions. He has led and participated in research related to WP 1 (Anible, 2020; Occhino et al., 2017, 2020), and works with issues related to the other WPs in his training of NSL interpreters.

Co-PI Urdal is also an Associate Professor of Sign Language and Interpreting at HVL and a member of the SLIC research group. She has conducted research on interpreter students' development of professional characteristics as interpreters for deafblind individuals (Urdal 2017; 2019), and participated in research on educating deaf interpreters (Skaten, Urdal & Tiselius, in press) as well as deaf interpreters and the market (Urdal & Skaten, in progress). Her research is related to WP 4 and 5. In addition, she has participated in the project 'Communication on your own terms (Milla Says)' a project funded by the Regional Research Fund Vestland (297049).

All WP leaders are active researchers in the SLIC group and WP leaders 1-5 are currently employed at HVL. Tiselius (WP6) is an associate professor of Translation Studies with a focus on interpreting at Stockholm University. She is an affiliated researcher with the SLIC research group at HVL. In Stockholm, Tiselius is affiliated to the research group on Childhood Cancer Healthcare Research at the Karolinska Institute where she investigates communication over language barriers in highly specialized pediatric care. She is the leader of the SPRINT research group at the Institute for Interpreting and Translation Stockholm University which focuses on processes in translation and interpreting. Torbjørnsen (WP2) is also a member of the *Language and Society* (LS) and Urdal (WP4 and WP5) is a member of the *Technology, Health and Society,* research groups at HVL.

The SLIC group will be significantly strengthened through the project with two PhD positions, one funded through the project and the other through HVL. Candidates for WP1 will be sought internationally and ideally recruit someone with competencies in psycholinguistics and signed languages. Candidates for the PhD position in WP3 will primarily be sought nationally as it requires knowledge of Norwegian and NSL. The postdoc for the WP6 will be sought internationally and ideally be someone with a background on process research in sign language interpreting.

As is evident from the description of the work packages in section 1.2 there will be both national and international collaborators in DEPICT, associated with specific WPs and who will contribute up to 10% of their research time to the project as project partners or be hired as R&D procurement for up to 50 hours per year. The competence of the DEPICT project team includes linguistic expertise (Anible, Tiselius), translation theory (Skaten, Urdal, Trengereid-Olsen, Tiselius), and sociology (Trengereid-Olsen, Torbjørnsen, Skaten). Given these competencies, they are uniquely qualified to address the research questions of this project.

The Scientific Advisory board will consist of internationally recognized researchers from relevant specializations: Cecilie Hamnes-Karlsen (professor in linguistics with a focus on multilingualism and contrastive linguistics, HVL), Pamela Perniss (professor in Linguistics with a focus on space and iconicity, University of Cologne), Ingela Holmström (associate professor in Sign Language with a focus on inclusion and deaf immigrants, Stockholm University), Graham Turner, (professor in Translation and Interpretation with a focus on Deaf Studies at Heriot-Watt University).

The Community Advisory board will consist of authoritative representatives from the deaf and sign language community: Arnfinn Vonen (Professor in linguistics with a focus on special pedagogics Oslo Met university); Sonja Myren Holte (consultant at the Norwegian Language Council with a special focus on NSL); Petter Nordeland (General Secretary of the Norwegian Deaf Association).

4.2. Project organization and management
DEPICT will meet its objectives through WPs carried out along the timeline shown in Figure 1.
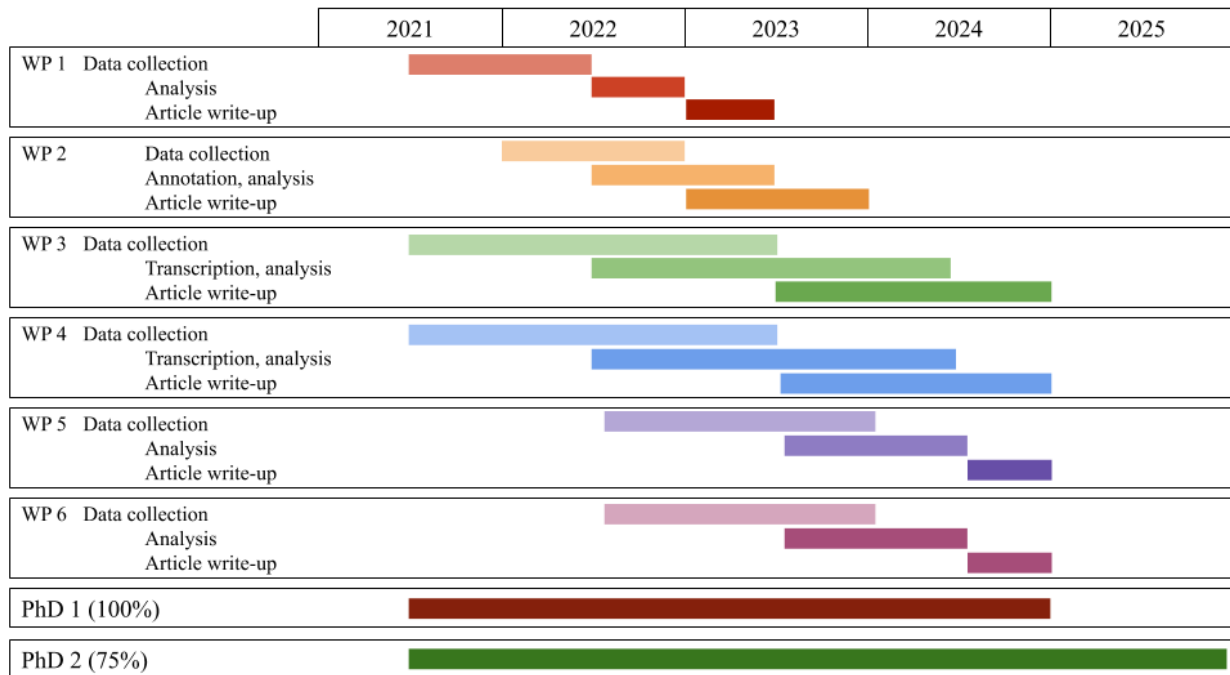
Figure 1. Gantt chart timeline for proposed project divided into Work Packages and important milestones.

4.3. Data management plan

Issues with data collection, consent and storage for each work project are shown in Table 2:

Table 2. Summary of participants, data collected, and consent needed for DEPICT WPs.

	Collection	Video storage	Consent
WP1	~60 deaf & hearing adults	Short term	Norwegian and Russian
WP 2	~20 children	Short term	Norwegian, Parental permission
WP 3,4	~7 deaf adults	Permanent	Norwegian, International Sign, or legal guardian permission
WP 5	3 deafblind individuals 3 hearing sign language interpreters	Long term Short term	NSL, Norwegian
WP 6	5 DIs, 5 hearing SLI, 5 SLI students	Short term	NSL, Norwegian

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