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English Mouthings in International Sign Language

To what extent are English mouthings present in international sign language?

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Abstract

There is a lot of variety between the different sign languages across the world, but somehow sign language users are able to communicate without a shared language. International sign (IS) is a form of improvised language that occurs through mediation between two or more signers from different backgrounds. Research has shown that international sign is a useful form of communication in international situations, but it is still unclear what the parameters of this concept are and how it works. This research tries to scratch the surface of the intricacies of international sign, by looking at the mouthings of a Dutch NGT user in two conversations with Chinese sign language users. These conversations were recorded at a point where either signer was completely unknown to their conversational partner and their language backgrounds had close to no overlap. The aim of this research was to see whether or not and to what extent the spoken English language occurred in the mouthings of international sign. The results are that English was indeed the main language used by the NGT signer in her mouthings (over 70 % of all mouthings), but the use of mouthings (English or otherwise) decreased throughout the conversations, which might indicate that the signer realised mouthings would not be useful in negotiating meaning in this particular situation. This may provide more insight into the way sign language users are able to interfere which aspects of international sign aid understanding in a particular context and which do not.

Keywords: Sign Language, International Sign, Mouthings, English

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Introduction

This thesis has looked into the use of spoken English in the mouthings of international sign. International sign (IS) is a term used for a form of contact language which comes about when two or more deaf sign language users with varying language background attempt to communicate without a shared language or an interpreter. This happens through various forms of improvisation and feedback-based structures of attempting to communicate or 'make meaning'. It could be seen as a form of pidginization which happens very quickly and in many varying forms depending on the context and the communicators' backgrounds. In order to understand research into international sign and sign language in general it is important to note that there are many different sign languages, which are, just like spoken languages, completely different and very complex. Sign language users can communicate with the same intricacies and grasp of abstract concepts as hearing speakers do and sign languages perform just as well as spoken languages do on a linguistic level. One very interesting exception to the similarities between spoken and signed languages is the possibility of international sign, because it opens the possibility for international communication without a shared language, which is something that would seem impossible in auditive communication. The intricacies of international sign have been researched to some extent, but many aspects of international sign are yet to be looked into. While most research has focussed on international sign in more formal settings, such as conferences or talks where an international sign interpreter is present, this research will focus on an informal setting where international sign is the only means of communication. Even though the amount of data was limited, an attempt has been made to look into the use of mouthings in international sign. Mouthings are inaudible spoken words that are an integral part of most sign languages. They have not yet been researched in the context of international sign. In this research the focus will be on the use of English in these mouthings, since it is expected that English would be the main language of choice in an international setting. The mouthings had to be annotated in the data, which was done by the researcher. This data came from a project on cross-signing for which videos were made of three participants in one-on-one conversations. These participants did not have any common ground in their language backgrounds and had not previously met, making this data a reliable instance of international sign in action. With this data and the annotations made during the process of this research an attempt was made to answer to what extent the English language plays a role in the mouthings of international sign. It was found that English was definitely the go-to language for mouthings in this particular set of data. Even though this was only

confirmed for one participant, a Dutch NGT user who had knowledge of the English language, it is still a start for research into English in international sign. Looking into this topic was an interesting and difficult process that will hopefully inspire further research into the mouthings used in international sign.

Literature Review

In the Deaf community sign languages are almost always the main form of communication. While most deaf individuals do learn spoken languages to some extent, especially with the rise in use of cochlear implants and other hearing aids, sign language will always be a more fully developed language experience, whereas spoken language will always remain difficult (Marschark, Tang & Knoors, 2014). Sign languages are used by deaf and hard of hearing people to communicate with the same intricacies that hearing people do with spoken languages. Just like spoken languages, sign languages have a morphology, grammar, syntax, phonology and any other linguistic aspects of a language one might think of. Sign languages are produced with hand movements, arm movements, facial expressions and mouth actions. All sign languages share these aspects and are complex systems of communication which can be used to communicate any type of topics in any form of context where sign language users are present (Marschark et. al., 2014).

Sign languages have been the topic of research for many years. It has now become undoubtedly clear that they perform the same way linguistically as spoken or written languages do. Focus of sign language research has for a long time been on the similarities between signed and spoken languages in order to ‘prove’ that signed languages are real and established languages in the same way as spoken languages are. This was important for sign languages and their users to gain the recognition needed in many situations. It is important to note that, just like with spoken languages, there are many different sign languages, which have mostly developed naturally within a Deaf school community alongside a spoken language. Most regions that have their own spoken language also have their own sign language and, like with spoken languages, there are even regional variations and dialects within signed languages. Sign language users are almost always bilingual, having knowledge of at least their sign language and the spoken language of the region they are in. This type of bilingualism is referred to as bimodal bilingualism and, unlike bilingualism with just spoken languages, it is still rather unclear how and to what extent the language influence each other

or what the implications on language use and development are (Marschark et. al., 2014). Bimodal bilingualism is a very interesting type of bilingualism, since it consists of (at least) two languages which are produced in a completely different way. It would even be possible to activate and use knowledge of a signed and spoken language at the same time, so bimodal bilingualism is a very interesting topic for research. There are many topics concerning sign language which are still in need of more research. Sign language in general has only been a topic of research for a little over fifty years now. With writings by researchers such as William Stokoe, who did extensive research into the grammar and notation of American Sign Language (ASL), at the forefront of exploring the linguistics of sign languages. Since then, research has shown the similarities between signed and spoken languages on many different fronts from phonology, to morphology, syntax and many others. It has been proven that sign languages are complex and fully developed language systems which are a very interesting topic of linguistic research for many reasons (Hiddinga & Crasborn, 2011).

Research has mostly focussed on the similarities between signed and spoken languages, for understandable reasons of course, but there are also many noteworthy differences between the two. One of which is the way sign language users can often communicate with each other without a shared (signed or spoken) language. It has often been noted anecdotally that deaf sign language users can establish communication with users of a different sign language without sharing a language, signed or otherwise, as common ground. This is a phenomenon that only occurs in sign languages. Most hearing people would be lost in a foreign situation with no mutual language, but sign language users can communicate in these situations using international sign. Even though this is common knowledge in the field of sign language research and there has been some research into explaining this phenomenon, further research is very much required. The ‘language’ or means of communication that is formed when two users of a different sign language communicate is often referred to as ‘International Sign’, another term that is sometimes used is cross-sign and other terms have of course been used previously. International sign (commonly abbreviated as IS) can be defined as “a form of contact signing used in international settings where people who are deaf attempt to communicate with others who do not share the same conventional, native signed language (NSL)” (Whynot, 2016). This form of language contact which leads to an improvised language strategy has been described in many terms, of which International Sign now seems to be the main one used in most instances of research. This term was coined in the 1990s and has since then appeared in a large amount of sign language literature. International Sign is not

a community sign language with native users, such as older and more established sign language like for example NGT (Dutch Sign Language), BSL (British Sign Language) or ASL (American Sign Language). It does not have native speakers and it has no set vocabulary or grammar. It has also not yet been taught in formal settings. Aside from the fact that it is not a formal language with formal instruction or native speakers, it has been proven that a lot of Deaf people use IS in many different contexts. It is still rather unclear what the intricacies of this form of contact language are even though there have a number of studies into international sign (Whynot, 2016). Research has looked into the understanding of IS among sign language users to see to what extent it is actually understood (Whynot, 2016). Unfortunately this research has solely focussed on formal settings, such as sign language conferences, with trained IS translators, and does not show any information on IS in informal settings, but it does show to what extent IS has already become an established form of communication in international Deaf contexts. Research on international sign has been scarce, with only a few published papers and one thesis existing in 2016, but it is steadily growing (Whynot, 2016). So far research has shown that this means of communication between signers of different language backgrounds who lack a common language is very different from the way this happens with spoken languages (Hiddinga & Crasborn, 2011). Hiddinga & Crasborn showed that this form of communication is highly dependent on context and extremely varied, making it an integral part of how sign language users, or visual communicators, are inherently different from spoken language users or auditive communicators (Hiddinga & Crasborn, 2011). Most research pertaining to international sign has focussed on international sign in formal contexts, such as conferences where the main language is international sign or talks where an international sign interpreter is present (Whynot, 2016). Right now international sign is almost always the main language used in international conferences relating to sign language, often alongside the main sign language of the region the conference is held in. Many people use international sign to communicate in these settings and the more informal settings surrounding them. Most speeches and presentations are held in or translated to international sign, so viewers from any region can understand the research that is discussed (Whynot, 2016). Most research surrounding IS in these events has focussed on the type of international sign that is used by these professional translators (and some on whether or not and to what extent this is understood by the viewers). An interesting example of this is the research on iconicity in international sign by Rosenstock in 2008. This research showed that the way sign languages are translated to international sign by interpreters is highly iconic, which means that the meaning of the sign can be directly connected to the way the sign looks

(Rosenstock, 2008). Unfortunately this research has again only focussed on IS in formal settings and not the more natural setting where sign language users meet and try to informally communicate without a shared language. The type of international sign translators use is rather formalised and much more consistent than the international sign that occurs in a setting with a small number of sign language users who are simply trying to establish communication instead of translating pre-existing speeches for a larger audience. The type of international sign which occurs in smaller setting has unfortunately not been a topic of research that often. However, there has also been some research into the way in which people understand each other in international sign in smaller settings (Zeshan, 2015). This research by Zeshan in 2015 focussed on the way meaning (or mutual understanding) was made between people one might assume would not be able to understand each other, due to a lack of common ground in their language backgrounds. The focus was on how mutual understanding can be created purely from context and interpretation, through the use of international sign. The results showed that international sign can be viewed as a usage-based model of language. Since there is no common language background, communication has to be built from the ground up. This is done by negotiating meaning of various signs or other morphemes, where the sign language users decide on certain meanings for that context and that conversation only and continue to remember and use these decisions throughout the conversation. This form of creating understanding is highly based on feedback from the communicators. Attempts at communicating something are made and a topic will be discussed until both speakers feel that a form of mutual understanding has been established. When a misunderstanding or a situation where an attempt at communicating something is made but not understood occurs, many strategies to make oneself clear are deployed, until one is found that works or the conversation moves to a different topic. The research has also confirmed the influence of multimodal bilingualism. The sign language users create a space for language that comes from all of their known languages, signed and spoken. "The signers simultaneously and continuously need to resolve a whole range of communicative challenges, for which some evidence from the post-hoc introspective interviews has been discussed above: deciding which linguistic items, structures, and other communicative strategies to use; making best guesses about the intended meaning of the interlocutors' signed output; monitoring and interpreting the interlocutor's non-verbal responses such as non-manual back-channel responses; and keeping track of those signs and structures that have entered the shared repertoire they have with a particular interlocutor at a given point in time." (Zeshan, 2015). So, in other words, it is a language formed through extensive cooperation and feedback in all

types of communication that the communicators have at their disposal at the time of communicating.

Even though research on international sign is steadily growing there are still many topics surrounding it that are yet to be explored. One of these topics is the morphology and grammar of international sign. It is still unclear where the building blocks that form international sign come from and whether or not there is a consistent grammar that is used in all instances of international sign, regardless of the language backgrounds of the communicators. An example of research like this could be the use of mouth actions in international sign. Mouth actions is a term used to refer to anything the mouth does when signing. The use of mouth actions, and specifically mouthings, which are spoken language elements which can be seen as the result of language contact within one country, could show some similarities or differences between established sign languages and international sign. Since mouthings are spoken language elements within sign language, they could show the influence of spoken language knowledge when trying to establish communication without a shared language. Research on mouthings in established sign languages has resulted in many insights regarding language contact and bimodal bilingualism in sign language users, so its potential for showing these insights in international sign contexts as well is high.

Mouth actions is an umbrella term for anything the mouth does in sign language and can be divided into many categories. One of these categories is called mouthings, these are mouth actions which originate from spoken language. Mouth actions that stem from sign languages and cannot be related to spoken words are often referred to as mouth gestures and are mostly comparable to manual gestures in spoken language (Ebbinghaus & Hessman, 2001). This research will focus on mouthings, which are inaudible expressions of words that usually come from the spoken language that is used in the same region as the sign language. For Dutch sign language (Nederlandse Gebarentaal or NGT) for example, these mouthings come from spoken Dutch. In BSL and ASL the mouthings stem from spoken English. Even though mouthings can easily be linked to a spoken language this does not mean the mouthings compile to full sentences that would be understood by someone who could, for example, lipread very well but not understand the sign language the mouthings are a part of. They are really just a supporting morpheme that comes with most signs (but not all) in the grammar of that sign language. In NGT, for example, they often coincide with nouns and hardly ever coincide with pronouns. Mouthings have been a topic of discussion for many years, since at first it was unclear whether or not they are part of the sign language or a form of transfer from

spoken language, but the consensus has since become that they are a vital aspect of sign language used to differentiate between signs which are minimal pairs. There are many instances of signs which are exactly the same in all aspects of movement except for the mouthing. When interpreting these signs the mouthings are vital in differentiating what exact word is meant. In 2016, Bank, Crasborn and Van Hout have looked at the prominence of spoken language elements in sign language. They found that the mouth is very active in NGT and that around 80% of the mouth actions are mouthings, whereas only 20% are unrelated to the spoken language of the area (Dutch) and are therefore classified as mouth gestures or 'other' mouth actions. Since bimodal bilingualism creates a unique situation in which there are no physical restrictions that dictate the use of both languages at the same time, sign language users are a very interesting topic when it comes to code-blending. The combination of spoken and sign language elements is prominent in most, if not all, sign languages (Boyes Braem et al, 2001). NGT is no exception to this rule. It has been shown that the mouth in NGT is generally just as active as the hands while signing (Bank, Crasborn & Van Hout, 2016). So, mouth actions are definitely a prominent aspect of sign languages. In their data, which came from the Corpus NGT, around 80% of mouth actions were categorised as mouthings. These spoken language elements are therefore definitely not a trivial category and might be able to show a great deal of information regarding specific sign languages, sign languages in general and the contact with spoken languages. Research on mouthings in NGT has mostly been done through the corpus NGT, which is a corpus that is compiled of a large number of videos of Dutch sign language in many different contexts. This corpus has proved to be extremely useful for research into NGT, with its mouthings being no exception.

Mouthings can be used to gain insight into the language contact between signed and spoken languages, since they show that sign language users have some form of knowledge of the spoken language. Research into mouthings can therefore show a great deal of interesting conclusions in regards to language contact and bimodal bilingualism. Until now, mouthings have not yet been a topic of research when it comes to international sign, even though they might be able to show to what extent which languages are used when communicating with people who have no common language in their repertoire. This research intends to show that the mouthings used in context of international sign can show a great deal of information. The hypothesis is that mouthings in IS will often come from spoken English, since that is still the main language hearing people turn to in international settings and most Deaf people are expected to have had contact with spoken English, ASL or BSL to some degree.

According to the book *English, One Tongue, Many Voices* the English language has approximately 1.5 billion speakers globally (Svartvik & Leech, 2006). It is of course difficult to define what a world language is, but if there is one, English would be a good contender. With this massive amount of first and second language speakers and the rise of international media it is safe to assume some knowledge of English has reached sign language users as well. For the Netherlands this is easier to determine, since everyone has to complete their standardised exams for English reading in high schools and this goes for hearing as well as deaf people. In other countries where education and the use of global media is not as standardised this might be more difficult, but for this research it has been decided to assume that the English language is one that will likely have reached the largest amount of influence in an international setting compared to other languages. This is why the research on mouthings in international sign will for now focus mainly on whether or not, and to what extent, the mouthings come from the English language. Another reason for this is the growing knowledge of ASL (the standardised American Sign Language) in the Deaf community through the sources such as YouTube and other global online platforms used for international visual communication. Many sign language users have gained knowledge of ASL through the growing use of online media and with ASL come English mouthings. It is expected that this research will show a fair amount of English mouthings in international sign. This hypothesis is based on the research by Svartvik & Leech on English being a world language. Since English is the main spoken language used in international setting it will likely also be the spoken language that people in situations of international sign tend to choose. Especially when a common spoken language is lacking.

Based on previous research into mouthings it is expected that mouthings will definitely be present in the data. Mouthings have been shown to be an integral part of most sign languages and are in some context even vital to the understanding of or differentiating between some signs. Since there is a lack of a common spoken language these mouthings are expected to come from the English language, but it might be possible that the use of mouthings will alter or even decline when one or both of the communicators realises that spoken language does not add anything to the attempt to understand each other or 'make meaning'. Zeshan's research has shown that the language developed over a period of using international sign in an informal setting is highly based on the input and feedback of understanding from the signers, so when it becomes clear that the mouthings, English or otherwise, do not add anything to this understanding it could be expected that the use of mouthings will change. These changes could form in many ways. It might be possible that the

chosen language for the mouthings will alter in an attempt to find some form of common ground. Another possibility is that the use of mouthing will decline altogether. It will be interesting to see the way in which mouthings behave in international sign and the implications this might have for further research into bimodal bilingualism in international settings.

This research might also show to what extent international sign is actually useful in creating understanding between signers who lack a common language. Research has recently been referring to the term Deaf gain, which in simple terms means the (linguistic and cultural) gain people who are deaf and use sign language have over people who are hearing and do not use sign language. A part of this could be the possibility of international sign, which has never been shown to be an option in regards to hearing speakers. The option of using international sign in international settings with no common languages among communicators might prove to be very interesting and useful for further language research and is something auditive communicators have so far only been able to dream of.

Method

Data

For this research data was used which consisted of two video's recorded by prof. dr. O. Crasborn in Shanghai. These videos were recorded at the university of Shanghai and the aim was to use them for research into international sign. They have so far been partially annotated with some glosses and translations in parts of the first video and more general annotations throughout both videos. In order to have the data be the most true form of international sign as possible the videos were recorded within minutes of the participants' first meeting at the university of Shanghai. The Dutch participant had previously spent two days as a tourist in Shanghai, where she might have picked up some Chinese, Chine sign language, or Shanghainese, but that was the only possible instance of language contact there had been before the recording started. Other than that there was little to no overlap in the signers' language backgrounds. Because of this, it is a reliable source of international sign data recorded in an informal and small setting. The annotations that have since been made for these videos have focussed on finding out the topic of conversations and showing the amount of turn-taking and moments of misunderstanding between the participants. The points of misunderstanding were annotated by recording the 'repair signs' used to solve this misunderstanding or miscommunication. These repair signs have thus far been quite intuitively annotated.

The first video that was recorded was a conversation between the female Dutch NGT user (participant 1) and a female Chinese sign language user (participant 2). It consists of 42 minutes of free conversation with the only aim being to see where the conversations would and could go. The only instructions that were given in advance were to talk about their language and family background. For this video, which will from now on be referred to as video 1, the first five minutes had previously been translated and glossed (meaning the signs were specifically annotated in the order they were produced in, whereas translated means a more free way of annotating where full, English, sentences are formed). The rest of the annotations only consist of empty annotations that show which signer is signing at what time, so the turn-taking, the repair signs and questions, and some comments by the Dutch NGT user, who is a researcher at the Radboud university.

The video that was recorded after the first one is 30 minutes long and consists of a conversation between the same Dutch NGT user and a male Chinese sign language user (participant 3). This video barely had any annotations when this research started and has been used a lot less because of this, since it was very difficult to infer the meaning of the conversations. It was later decided to only look at the first video when annotating the data, because the second video lacked the mouthings that were the focus of this research.

Corpus NGT

In order to make any statements about the use of mouthings in the data from these videos, they were compared to data on mouthings from the Corpus NGT. Since this corpus has already been used for a lot of research, data from the Corpus NGT was not collected manually, but instead the data of this research was compared to results from a previous article by Bank, R., Crasborn, O. & van Hout, R. written in 2016. This article is called *The Prominence of Spoken Language Elements in a Sign Language*. The main aspects of this data which were focussed on are the amount of mouthings that are normally used by dutch NGT users compared to the amount of mouth actions. At first it seemed like a interesting idea to also look at the number of mouthings compared to the number of signs in the international sign data, but since the annotations for the signs were very limited at the time of collecting the data, this turned out to be impossible due to constraints in time and knowledge of international sign and NGT.

Participants

The participants will remain anonymous through the course of this thesis and will be referred to as participant 1, 2 and 3 throughout. Unfortunately there is no recorded information on the language backgrounds of participants 2 and 3. In order to still be able to say something about their language backgrounds some statements and inferences from prof. dr. O. Crasborn, who is the researcher who was present when the videos were recorded, were used to compile a relatively minimal language background for participant 2 and 3.

Participant 1: A deaf female Dutch NGT user who is between thirty and forty years old. She learnt NGT at a young age and also understands and speaks English. Her understanding of Chinese sign language was non-existent before the recording of the data, except for what was picked up in the few days of travelling through Shanghai.

Participant 2: A deaf female Chinese sign language user who is between forty and sixty years old. She has presumably used sign language her whole life and most likely has a very minimal knowledge of English, if any. She had never come into contact with Dutch or Dutch sign language (NGT) before the videos were recorded.

Participant 3: A deaf male Chinese sign language user who is between forty and sixty years old. He has presumably used sign language his whole life and most likely has a very minimal knowledge of English, if any. He had never come into contact with Dutch or Dutch sign language (NGT) before the data was recorded.

Annotations

For this research mouthing annotations were made for participant 1 in the entire first video, which was 42 minutes long. These annotations were made in ELAN, which is a programme developed by the Max Planck Institute in Nijmegen. There are guidelines for the way these annotations should be made and interpreted, which were written by prof. dr. O. Crasborn. These guidelines explain the types of tiers that are present in the data so far and what has been done with these tiers. So far there are tiers for glosses (literal annotations of the signs used), translations (the signs translated to written language), repair signs (for now, a very intuitive description of how repair, which is the way a misunderstanding is resolved, was

done) and questions (what type of question was asked). For this research a ‘Mouth’ tier has been added for annotating the mouth actions as well as a ‘MouthType’ tier which shows the type of mouth action. The words used in the mouthings were annotated on the ‘Mouth’ tier. On this tier the other mouth actions were recorded as empty annotations.

Mouthings were defined as any instance of spoken language which co-occurs with a sign or stands on its own, whether this was in English, Dutch or another language. So, in short, all spoken language elements in the data. The mouthings were annotated on the ‘Mouth’ tier with the full word capitalised. In some cases it was clear that a mouthing was produced, but unclear what the word could be, for these instances a question mark was annotated in order to avoid confusion with the empty annotations for mouth actions on the same tier. On the tier below, the type of mouth action was indicated with an M for mouthing. This was done in order to later on compare the amount of mouthings to the amount of other types of mouth actions.

Due to of the lack of annotations, especially glosses and translations, and time restrictions, the decision was made to not try to annotate the mouthings in the second video, which was the conversation with participant 2. An attempt was made, but this showed very few mouthings and great difficulty in inferring the words used in these mouthings without any context. Video 1 also showed a steep decline in mouthings throughout the conversation and, alongside a comment made by participant 1, this was enough reason to decide that the mouthings in video 2 were not only difficult to infer, but also hardly present.

After noting the amount of mouthings in the first video it was decided that it would be beneficial to the study to also take other types of mouth actions into account for a comparison. These mouth actions were annotated for participant 1 in the first five minutes of video 1. The types of mouth actions that were differentiated were:

M – mouthings

E – mouth actions that co-occur with and are part of a sign

A – mouth actions that do not co-occur with a sign

4 – mouth actions that are used to describe something to do with the mouth (such as eating)

W – mouth actions that are part of an expression in the entire face

The number of mouthings in the context of the number of mouth actions was later on compared to data from the Corpus NGT in order to make useful statements about these numbers.

Results and Analysis

When starting this research the background information of the data was unclear. Since it was unknown to the annotator which of the two videos was recorded first, the video with participant 1 (the female Dutch NGT user) and 3 (the male Chinese sign language user) was looked at first. It soon became clear that participant 1, the participant with an NGT/Dutch/English language background, hardly used any mouthings in this video, so it was decided to first look at the other video. Later on it was found that the video with participant 1 and participant 2 (the female Chinese sign language user) was recorded before the video with participant 3. It also soon became very clear that it was impossible to annotate the mouthings for participants 2 and 3, because the mouthings they used could not be linked to any of the languages the annotator understood and were therefore impossible to separate from other types of mouth actions. Because of this, it was decided to spend as much time as possible on the mouthings used by participant 1 and turn this research into a singular case study. A comment made at the end of the annotations by participant 1 said: “in general [participant 1] sees [participant 1] use a lot of English mouthings, not yet really, really realising that is useless in contact with [participant 2]. Records a few days later with [participant 3] in Suzhou garden. You might see [participant 1] uses lesser English mouthings after experienced contact with Shanghai deaf people over a couple of days.” (names are changed to participant numbers for privacy). Because of this it was decided that it would only be relevant to look at the first video, which contained a much larger number of mouthings. This comment also inspired the idea that this data might be able to show when the decline in mouthings started and how fast this decline happened. This was something that was focussed on when reviewing the annotations once they were finished.

Mouthings in video 1

Video 1 consisted of a conversation between both female participants and was the first recorded video. In the 42 minutes of video from the conversation between participant 1 and participant 2, 124 mouthings were found in the utterances by participant 1. This comes to an average of nearly three mouthings per minute. 82 of these 124 mouthings were clearly spoken English mouthings, whereas only 10 clearly came from Dutch. 32 of the 124 mouthings were unclear, under this category fall mouthings which could have come from either Dutch or English and mouthings which were clearly a mouthing, but of which the precise word could

not be determined. The impossibility to infer the exact words used in these unclear mouthings was mainly due to the hands covering the mouth in the video during a part of these mouthings or due to a lack of context which made determining the precise word very difficult. The lack of experience the annotator had with annotating mouthings, or sign language in general, also played a role in this issue. An example of a mouthing which could have come from English or Dutch is the mouthing which often came with the sign for family. The mouthings could have been the English word ‘family’ or the Dutch equivalent to this word ‘familie’, which look the same when lipreading. Unfortunately this difference was impossible to infer from just lipreading, and there was of course no sound, which is why mouthings such as these were not counted as either language, but as mouthings which were unclear. It is also important to note here that the annotator was neither deaf nor a native sign language user, which caused a severe lack of information regarding the signs which were used and, because of this, the context in which the mouthings were formed. For the parts that were not yet translated or glossed, this resulted in a difficulty regarding a lack of context.

Mouthings total	124
English mouthings	87
Dutch mouthings	10
Unclear mouthings	27

Table 1: The number and type of mouthings by participant 1 in video 1.

From simply looking through the data it immediately stood out that the number of mouthings, English or otherwise, declined through the course of the conversation. This was mostly noted because of the comment made by participant 1, who has reviewed and annotated parts of this data. She mentioned that her use of English declined over the course of her stay in Shanghai, due to the lack of understanding she noticed in the people she communicated with. Another reason this decline was noticed was that the annotating process altered to mostly reviewing video to see when mouthings would be used again, whereas for the first part the video had to be stopped much more frequently to review and annotate mouthings. Because of this observation it was decided to split the data into four 10 or 11 minute segments and show the number of mouthings for each part in table 2. In order to keep the parts more equal, part 1 and 4 one minute longer than the others, because they included the start and end of the video in which hardly any conversation happened, so this division seemed more reliable than dividing the 42 minutes into equal parts. The first and last minute of the video contained far

less signing activity and hardly any mouthings, because they mostly consisted of an introduction at the start and thanking and greeting the participants at the end.

Part 1	11 minutes	56 mouthings	5.09 mouthings per minute
Part 2	10 minutes	25 mouthings	2.50 mouthings per minute
Part 3	10 minutes	32 mouthings	3.20 mouthings per minute
Part 4	11 minutes	11 mouthings	1 mouthing per minute

Table 2: Mouthings per minute for each approximately 10 minute segment.

As shown in table 2 the amount of mouthings per minute in the first segment (part 1) is vastly different from the number of mouthings in later parts of the conversation. With a clear difference shown between the first and last part. This increase of over four mouthings per minute shows that the amount of mouthings used definitely decreased through the course of the data, which might show that the participant had reason to use English or mouthings in general less due to the signs she picked up while trying to create understanding. There is a slight increase in mouthings between part 2 and 3, but this might be explained through the topic of conversation in part 3. It became clear that the mouthings used were often the same words combined with the same signs. A very prominent example of this was the sign for ‘Deaf’ alongside the English word ‘deaf’. This mouthing made up over twenty-five percent of all English mouthings, which seems like quite a lot, since the rest of the English mouthings were far more varied. None of the other words were recorded over ten times through the course of the 42 minute video. Because of this observation the number of times the mouthing DEAF has been recorded was noted in table 2, alongside the total number of mouthings and the total number of English mouthings. Unfortunately the glosses and annotations were too incomplete to show how often these mouthings coincided with signs of the same meaning, but this does show the extensive use of this particular word alongside the total number of mouthings. In part 3 the conversation focussed more on deafness and deaf people, so this might be why the number of mouthings increased slightly between part 2 and 3, even though the number of mouthings overall decreased.

Mouthings total	156
English mouthings total	87
Mouthing DEAF	28

Table 3: The use of DEAF as a mouthing alongside the total number of (English) mouthings

Mouthings in video 2

Since there were hardly any mouthings found when closely investigating the first five minutes of video 2 it was decided not spend time annotating this video and focus on video 1, which did contain a lot of mouthings and also had more annotations on other tiers. The comment made by participant 1 also showed that she noticed a decline in her use of English over the course of her stay in China. When looking at video 1 it already became apparent that the use of mouthings vastly declined over the course of the first conversation, which, alongside the lack of annotations on other tiers, became a reason for not looking closely into video 2 and focus all available time of the video which did contain mouthings.

Mouth Actions

In order to draw more interesting conclusions from the data it was decided to also annotate a part of the first video for mouth actions other than mouthings. These mouth gestures were only recorded for the first five minutes of video 1 due to time constraints.

Mouth actions can be divided into the following categories::

M – mouthings

E – mouth actions that co-occur with and are part of a sign

A – mouth actions that do not co-occur with a sign

4 – mouth actions that are used to describe something to do with the mouth (such as eating)

W – mouth actions that are part of an expression in the entire face

The category of mouth actions which was found the most was E, with 16 occurrences in the five minutes which were annotated. There were hardly any instances of 4 noted, with only two of them in the five minutes which were annotated for mouth actions, but this is not uncommon, since 4 is only used when in context where the mouth is the topic of conversation, which does not happen very often. The type A was not noted at all, but a reason for this could

be that the annotator had difficulty with differentiating hand movements that were simply movements from actual sign, due to a lack of knowledge on sign language. In that case some of the mouth actions that were annotated as E should have actually been annotated as A.

Mouth actions total	72	100%
M	39	54,17%
W	14	19,44%
E	16	22,22%
4	2	2,78%
A	0	0%

Table 4: The types of mouth actions and the number of times they occurred in the first five minutes of video 1.

The total number of mouth actions which were annotated in the first five minutes of video one is 71. Of these mouth actions, 39 were noted as mouthings. This is 54,17 percent, which is a lot lower than what was found in the Corpus NGT study on mouthings by Bank, Crasborn and van Hout in 2016. This study showed that 80% of all mouth actions were mouthings when looking at all sociolinguistic varieties.

Discussion

As mentioned before, this research has dealt with a topic that had not previously been researched. This resulted in many challenges in regards to finding literature to base the methodology on, deciding how to properly use the data, making the annotations and figuring out the analysis of the results. Because the dataset was so limited and it was clear that only a small portion of this data would yield usable results, it was difficult to determine what would constitute a relevant piece of information or conclusion and what would merely be a coincidental result. Since two of the three participants were Chinese sign language users it was unfortunately not possible to infer what types of mouthings they were using or how often they used them, because of the lack of knowledge on the spoken and signed languages they most likely would have used. It was of course difficult to fully understand and analyse the data with the limited amount of sign language background the annotator possessed, but fortunately a lot of mouthings were found and annotated in the data from the Dutch participant nonetheless. The annotation process was long and only showed a relevant amount

of data regarding mouthing in the first of the two videos, which again limited the amount of data that could be deemed useful for this research.

Because of the very limited amount of data it is important to note that the results and implications of this research should only be read in the context of a very small case study or pilot study, which will hopefully constitute reason for further research. Since mouthings had not yet been looked at in terms of international sign language, this research is meant as an introduction to the possibility of research into this topic. This research will therefore also recommend a large number of possible questions for further research into mouthings and other aspects of international sign, which came up through the course of researching and writing.

Even though the amount of data is limited, there are still a number of interpretations which speak to the intricacies of international sign and its mouthings which can be derived from this research. At first glance it does seem clear that mouth actions and specifically mouthings are a valid component of international sign with an average of nearly three mouthings per minute over the course of a 42 minute video. This was of course only a small case study with annotations for one participant in one very specific setting of less than an hour, but it is still a start for research into mouthings in international sign, since this in the very least shows that mouthings are present in international sign (albeit in one single instance). Because of this, it would be useful to further investigate mouthing in other contexts of international sign. Since research on IS has mostly focussed on formal settings, this might also be a way to start research into mouthings in IS on a larger scale. This research focussed on a setting where two native sign language users were present, but it would be interesting to see the way mouthings are used by international sign language interpreters. Perhaps data from previous studies on other aspects of IS could be used for research into mouthings.

An average of three mouthings per minute was found in the data from participant 1 in video 1. It is important to note that even though an average of nearly three mouthings per minute was found, this number was not consistent throughout the recorded conversation. When looking at the data in segments of ten minutes each, the number of mouthings appeared to decline over the course of the conversation. This could be explained by a number of factors. One of which is that the participant noticed that her conversational partner did not respond to the mouthings with a peak in understanding. When using international sign mutual feedback of understanding is a fundamental part of the construction of the language that is used in that particular setting, as was found by Zeshan in 2015. When misunderstandings occur or understanding lacks completely, signers start to make various attempts to resolve this

and come to a form of communication that does convey what is meant clearly. When these attempts appear to be futile, other attempts are made and the previous strategy will often not be repeated in the next occurrences of misunderstanding (Zeshan, 2015). It is quite likely that Participant 1 tried to use mouthings a lot at the start of the conversation, as a strategy to convey meaning, but realised that understanding came much easier through some other form of communication, which could for example be other types of mouth actions, hand movements, more iconic signs and gestures, or fingerspelling. It would be interesting to look into the points of misunderstanding or miscommunication in further research to see what strategy did work and whether or not these were repeated more often than situations where mouthings were used. This could perhaps focus on the points of misunderstanding and the repair signs that are used in those contexts. Examples of research questions that might then be answered are: In what contexts do the mouthings add to the understanding in international sign? To what extent do mouthings add understanding in international sign when there is no common ground in the participants' spoken language backgrounds? Where are mouthings avoided in international sign and why?

Another reason why the use of mouthings might have declined over the course of this video is the way using multiple sources of language at once might affect the signer. According to the frequency-lag hypothesis bilingualism influences the time it costs to come up with the right term (Emmorey, Petrich & Gollan, 2013). This could perhaps indicate that bilingualism and bimodal bilingualism have an effect on the signer which might make using both the signed and spoken language at the same time more challenging than only using signs or words from one specific language, but right now that is merely a speculation, based on the frequency-lag hypothesis and this data. Since there was a decline in mouthings it might be the case that using international sign, or multiple language at once in general, is rather exhausting and could cause the signer to start to focus on one of the languages in their repertoire instead of multiple over the course of a challenging conversation. Participant 1 has noted herself that she started to use less English mouthings over the course of her visit to Shanghai due to the lack of knowledge the people she communicated with portrayed. It would be interesting to see the effect using language aspects from multiple established languages at once might have on the brain. Perhaps research could focus on mouthings in international sign to see the effect bimodal bilingualism has in a context where multiple languages are used to convey meaning at once, which is the case when for example using signs from NGT combined with English mouthings, which might be the case in this data.

The amount of mouthings in the context of the total amount of mouth actions differed from what Bank, Crasborn and van Hout found in their research on mouthing in the Corpus NGT in 2016. With 80% in their data and only 54% in this data, this difference seems like it should have an interesting reason behind it. It could have been caused by many different aspects of this research, or by the way the use of mouthings in international sign differs from the use of mouthings in established sign languages. First of all it is of course possible that mouthings are overall used less in international sign, but since this research has only focussed on a single participant this is rather unlikely, or at least impossible to conclude with this limited amount of data. Many other reasons for this variation exist, such as the language background of the annotator. Even though the annotations were made by someone with decent knowledge of spoken Dutch and English, their background in sign language interpretation or lipreading was very limited. Because of this, mouthings might have been missed or incorrectly annotated as other forms of mouth actions. It is important to note that the data might be incomplete because of this.

When looking at the amount of mouthings found in comparison to the number of mouth actions it is clear that there is a difference between what was found in this data and what was concluded from the Corpus NGT, which deals with Dutch sign language (Bank et al., 2016). It could also be possible that the difference in the number of mouthings came from this specific participant instead of sign language in general. Since the main part of the mouthings came from English and her native language is NGT, which uses Dutch mouthings this might have had some influence on the way she used mouthings compared to the way she would have had she been using NGT instead. It is interesting to note this difference and to look into the amount of mouthings used in international sign over a larger set of data with participants from various age groups, genders and language backgrounds. This is definitely something that would further the knowledge of international sign and its mouthings.

For this specific set of data it would also be interesting to look into the contexts where mouthings were used. As noted in the results, the mouthings seemed to occur more often in the context of specific signs, with the sign and word for 'deaf' being a very prominent example. This mouthing appeared to coincide with the appropriate sign every time it occurred. Unfortunately this could not be measured through the annotation due to the lack of glosses for signs in the existing data and a lack of time and resources to create these glosses for this research, but once all annotations for this data have been finished it would be interesting to see how often the mouthing for 'deaf' coincides with the sign for 'deaf' and if there are instances where they occur separately. If there are instances of the mouthing or sign used

separately these instances could perhaps show some insight into why or mouthings are used in international sign.

Overall this research definitely does not claim to have found any hard evidence on the use of English or mouthings in international sign, but hopes to have inspired some curiosity for further research. This data has shown a presence of both mouthings and English mouthings in an informal international setting, which could hopefully be beneficial to further research into all kinds of aspects present in international sign.

Conclusion

This research has focussed on English mouthings in international sign. The idea for this research came from an interest in international sign and the building blocks that it is made up of. Until now, one of these building blocks that had not been looked into yet were the mouth actions. Even though mouth actions have been proved to be a vital component of most sign languages they had not yet been a part of research into international sign. Another rather new aspect of this research was the context in which the data was recorded. Most IS research had focussed on more formalised types of international sign which occurred in contexts such as sign language conferences, where data mostly came from international sign interpreters, who use a much more formalised type of international sign which appears to have more structure and rules than the improvised type that occurs in informal settings (Whynot, 2016). It was decided to focus on English mouthings for now, since English appears to be the main language of choice in international settings when it comes to auditive communication (Svartvik & Leech, 2006). English mouthings are also used in American Sign Language, which has become a second language for a lot of sign language users over the course of the growth in international communication through online media.

The data used to look into English mouthings in international sign came from two videos. These videos were recorded in Shanghai by prof. dr. O. Crasborn with the aim to be used as data for research into international sign in a small and informal setting. The participants in the data had not previously met and did not have any language background in common, which made this data a uncontaminated instance of international sign. The mouth actions were annotated for the first five minutes of one of the videos and the mouthings were annotated for the entirety of the first video. The decline in mouthings which was found made it clear that video 2 would not yield useful results regarding mouthings.

It was clear that mouthings were present in this instance of international sign, with an average of three mouthings per minute. With over seventy percent of the mouthings found being English mouthings it was also clear that in this instance, English was the main language of choice for international sign. There was also a prominent decline in mouthings over the course of the conversation that was recorded first. This was in line with a comment made by participant 1, who also annotated and reviewed parts of the data before this research started. The presence of this decline was found by dividing the data into four sections, which showed an average of five mouthings per minute in the first quarter and only one mouthing per minute in the last quarter.

The results of this thesis should and can only be read as a case study or a pilot for further research. With a participant population of three, of which only one participant's data was annotated is of course not even close to enough to constitute a result that has much value. Even though the data for this research was so limited it has been a useful addition to the research on international sign, since it might inspire further research into mouthings and the use of English when looking at international sign language data. The focus when looking at international sign has mostly been on more formal settings and the understanding of IS in these settings, but a shift could be made to the production and understanding of international sign in smaller and more informal settings, as was done with the data used for this research. When looking at international sign in an informal setting this could result in more meaningful conclusions on the actual use of international sign in the Deaf community. Since international sign is a so far unprecedented possibility for international communication, that has never been seen with auditive communicators, the informal use of it should definitely not be disregarded. Research on the possibilities of international sign fall in line with the use of the term Deaf gain, which refers to the possibilities Deaf individuals have over hearing people.

Another possibility for research that looking into mouthings in international sign could inspire is the intricacies of bimodal bilingualism. Since the use of spoken language and sign language simultaneously is clearly what happens when international sign is used with present mouthings, this might show how sign language users switch between the languages in their language background in order to create understanding and meaning while using all possibilities they possess for communication.

Aside from the focus on mouthings and the English language this research has also touched on the way international sign is formed through mutual feedback. This was not the intention of the research at first, but when looking at the data it became clear that the use of mouthings and English altered over the course of the conversation. Participant 1 used a lot of

mouthings at the start of video 1, but these declined very clearly throughout the data. When looking into this decline and the use of mouthings in other IS data this might show how and why this decline in mouthings came to be. A possibility is that this will show more information on the way mutual feedback comes into the formation of international sign. When signers try to establish communication in an international setting it is clear that they rely on their known languages as building blocks, but the decision for which building block to use in which contexts seems to come from trial and error at first. This data might have shown that participant 1 tried to use her knowledge of the English language to communicate with participant 2, but rather quickly realised that this did not add anything to her making her signs and communication overall more understandable to participant 2. It would be interesting to learn more on what the feedback she received looked like and where her decision, whether conscious or unconscious, to use mouthings and English less came from.

To conclude, English mouthings in international sign language are definitely present in this data and are expected to be an interesting topic for further research into this and other forms of data relating to international sign. The way mouthings are used and the languages that are used when forming them could show a great deal of information regarding the way international sign is formed, where the building blocks for international sign comes from and how bimodal bilingualism plays a role when using multiple languages at once in order to create understanding in an international setting. It would be interesting to learn more about how mouth actions and mouthings are used as a component of international sign, in comparison to more established sign languages and in the many types of settings international sign occurs in.

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