ANNOTATION CONVENTIONS FOR THE CORPUS NGT

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Acknowledgments

The design of our annotation structure is partly guided by what our annotation tool (ELAN) can and cannot do. Over the past ten years we have productively collaborated with the main ELAN developers at The Language Archive of the Max Planck Institute in extending the functionality of ELAN. We would like to thank in particular Han Slöetjes for his support in these developments.

These guidelines build on the annotation guidelines that were developed for the ECHO project; we thank our collaborators in London (Bencie Woll) and Stockholm (Brita Bergman and Johanna Mesch) for their insights. We further owe a great deal to published annotation conventions for DGS (Heßmann 2001) and Auslan (Johnston 2014). Most recent modifications were made in the context of the Digging into Signs project, a collaboration with Kearsy Cormier (University College London).

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Earlier Dutch versions of these conventions have been edited and translated to English by Karlijn Hermans and Anne de Meijer.

1. Preface

The present document describes the annotation conventions as they are used for the second release of the Corpus NGT annotations, made available online in 2013. The Corpus NGT is a collection of over 70 hours of dialogues between deaf native and near-native NGT signers from the Netherlands (Crasborn, Zwitserlood & Ros 2008; Crasborn & Zwitserlood 2008). It was published as an open source video collection in 2008, and is hosted by the Language Archive of the Max Planck Institute for Psycholinguistics. A small minority of all sessions is not publicly available due to privacy restrictions; these are marked with the suffix "NP" (non-public) in the filenames of both media files and annotation files. Further information about the movies can be found on the corpus web site, www.ru.nl/corpusngtuk. A version of this web site for a general audience is available in Dutch (www.ru.nl/corpusngt), German (www.ru.nl/corpusngtde), and English (www.ru.nl/corpusngten); these sites link to versions of the video clips on a web server.

In the initial phase of recording and archiving the movies, a restricted number of movies were annotated with glosses for lexical items. In the second release of the Corpus NGT annotations, the number of files that have been annotated has grown to **341** (totalling **14** hours and **24** minutes). A total of **52** files (**2** hours and **30** minutes) has also received a narrow translation. A substantial part of this annotation work has been carried out for the SignSpeak project, which focuses on language technology for signed languages. The present document reflects the annotation conventions that were in use at the start of 2011. Especially the *Gloss* tiers have seen a substantial change since the first release of the corpus. (The annotation conventions used at the time were described in version 1 of this document.) The present release of the corpus aims to use 'ID Glosses' (Johnston, 2008) that link to a newly created lexical database; this is further described in sections 5.1 and 5.3.2).

In addition to the core *Gloss* and *Translation* tiers, which serve a general purpose in making the corpus accessible to other researchers, the present document proposes a set of annotation tiers that likewise can serve a general function in that observable communicative behaviour in the videos is represented as searchable text in annotation documents. These tiers (for non-manual behaviours, for example) do not serve to help answering a particular research question, but they may be of benefit to a wide group of researchers. While few of these tiers have been intensively used at this point in time and we do not specify detailed annotation guidelines for them, it is considered of great importance that they are present in any annotation document, so that observations can be added on the appropriate tier. In particular, we promote users of the corpus to systematically separate form from function, by including tiers for various manual and non-manual articulators.

Furthermore, we hope that publishing the corpus with a systematic set of tiers even though they are empty, can help promote standardisation of sign language corpus annotations, as argued for by Schembri and Crasborn (2010). The aim has been to create a systematic distinction between ID glosses, properties of phonetic forms as they appear in context, and grammatical, semantic, and pragmatic distinctions. This effort is based on experiences in the ECHO project (Crasborn et al, 2007), publications on the Auslan corpus and lexical database (Johnston, 2011; Johnston & Schembri, 1999), and discussions in the workshops of the Sign Linguistics Corpora Network. Ongoing efforts aim to extend the standardisation of annotations to the actual values of annotations within ISOcat (Crasborn & Windhouwer, 2012; Crasborn & Slöetjes, 2014).

2. Use of ELAN in a team setting

The second release of the Corpus NGT annotations have been made with ELAN versions between 3.0 and 4.7.2. Some conventions were specifically created to exploit the functionality present in ELAN, which may become superfluous or unnecessary with future developments of annotation tools. (For example, see the distinction between S1/S2 and a code referring to individuals in the next section.) Information about ELAN and the ELAN Annotation Format (EAF) can be found in the manual on its home page, tla.mpi.nl/tools/tla-tools/elan.

These versions of ELAN are not specifically created for collaborative work: users cannot work on the same file simultaneously, and have to exchange files in some way outside ELAN. In Crasborn and Slöetjes (2010) we describe a workflow using a Subversion server that we have set up to allow for both archiving of every version of an annotation file that we have created, and to make new annotations added by anyone in the team rapidly available to other team members. We also describe some of the functions in ELAN that we have helped to develop that facilitate working with a large corpus of annotation files, such as the batch-wise addition and deletion of tiers, and improved multiple-file search functions (see also Crasborn et al. subm.). Related development of functions in ELAN in connection with sign language corpora and lexicon data is described in Crasborn and Sloetjes (2008), Crasborn, Hulsbosch and Sloetjes (2012), and Crasborn and Slöetjes (2014).

As the annotation files for every Corpus NGT session contain tiers for a variety of research projects, we now have over 200 tiers in every file, as is described in the sections below. The use of different folders of preference files for each user or for each purpose facilitates working with these large documents, only displaying a subset of tiers. We are currently working on a dedicated function in ELAN that facilitates the flexible use of subsets of tiers.

3. Overview of Linguistic Types and Tiers

The Corpus NGT fully consists of dialogues. In the tier names, there is a systematic reference to the signer 'on the left' (S1) and the signer 'on the right' (S2). The camera on each signer was positioned so that when viewed side-by-side, the impression arises that the signers are looking at each other, as the following screen shot of ELAN illustrates. If there were more than two participants in the recordings, further S-codes could be used.

Figure 1. Seeing two signers in a dialogue side by side

For most types of annotation layers, there is a separate tier for the two signers, so as to be able to search for annotations by signer. Within ELAN, this is made possible by including a reference to individuals in the *Participant* property of tiers. To provide an anonymous alternative to using names or initials, an S followed by three digits (e.g. "S056") is used to refer to individual participants in this *Participant* tag. The tier names, however, refer to S1 and S2, as the person sitting on the left and the right, respectively. The distinction between *Tier S1* and *Tier S2* therefore merely serves to keep annotations for different participants separated and to allow for overlapping annotations for the two signers, but it has no meaning across files for different participants. The Participant code can be used in searches in ELAN. In the present version (4.0.0), it is not included in every export of annotations yet. In such cases, the participant codes have to be added after exporting annotations on the basis of the combination of the file name and the S1/S2 part of the tier name. The same holds for the *Annotator* property of each tier.

In many cases, two tiers that are distinguished by S1/S2 in their names can be referred to jointly by their unique Linguistic Type. Thus, the tiers *Head movement S1* and *Head movement S2* have a Linguistic Type that is called *head_mov*, so that the two tiers can be addressed with a single search action. Similarly, many tiers refer to the left and the right hand of each signer (such as *GlossL S1*, *GlossR S1*, *GlossL S2*, *GlossR S2*), and they can be addressed together by their Linguistic Type *gloss*.

LinguisticType	*headmov*	Shared for whole corpus
Tier S1	*Head Movement S1*	Shared for whole corpus
Participant	S043	Specific to each session
Annotator	OC	Specific to each session
Tier S1	*Head Movement S2*	Shared for whole corpus
Participant	S043	Specific to each session
Annotator	OC	Specific to each session

Similarly, tiers that are specific to the left and the right hand include 'L' and 'R' in their name, after a word or phrase referring to the nature of the tier. For example, *GlossL S1* and *GlossR S1* refer to the glosses of the left and the right hand (of the first signer). *HandshapeL S1* and *HandshapeR S1* refer to the handshape in context of the left and right hand of the first signer. By adding 'L' and 'S1' after the word or phrase describing the nature of the tier, it is easier to select tiers in various places in ELAN where tiers are alphabetically sorted: the various handshape tiers then appear below each other, and can easily be included or excluded from a search or shown or hidden from display.

In the rest of this document, we will distinguish different groups of tiers. Some are already intensively used in current research projects, others have only been created to enforce the focus on distinguishing the phonetic form of communication from the meaning and functions. This will be reflected by the amount of detail in the annotation conventions as described in this version of the document. The following groups of tiers are distinguished in the remaining sections of this document:

- Translation
- Gloss
- Phonetics of manual signs
- Linguistic analysis of manual signs
- Mouth
- Other non-manuals
- Observations
- Administrative information

All tiers that make use of a 'controlled vocabulary' (CV; a list of possible values) are bilingual, having both a Dutch and an English value and description. A default language can be set in the ELAN preferences. Annotations on tiers that are not linked to a CV, like the *Meaning* and *Translation* tiers, are currently either in English or in Dutch.

4. Translation

A distinction is made between ‘free’ translation and ‘narrow’ (or literal) translation, on corresponding sets of tiers. The idea behind this is that different types of translation serve different purposes:

Free Translation:

- leading to smooth running text in the target language
- length of sentences partly determined by the spoken language translation; relatively long sentences
- use of referential expressions appropriate for the target language
- most helpful for general understanding of the discourse, whether by linguists or other users

Narrow Translation:

- staying close to the source text in the division of clauses or sentences, leading to relatively short sentences
- referential expressions translated as neutral as possible; pointing signs typically translated by pronouns and determiners rather than full NPs
- no need to lead to smooth running text in the target language
- helpful for understanding the structure of the sign discourse, and useful for training and testing machine translation algorithms

For the present version of the Corpus NGT, only the *Narrow Translation* tiers have been used. Their annotations, however, often contain fairly free translations – up to the use of multiple sentences in a single annotation. It appears to be a difficult task for annotators to perform, whether deaf signers or hearing interpreters. Both the goals and the workflow of the translators are in need of revision.

For some sections of files, multiple alternative translations have been added, separated by two slashes (//).

Finally, a set of *Interpreter* tiers is available for each file, to contain transcripts of the voice-over that has been added by interpreters to some of the files. This alternative workflow to lead to written translations has however not been used on a large scale yet.

5. Gloss annotations

5.1. Introduction to glossing of the Corpus NGT

In the annotation files, glosses are assigned to all communicative manual activities. These glosses are intended to indicate the exact start and end time of the signs, as well as to refer to a lexical database (for lexical signs) or provide information about their composition or form and function (for non-lexical signs). Lacking a common orthography for sign language, or a commonly used phonetic notation system, Dutch and English words have been used as a reference: ID glosses in the sense of Johnston (2008). ID glosses (Dutch and English words in our case) are not actual translations of the signs, but pointers to lemmas in the lexical database. If necessary, the meaning of the lexical item in a particular context can be added in a separate annotation.

In the first release of the Corpus NGT, it was intended to use glosses referring to a lexical database without actually having such a database. By consequence, the glosses that were intuitively assigned to signs were glosses that typically were a good Dutch translation of the sign in that context. Further, it was not always efficient to consult the dictionaries of the Dutch Sign Centre (NGc) on DVD or the internet, and the available dictionaries did not always contain the forms that were observed. The glossing process was therefore rather intuitive and the corpus annotations contained many inconsistencies. For the second release, an effort was made to remove inconsistencies and to ensure that all glosses refer to a lexical database or were explicitly marked as non-lexical signs (Crasborn & de Meijer, 2012). In the process of creating ID glosses and ensuring consistency, the NGT Signbank has been created, modelled after the Auslan Signbank. In the following sections, first the construction of the NGT Signbank will be addressed (5.2), followed by the presentation of the glossing conventions (5.3), and a summary of the use of special symbols in annotations (5.4).

5.2. The NGT Signbank

The NGT Signbank was created as part of a cyclic process, revising individual glosses after the initial intuitive glossing. By inspecting all sign forms that were glossed as a particular gloss, it was established whether indeed the gloss referred to a single lexical item (with a constant lexical phonological form), and could thus be entered as an ID gloss in the lexical database with a phonological description. If one gloss referred to multiple phonological forms, multiple ID glosses were entered: either as distinct entries or as the same entry distinguished by a letter-suffix (see also 5.3.9, Variants).

The NGT Signbank is intended as a lexical database independent from the Corpus NGT. However, the glosses in the corpus cannot be interpreted without Signbank, as it provides, next to the phonological description, additional information for annotators creating new gloss annotations. A field ‘Related glosses’ denotes ID glosses which are semantically related. It encodes for instance homonyms, ID glosses with identical phonology, but with different meanings.

At the moment, NGT Signbank has been built step by step on the basis of signs encountered in the Corpus NGT. As annotation work proceeds, it will slowly grow. Moreover, it will increasingly also be used for the annotation of other resources, and thus contains NGT signs that may not occur at all in the corpus NGT. The lemmatisation procedures depend in part on empirical evidence from signs in context in various corpora. It may well be that homonyms, now consisting of two or more separate entries, will later be re-analysed as one lexical item, or that some glosses will later have to be revised, as the choice of the Dutch word(s) is semantically unfortunate, e.g. not resembling the core of the meaning of the sign. Moreover, the form of the sign as described in the lexicon could turn out not to be the default or most common form. It is work in progress, therefore.

5.3. Glossing conventions

5.3.1. Basic principles

The basic principle of glossing is to label every meaningful manual activity. To do so, there is a separate tier per signer per hand, so four tiers are used: *GlossL S1* (left hand signer 1), *GlossR S1* (right hand signer 1), *GlossL S2* (left hand signer 2) and *GlossR S2* (right hand signer 2). If a sign is made with the left hand, the sign is annotated on the GlossL tier. If the sign is made with the right hand, the sign is annotated on the *GlossR* tier. If a sign is made with two hands, both hands are annotated on their respective tiers, each according to their own length.

The labels (glosses) are set in capital letters and usually consist of a single Dutch word. The principle rule for glossing is to look at the form of the sign. A gloss is provided as clear and unambiguous as possible, i.e. a gloss consistently refers to the same form. Thus, though body and face often express additional or a different meaning, this is ignored in the glossing. For example, when the signer makes a manual sign accompanied by a head shake, only the manual sign is annotated, not the negation. Consequently, glosses are not actual translations, but merely pointers to a specific form.

Although the idea of 'same form, same gloss' seems sound and simple, to put it into practice is less so. Underneath, exact rules, exceptions and guidelines for assigning a gloss are laid out. First, rules for marking the beginning and the end of signs and sentences are presented. Second and third, the rules for ID glosses and non-lexicalized forms are outlined, and in addition a list of symbols used in the annotations is provided.

5.3.2. ID glosses

ID glosses are assigned to sign forms that are included in the NGT Signbank. As explained above (5.1) an ID gloss is a gloss that consistently refers to the same sign form. In the process of constructing the Signbank, numerous decisions were made for ID glosses for particular sign forms. Guidelines for assigning an ID gloss to a sign form are presented below. These guidelines can be used when adding new glosses to the lexicon.

One sign form can have several translations and refer to different grammatical classes, depending on the context. Glosses are assigned context-independently, however. Thus, an ID gloss is not a translation and in many cases not indicative of the grammatical class of the sign. For example, the gloss FIETSEN (Dutch verb for riding a bicycle) can refer to the object (*fiets*, 'bicycle') as well as to the action (*fietsen*, 'riding a bicycle').

The basic rules for assigning a gloss to a sign:

- A gloss consists preferably of one Dutch word;
- If a single Dutch word does not suffice, multiple Dutch words can be used as a gloss, separated by hyphens '-';
- The Dutch word is the most neutral choice with respect to meaning, covering possible multiple interpretations;
- The Dutch word is the most neutral choice with respect to grammatical marking, i.e. unmarked forms of the Dutch word. For a noun this is the singular form, for a verb this is the infinitive.
- In case of sign synonyms, glosses receive alphabetical added marking, e.g. '-A', '-B' (see 5.3.9, Variants)

5.3.3. Start and end of a sign

5.3.3.1. One-handed signs

The start and end of every sign is indicated as precisely as possible. For defining the boundaries of the sign the following criteria are used:
A sign starts:

- (if the sign contains a path movement) at the first frame in which the hand is starting to move away from the place where the sign started, towards the end-location of the sign.
- (if there is no path movement) at the first frame in which the handshape is starting to change.
- (if there is no path movement and no change of handshape) at the first frame in which the orientation of the hand is starting to change

Often, not all features of a sign are present at the same moment. In such cases, the first recognizable feature of the sign is taken as starting point. For example, when a handshape is fully formed, while still moving to the location where the movement of the sign will start, the frame on which the handshape is fully formed is taken as starting point.

A sign ends:

- before the first frame in which the handshape starts to change (at the end of the sign)
- before the first frame in which the hand starts to move away from the end location of the sign

In contrast to the start of the sign, all features have to be finished before marking the end of the sign. For example, when the handshape is already changing, but the movement is not finished yet, the frame before the movement starts to change is the end of the sign, and not the frame before the handshape change.

Sometimes the end of one sign is the start of another sign. In these cases, where a sign seamlessly transfers into the next sign, intuition is used to separate the two.

5.3.3.2. Two-handed signs

Each of the two hands in a two-handed sign is annotated on its respective tier, according to the definitions for one-handed signs above.

Sometimes a hand (most often the weak hand) is held while the other hand continues signing. The gloss for the hand that holds continues until the hand drops or becomes part of another sign. The duration of the movement and of the hold can be marked on the *MoveHold* tier (see also 5.3.19, Classifier constructions).

For signs that occur in both one-handed and two-handed forms, Signbank describes the two-handed variant; variants of the lexical entry in the corpus will not receive the '-A' and '-B' suffixes.

5.3.4. False starts

Sometimes a sign is not fully articulated. The signer starts a sign, but then hesitates, changes his mind or recovers himself. These cases are indicated as false starts by a tilde '~' preceding the gloss. This is not used for general phonetic reduction (e.g. sloppy articulation).

5.3.5. Marking uncertainty: ?, ?? and ???

When an annotator is not sure about how to interpret a sign but is able to make an educated guess, a question mark is added before the gloss.

(1) ?BOEK

When an annotator recognises a hand movement as a sign but does not know which sign it is, or which gloss it should receive, a double question mark '??' is annotated. '???' Is used when, after discussion of the manual action by several annotators, it is still not clear which sign it concerns. ± is used when the annotator is not sure whether a particular manual action concerns a sign.

5.3.6. Non-visible signs

When a sign is unrecognisable because it is articulated (partly) outside the video window, or behind a body part like the other hand or the head, it is annotated with a single exclamation mark '!'. When that sign is partly visible and a guess can be made what it means, its annotation is preceded by an exclamation mark, for example !SIGN.

5.3.7. Counting and the counting hand

Signs for **numbers** are glossed in numbers, not written out words. For example:

(2) 1-A 'one'
(3) 1-B 'one'
(4) 12-A 'twelve'

Exceptions to this rule are the signs MILJOEN (1,000,000) and MILJARD (1,000,000,000).

Signs for cardinal numbers are glossed with digits. Ordinal numbers are also glossed with digits, plus the additional marking '.ORD'.

(5) 1.ORD 'first'
(6) 2.ORD 'second'

Composed numerals are glossed as fixed combinations (see also 5.3.14, Compounds):

(7) 182-A 'one hundred and eighty-two'
(8) 182-B 'one hundred and eighty-two'

If a number is incorporated into a sign, the number is represented by digits and not by words. The digit is placed after the gloss, separated by a plus sign.

(9) UUR+1 'at one o'clock'
(10) UUR+4 'at four o'clock'
(11) UUR-LANG+2 'a period of two hours'
(12) WEEK+3 'a period of three weeks'

Listing or summing up on the hand is glossed as TELHAND ('counting hand') on the hand that holds the list, including a specification of the extended fingers (e.g. TELHAND-1-A). Note that this specification is identical to glossing cardinal numbers. For each finger sequentially added to the TELHAND a new annotation is made. Sometimes a signer sums up without extending a specific number of fingers; in one smooth movement all fingers get extended. In this case, TELHAND cannot be specified, so simply TELHAND is used.

(13) TELHAND-2-B
(14) TELHAND-1-A TELHAND-2-A TELHAND-3-B
(15) TELHAND

When the hand not holding the list points towards the list or TELHAND to refer to a point in the list, this point is glossed as PT, with a specification of the finger of the TELHAND that is pointed at (PT:D, see also 5.3.11, Pointing signs). When more than one finger is pointed at at the same time, all fingers that are pointed to are specified, separated by hyphens (PT:W-M-R).

(16) PT:D ('point at thumb')
(17) PT:W-M-R ('point at index, middle and ring fingers')

If no specific fingers are pointed at, but instead the whole list is indexed with one 'sweeping' movement, the gloss ENZOVOORTS-C (a variant of 'etcetera') is used.

(18) ENZOVOORTS-C 'et cetera'

Signs that are made by index and middle finger and mean something like 'together' are glossed as follows:

(19) TWEEEN (no diacritics) 'two together'

If it is clear from the sign that the meaning is 'we', 'they', or 'you', then this can be added on the *Meaning* tier.

5.3.8. Verbs

If a Dutch verb is chosen as a gloss for a sign, the infinitive is used, not an inflected form. Some NGT verbs can be used directionally (to indicate one or more referents involved in the event expressed by the verb). The direction of a verb is only marked if:

- the direction of the sign is towards or from the signer
- there is indeed a directional movement, not merely the direction of the citation form

A directional movement towards the signer is marked with ':1' following the ID gloss:

(20) VRAGEN 'to ask'
(21) VRAGEN:1 'to ask me'

A movement away from the signer is marked with '1:' before the ID gloss:

(22) OVERNEMEN 'take over'
(23) 1:OVERNEMEN 'take over from me'

The sign VRAGEN ('to ask'), for example, can be used directionally. However, if no specific direction is articulated, the sign starts at de signer (citation form). Therefore, this sign should not be annotated as 1:VRAGEN.

The (directional) sign that can be interpreted as an auxiliary and usually is accompanied by the mouthing 'op' is glossed as HOP (*Hulpwerkwoord OP*, 'auxilary OP') and may receive the additional markings ':1' and '1:'.

5.3.9. Variants

5.3.9.1. Form Variants – same meaning, different form (synonyms)

Signs that have the same meaning but different forms (NGT synonyms) receive the same gloss with an added alphabetical marking, such as. 'SIGN-A', 'SIGN-B'.

One-handed articulations of two-handed signs are not specified as form variants, but are simply annotated on one tier only. Information about handedness stored in the phonological description of the sign in Signbank.

5.3.9.2. Translation Variants – same form, multiple possible translations (polysemes)

Signs that have the same form can have multiple, related Dutch translations, depending on the context. Often, these related translations are articulated on the mouth (see 9, Mouth). A neutral Dutch equivalent of the sign is used as a gloss. All possible translations are listed and can be looked up in the NGT Signbank, so the annotator is referred to the correct gloss.

(24)	BESLUITEN	'beslissen, bepalen, besluit, knoop doorhakken, vaststellen, concluderen'
	(DECIDE	'resolve, determine, decision, cut the knot, assign, conclude')

The exact meaning of the sign in context can be specified on the *Meaning* tier; specifying mouthings can be annotated on the *Mouth* tiers (see 9, Mouth).

5.3.9.3. Homonyms – same form, unrelated meanings

Signs that have the same form but different, unrelated meanings receive different glosses. In the NGT Signbank, these similar forms are linked with each other in the in the Related Signs field.

5.3.10. Plural forms

In case a plural interpretation can only be derived from the context, plurality will not be marked. Although many NGT signs do not have a plural form, other signs do. These forms receive a separate entry and phonological description in the Signbank. They are annotated with the gloss for the singular form with an added '.PL' (and not with the plural form of the Dutch gloss).

(25)	KIND	'child'
(26)	KIND.PL	'child.pl' and not 'children'

5.3.11. Pointing signs

The ID-gloss for a pointing sign is PT. In annotating a pointing sign, the focus is on the form of the pointing, to the extent that forms can be systematically distinguished: *direction* of points is annotated for spatial directions like up and down; *location* of points is annotated for pointing to specific fingers of the weak hand. The referent of a pointing sign is annotated on the *Reference* child tier(s). Grammatical class distinctions may be specified on the grammatical class child tier *GrammClass*.

The following rules apply:

- When there are separate points to different locations, multiple PT annotations are created.
- If a signer combines multiple locations in one 'sweeping' movement this is annotated as PT:arc.

- If a point to the same place is signed more than once, PT annotations are made for each instance.
- This should be distinguished from several short, repeated movements within a single pointing sign (i.e. repetition), in which case one PT annotation is made and aligned with the whole sign (including the repetition).

The handshapes of pointing signs are not indicated in the gloss, but can be specified on the *Handshape* tiers.
Some pointing signs are directed towards fixed locations, such as the signer's torso, a finger of the other hand, etc. In these cases, the location is included in the annotation, as follows:

	Dutch gloss	English gloss	Description
•	PT:1	PT:1	point to self
•	PT:BL	PT:BL	point toward a (meaningful or intended) location at the body of the signer
•	PT:O	PT:U	upward point (Omhoog)
•	PT:B	PT:D	downward point (Beneden)
•	PT:D	PT:T	point towards thumb (Duim) (See also 5.3.7, Counting hand)
•	PT:W	PT:I	point towards index finger (Wijsvinger) (See also 5.3.7)
•	PT:M	PT:M	point toward middle finger (Middelvinger) (See also 5.3.7)
•	PT:R	PT:R	point towards ring finger (Ringvinger) (See also 5.3.7)
•	PT:P	PT:P	point towards little finger (Pink) (See also 5.3.7)
•	PT:W-M-R	PT:I-M-R	point towards a combination of fingers (See 5.3.7)

PT:O and PT:B are only used when a sign is made clearly upward or downward. If this is not the case, the gloss should be PT.

If the signer points to a body part with the intention to refer to that body part (and not to a specific location on that body part) the sign is not glossed as a pointing sign but as the body part it is referring to, e.g. NOSE, KIDNEY).

In case a signer points to a referent on a body part (e.g. a fly on the nose) the gloss should be PT:BL. The intended referent can be annotated on the *Reference* tier.

In case a pointing sign is simultaneously combined with the palm-up sign, this is glossed as PT+PO. (See also 5.3.15, Merged signs.)

5.3.12. Palm up, palm down, palm forward

Palm Up signs are not easy to characterize. It can mean things like 'see what I mean?', 'I agree with you', 'it's your turn', and so on. Also, the handshape can differ: the hand is not always exactly the B-hand, there may be different selected fingers that are not necessarily stretched. All occurrences of Palm Up are glossed as PO (Palm Omhoog 'palm upwards'). A less frequent sign has the palm facing forwards and is glossed as PV (Palm naar Voren, 'palm forward'). There is also a sign with palm downwards that is glossed as PB (Palm Beneden 'palm down'). The latter sign expresses the size of the family, an area etc.

Note: PO signs that have a clear meaning, such as WAT ('what'), WAAR ('where') or ZO ('as such') receive their own glosses and are not glossed as PO.

Summary:
(27) PO: palm of the hand points upwards
(28) PB: palm of the hand points downwards
(29) PV: palm of the hand points to the front

5.3.13. Incorporated Negation

Negation may be expressed non-manually (to be annotated on the *Head Movement* tier), with a manual sign (receiving its own gloss), but it may also be incorporated in certain verbs. Verb signs that are manually modified for negation are glossed with the negation suffix '-NIET':

(30) WILLEN-NIET 'want not'
(31) KUNNEN-NIET 'cannot'
(32) HOEVEN-NIET 'not necessary'
(33) WETEN-NIET 'know not' (Groningen variant)

Care should be taken to not use these –NIET combinations for negatively polar verbs that do not have an incorporated manual negation, like NIET-HOEVEN 'need not'.

In order to facilitate searching and computer recognition it is important the verb precedes the negation in the annotation, so *not* like NIET-WILLEN. However, since

5.3.14. Compounds

Compounds are annotated with a single gloss, and they are entered in Signbank with a reference to the constituting parts (in the morphology panel, under development).

(34) RIJBEWIJS 'driving licence'; in Signbank: reference to constituting parts CAR and BOOK

If there is doubt about the actual compound status (e.g. no change in phonology, or no specific semantics), then we annotate them as two separate signs.

(35) DEAF SCHOOL 'deaf school'; no compound, two separate glosses

Guidelines for deciding whether a sign sequence concerns a fixed combination are:

- The combination has a specific meaning of its own
- The meaning of the combination may not be (fully) predictable from its parts
- It is not possible to insert another sign between the elements without a change in meaning
- Phonological or prosodic cues

5.3.15. Blended signs

When two signs are blended into one manual action (phonologically a single syllable), the glosses for both signs are included in the annotation, separated by a '+'-symbol.

(36) PO+PT

5.3.16. Fingerspelling

If a signer is fingerspelling, all letters that are actually articulated are transcribed, and preceded by a hash '#'.

(37) #INGE #VSO

If a signer is spelling multiple words, a separate annotation is made for each word.

(38) #JOHAN #ROS not: #JOHANROS

If a signer fingerspells only one letter, but in addition mouths a whole word (for example a name), only the spelled letter is glossed, with the #-sign preceding. The mouthing is described at the *Mouth* tier (see 9, Mouth). The two-handed variant of the letter X (making a cross with two index fingers) is not glossed as a variant of the letter X (so not something like #X-B), but by annotating #X on both the *Gloss* tiers, aligned with the actual articulation by each hand.

5.3.17. Name signs

Name signs for persons are marked with an asterisk '*' preceding the gloss. The gloss will be the first and last names for that person *FIRST_NAME-LAST_NAME. If a name sign happens to be identical or related to a lexical sign, this can be marked in the NGT Signbank by linking the signs in the Related Signs panel.

If the annotator recognizes a sign as a name sign, but does not know the person's Dutch name, the sign is annotated as *NAAMGEBAAR (name sign). Geographical names, brands, etc. are not marked with an asterisk. If a name is fingerspelled, the conventions for fingerspelling are followed (see 5.3.16, Fingerspelling).

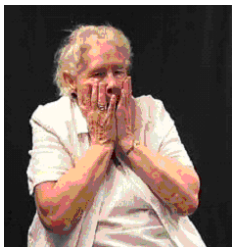
5.3.18. Gestures

Gestures with a fixed form and meaning receive their own gloss (i.e. their own entry in Signbank, where it can be specified that this sign is likely a gesture). Other gestures are annotated with only the percentage character '%'. The meaning of these gestures can be specified on the *Meaning* tier.
Some examples:

(39)  HEE

(40)  EHM

(41)  HAHA

(42)  OOH

(43)  %

5.3.19. Classifier constructions

Classifier constructions concern predicates that express a spatial movement, a change of position/orientation, a location, or the existence of a referent. In these constructions, the classifier (that is expressed by a particular shape of the hand) is linked to the referent of the predicate. These constructions are annotated as combinations of a predicate (expressed by the movement) and the classifier (expressed by a shape of the hand(s)), as in the schema in (44).

(44)

Gloss tier:	TYPE+HANDSHAPE
Meaning tier:	translation of the classifier construction
Translation tier:	translation of the whole sentence (may be just the classifier construction)

We distinguish four types of classifier predicates, described below in section 5.3.19.1:

- MOVE
- PIVOT
- AT
- BE

Section 5.3.19.2 gives an overview of the handshapes that are typically used in these predicates. Section 5.3.19.3 provides guidelines how to decide between classifier predicates and lexical signs. As for other signs, the meaning of the predicate in a particular context is annotated on the *Meaning* tier related to the *Gloss* tier.

5.3.19.1. The different classifier predicates

MOVE expresses an intentional, meaningful path movement of a referent through space, i.e. from one location to another location. MOVE can concern an independent movement of a referent (e.g. a cat moving to and fro, as in example (45), or a manipulated movement (e.g. a case and a birdcage being picked up), as in example (46).

(45)

GlossL		
GlossR	CAT-C	MOVE+2
MeaningR		cat walks to and fro

(46)

GlossL	CASE	BIRD-A	BIRDCAGE-A	MOVE+fist
MeaningL				lift case
GlossR		BIRD-A	BIRDCAGE-A	MOVE+fist

MeaningR	lift birdcage

Sequences of movements with different meanings and a visible break between two parts should be annotated as sequences of two movements. They will receive different translations on the *Meaning* tiers.

PIVOT expresses a change of position of a referent, expressed by a change in hand orientation. Although here, too, there is an intended, meaningful movement, it does not indicate a spatial trajectory but rather a movement around a pivot point, as in examples (47)(2nd still) and (48).

(47)

GlossL	PLANK	
GlossR	PLANK	PIVOT+flat
MeaningL+R		plank pivots

(48)

GlossL	PIVOT+1
GlossR	PIVOT+1
MeaningL+R	the cat's legs move around

In case a classifier construction concerns both a movement through space and a change in the referent's orientation (e.g. expressing that a referent falls down from a window), this is annotated as MOVE (*not* as PIVOT, *not* as MOVE+PIVOT). The precise meaning, including the rotation aspect, can be translated on the *Meaning* tier.

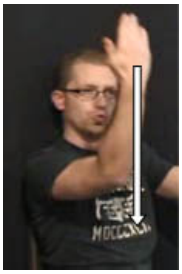
AT expresses the localization of a referent, i.e. when the hand makes a (short) movement towards a particular location in signing space, to indicate that the referent is at that location, as in example (49).

(49)

GlossL	BIRD-A	
GlossR	BIRD-A	AT+2
MeaningL+R		bird is here

BE is used in cases where a signer uses a classifier but there is no visible movement, localization, or change of position, as in (50)(2nd sign, left hand). BE is also used when the classifier is held still in space after a MOVE, PIVOT, or AT construction while the other hand makes at least one other sign, as in example (51). Note that this is an exception to the general convention for annotation alignment, when an annotation ends at the frame where the hand moves away from the end position of a sign or changes shape or orientation.

(50)




GlossL		BE+flat
MeaningL		wall
GlossR	WALL	MOVE+2
MeaningR		cat moves against wall

(51)

GlossL	MOVE+fist	BE+fist----------	
MeaningL	cat picks up bird cage	bird cage----------	
GlossR	MOVE+fist	CASE	MOVE+fist>5
MeaningR	cat picks up case		cat throws case away

(52)

GlossL	MOVE+O	BE+O----------	
MeaningL	ball spirals down	ball ----------	
GlossR		CAT	MOVE+2
MeaningR		cat	cat moves up

5.3.19.2. The classifier handshape codes

A classifier construction is glossed as a combination of the gloss of the predicate and the shape of the classifier. For the classifier handshapes, the codes in the table below are used. If a classifier form other than these is encountered, it can be added after agreement between annotators.

Code	Forms	Examples of possible meanings
1		Long thin objects (e.g. pen, person)
2		Dual objects (e.g. legs, arms)
3		Three long thin objects (e.g. pen, person)

4		Four long thin objects (e.g. pen, person)
5		Many
flat		• Flat objects (e.g. paper) • Handling of flat or large objects (e.g. pile of towels, box)
O		(Handling of) cylindrical or spherical objects (e.g. ball, pole)
cylinder		(Handling of) cylindrical objects (e.g. pole)
sphere		• Round, bulky or shapeless objects (e.g. ball, pile, town) • Handling of spherical objects (e.g. ball, apple)
closed		Handling of thin flattish objects (e.g. sheet of paper)
open		Handling of thick flattish objects (e.g. book)
small-closed		• Flat round objects (e.g. coin) • Handling of thin or very small objects (e.g. handkerchief, pin)
small-open		• Flat round objects (e.g. coin, saucer) • Handling of small or flattish objects (e.g. sugar cube)
fist		Handling of (thin) objects (e.g. pole)
grip		Handling of (thin) objects (e.g. fishing rod)
Y		Objects with 2 opposite extensions (e.g. airplane)

5.3.19.3. Deciding between classifier constructions and lexical signs

Sometimes it is difficult to decide whether a sign should be glossed as a classifier construction or a lexical sign (i.e. a sign with a fixed form and a specialized meaning). This is especially challenging when the sign expresses or implies a movement, for example in DANCE (53) or MEET (54).

(53)

GlossL	DANCE
GlossR	DANCE

(54)

GlossL	MEET
GlossR	MEET

Guidelines to distinguish a classifier construction from a lexical sign are the following:

- Classifier: The classifier predicate represents a movement or a location of a referent through or in space;
- Classifier: The signer looks at his/her hands while articulating the sign, as in (52), and (55);
- Classifier: The signer uses a specific body posture or facial expression, as in (45), (46), (48), (49), (50)(2nd still), and (52)(1st and 3rd stills);
- Lexical sign: Both the form and the meaning are conventionalized and relatively invariable.
- Lexical sign: The signer does not look at his/her hands while articulating a sign, as in (53) and (54).
- Lexical sign: The signer mouths the Dutch word while articulating the sign.

Note that these are pointers, and not rules cast in stone. As such, they will not always provide sufficient means for the distinction. See also the NGT Signbank guidelines for deciding on when a form is a new lexical entry to be added to Signbank.

(55)

GlossL	MOVE+2
GlossR	MOVE+2
MeaningL+R	friend moves away

For all classifier constructions, a translation must be made on the *Meaning* tier. The description of the classifier construction on the *Meaning* tier should be clear but compact. The following guidelines apply:

- Describe only what is expressed by the classifier construction.
- Describe the referent the classifier is referring to with a noun without any adjectives (e.g. 'kopje' *cup*, not 'klein kopje' *small cup*).
- Describe an action with an uninflected verb (e.g. 'lopen' *walk* and 'neerzetten' *put-down*).
- If the classifier shows an action as well as a referent, both are combined (e.g. 'rijden auto' *drive car*).

5.3.20. Shape constructions

Signs that are intentional expressions of shape and/or size of objects are glossed as SHAPE. These should not be confused with lexical signs (i.e. signs that have a fixed shape and a specialized meaning) that trace a shape, for example HOUSE or PIPE (as in (56), 2nd still). Lexical signs have their own ID-gloss in the NGT Signbank. Pointers to distinguish a Shape construction from a lexical sign that expresses a shape are:

- Shape: The signer intentionally conveys information about shape or size of an object;
- Shape: The signer looks at his/her hands while drawing the shape, as in (57) and (58);
- Shape: The signer uses a specific body posture or facial expression that modifies the meaning of shape construction (like furrowed eyebrows);
- Shape: The shape that is traced gives more detail about the shape of the referent than the lexical sign, as in (57) and (59); and/or
- Lexical sign: Both the form and the meaning are conventionalized and relatively invariable.
- Lexical sign: The signer mouthes the Dutch word while articulating the sign.

(56)

GlossL	ROPE-flat
GlossR	ROPE- flat
MeaningL+R	

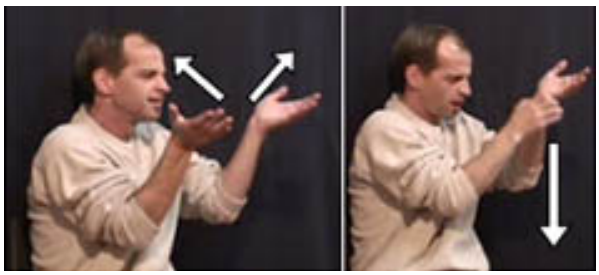
(57)

GlossL	RAIN-A	PIPE-flat
GlossR	RAIN-A	PIPE-flat
MeaningL+R	drain pipe^	^drain pipe

(58)

GlossL	SHAPE-RP+small-open
GlossR	SHAPE+small-open
MeaningL+R	electricity wire

(59)

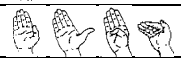
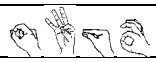


GlossL	SHAPE+ flat ----------	
GlossR	SHAPE+ flat	SHAPE+cylinder
MeaningL+R	upper part drain pipe	drain pipe

Note that, like for classifier constructions, these are pointers, and may not always provide sufficient means for the distinction. (See also the NGT Signbank guidelines for deciding on when a form is a new lexical entry to be added to Signbank.)

A Shape construction is glossed as a combination of the ID-gloss SHAPE, the shape of the articulator, and the (geometrical) shape of the referent. In case the construction is two-handed and one hand is held still while the other traces the shape the non-moving hand is glossed as SHAPE-RP (Reference Point). The referent of all Shape constructions is always specified on the *Meaning* tier.

For specifying the articulator shape used in these construction, we use the following codes:

Code	Forms	Code	Forms
1		**sphere**	
5		**closed**	
flat		**open**	
O		**small-closed**	
cylinder		**small-open**	

If another articulator shape than these is encountered, it can be added after agreement between annotators.

5.4. Summary of special symbols

Remark in general: do not use spaces in the glosses.

-	Separation of words and affixes in a gloss	WANT-NOT
_	Separation of elements of Classifier and Shape constructions	MOVE+1
+	Merged or combined signs	HOUR+1
-A, -B	Form variants	GLOSS-C
~	False starts	~GLOSS
:	Specifying direction of pointing signs	PT:1
?	Marking uncertainty about a specific gloss	GLOSS?
??	First annotator doesn't know this sign	??
???	None of us knows this sign	???
#	Fingerspelling	#VSO

*	Name signs	*JOHAN
^	Fixed combinations (on *Meaning* tier)	parents^ ^parents
!	Invisible, but likely a sign (out of video frame, behind other hand)	GLOSS!
±	Doubt as to whether this is a sign or not	±GLOSS
%	Gestures	%HEE
$	Proposal for a new gloss, to be discussed at an annotation meeting	$GLOSS

6. Phonetics of manual signs

A number of tiers are available to encode properties of the phonetic form of manual actions, whether lexical signs or other, non-lexical, activities. These tiers are at present not systematically used for all signs in all glossed files, but are used to encode phonetic properties of sign tokens (irrespective of whether or not they deviate from the supposed citation form), or to specify phonetic properties of non-lexical signs such as classifier constructions. Table 1 provides an overview of these tiers.

Table 1. Overview of phonetic tiers

Tier name (each for L/R, S1/S2)	Linguistic Type	Parent tiers	Controlled Vocabulary	Purpose
PhonetRed	*phonetic_reduction_dep*	*Gloss*	PhonRed {Lowered, Reduced}	Specifying lowered or generally reduced manual articulations
NOM	*phonetics_repetition*	*Gloss*	–	Number of movement cycles
Handshape	*phonetics_handshape*	*Gloss*	–	Phonetic properties of handshape
Orientation	*phonetics_orientation*	*Gloss*	–	Phonetic properties of orientation
Location	*phonetics_location*	*Gloss*	–	Phonetic properties of location
Movement	*phonetics_movement*	*Gloss*	–	Phonetic properties of movement
Transcr	*phonetics_transcription*	*Gloss*	–	A phonetic transcription in HamNoSys

7. Part of speech tagging

The *GrammClass* tiers containing a part of speech (POS) tag are not systematically used.

Part of speech or word category is seen as a prototype-based rather than a categorical matter. Signs, like spoken language words, are assumed to vary in the degree to which they are a 'noun', for instance, some signs being more nouny than others. The annotations on the POS tiers therefore specify the word category or categories of the particular token in that particular context, rather than repeat what might be listed in a lexical database as a possible category. This is similar then to the way the phonetic tiers are used in the Corpus NGT: they specify properties of the token in context, rather than of the citation form.

8. Two-handed activities and hand dominance

Our annotation schema for annotation of various properties of hand dominance will be described in detail in Crasborn & Sáfár (to appear). The description in the sections below is partly copied from this book chapter.

8.1. Overview of tiers

Table 2 provides an overview of the tiers used to describe hand dominance.

Table 2. Overview of tiers on hand-dominance

Tier name (each for S1/S2)	Linguistic Type	Parent tier	Controlled Vocabulary	Purpose
DomHand	*domhand*	–	DomHand	Phonetic hand dominance
DomRevPoint	*domrev_point*	–	DomRev_Point	Dominance reversal points, dominance at the start of a turn
DomRev Domain	*domrev_domain*	–	–	The domain created by a sequence of two reversal points (if any)
DomRev DomainType	*domrev_domaintype*	*DomRev Domain*	DomRev_Type	The function of the domain (if any)

8.2. Explicit coding of the dominant hand

The *DomHand* tiers for each signer (*DomHand S1*, *DomHand S2*) are used to specify whether the phonetic form of a sign is symmetric or asymmetric, and which of the two hands is dominant in a sign. The tiers are independent of the *Gloss* tiers, as the timing of the annotations needs to be independent of the timing of the glosses: it is a statement about the relation of glosses on the two tiers for the left and the right hand (or their absence on one tier). The annotation for DomHand classifies the linguistic activity at any point in time, irrespective of whether the hands articulate a standard lexical item, a morphologically complex form, a gesture, or fingerspelling. The Controlled Vocabulary that is linked to the Linguistic Type *domhand* is given in Table 3, and explained in the next paragraphs.

Table 3. Controlled Vocabulary *DomHand*

Value	Description
nd 1	No dominant hand; balanced sign
R 0	Right-dominant; one-handed sign
R 0 hold	Right-dominant; one-handed sign; accompanied by spreading of the non-dominant hand
R 0 sim	Right-dominant; one-handed sign; the other hand also articulates a sign at the same time
R 1	Right-dominant; balanced sign

R 2	Right-dominant; unbalanced sign with matching handshapes
R 3	Right-dominant; unbalanced sign with different handshapes
R 4	Right-dominant; different handshapes with both hands moving
L 0	Left-dominant; one-handed sign
L 0 hold	Left-dominant; one-handed sign; accompanied by spreading of the non-dominant hand
L 0 sim	Left-dominant; one-handed sign; the other hand also articulates a sign at the same time
L 1	Left- dominant; balanced sign
L 2	Left-dominant; unbalanced sign with matching handshapes
L 3	Left-dominant; unbalanced sign with different handshapes
L 4	Left-dominant; different handshapes with both hands moving
??	Unclear what happens, further inspection required

The classification that is made contains two parts: first, L or R specifies which of the two hands is dominant. The code 'nd' (no dominance) was used where neither hand could be identified as dominant (phonologically balanced signs with a symmetrical articulation). A height difference between the two hands in phonologically balanced signs was also considered an expression of hand dominance, with the hand at a higher position being identified as dominant. Likewise, a difference between movement intensity can also be interpreted as a sign of dominance.

Secondly, a phonetic classification of the type of (a)symmetry according to Battison's (1978) sign types is added. Where Battison used the types of sign in terms of their phonological specification, the distinctions he made lend themselves equally well to the phonetic realisation of signs. Type 0 signs are one-handed, without any discernible linguistic activity of the other hand. This code is also used for two-handed simultaneous constructions that cannot easily be analysed as forming one morphologically complex word, but are simultaneous realisations of two (phonetically) one-handed signs; in such a case, the addition 'sim' for simultaneous construction is added. In addition, 'sim' is used for two one-handed signs that happen to overlap but which cannot be analysed as a simultaneous construction. In the screen shot in Figure 2, for instance, the signs PT (a pointing sign) and CI-A (one of the signs meaning 'cochlear implant' are realised simultaneously, without the two forming a single lexical unit, and they were therefore annotated as 'L 0 sim' and 'R 0 sim', respectively.

In Type 1 signs, both hands move and the handshapes are similar. Unlike their phonological siblings, however, phonetic forms of Type 1 can be articulated asymmetrically if one hand is higher in space than the other. Asymmetries in the articulation of handshape or orientation are not taken into account. As Type 1 signs are the only signs that can be fully symmetric, 1 is the only sign type classification that can follow the 'nd' code. However, as mentioned above, a dominant hand can be identified for type 1 signs, in cases of height or movement asymmetries.

In unbalanced signs, only one of the hands move, thus hand dominance is easily identified. Based on whether the handshapes are the same or not, signs can be classified as Type 2 (phonologically identical handshapes) or Type 3 (phonologically different handshapes). Type 4 signs are articulated with different handshapes and both hands moving. While these signs are exceedingly rare in the lexicons of sign languages described so far, they do occur, both as lexical signs and as phonetic forms that may be due to sign production errors or assimilation. In these cases hand dominance may be identified based on the more marked handshape.

Aside from the addition 'sim' for simultaneous constructions after the dominant hand code and the sign code, the code 'hold' may be used following signs of Type 0, when spreading of the non-dominant hand accompanies a one-handed sign on the other hand. It will be the other hand that is dominant in such a case.

8.3. Coding of changes in hand dominance

In principle, changes in hand dominance are derivable from the annotations on the *DomHand* tier by finding neighbouring annotations with different hand dominance. However, the DomHand annotations are relatively time-consuming to make, because for each individual sign or other hand action, a number of decisions have to be made. To be able to rapidly annotate dominance reversal in a larger data set, we created two further tier types for the annotation of dominance reversals. 'Dominance reversal point' tiers are used for annotating switches of hand dominance, while 'dominance reversal domain' tiers contain annotations corresponding to a series of signs articulated with reversed dominance. Finally, a third tier type is used to annotate functional characteristics of dominance reversal domains.

8.3.1. Dominance reversal points

The point in time when the dominance reverses from one hand to the other is annotated on the *DomRev Point* tiers, one for each participant (*DomRev Point S1*, *DomRev Point S2*). In order to save time during annotation, we only use the criterion of movement vs. no movement for establishing hand dominance. Hand height is thus not taken into account. The reversal point need not necessarily have the previous sign as its reference. If the preceding sign is fully symmetrical, the last asymmetric sign before that in the same turn is used as the reference. The annotation is placed at the reversing sign. The duration of the annotation is not strictly controlled in the guidelines; again, the aim here is to allow for rapid annotation of large amounts of video data.

To enrich the point annotations and make them more useful for other types of research, we specified what the dominant hand at the start of a turn was. Also, we try to differentiate longer turns from short manual backchannelling, although this distinction remains a matter of intuition for annotators. By encoding the start and end of turns, reversals within and across signing turns can be distinguished, as well as dominance reversals within short feedback-like segments from dominance reversal during a longer stretch of discourse. At the start of a turn, an annotation is created that specifies which hand is dominant hand when signing starts. Even if it only becomes apparent after one or more signs which hand is dominant, as the first signs in the turn are all fully symmetric, the annotation is still placed at the start of the turn. An annotation at the end of the last manual sign of the turn specifies the turn end, without explicitly coding the dominant hand: this information is always available in the previous annotation.

Without using any theoretical sophistication, annotators are further required to distinguish longer utterances of a signer that could be characterised as a turn (potentially overlapping with the turn of the other signer) from short feedback-like signals or backchannels that appear to only briefly respond to the other signer, for maximally five manual signs in sequence. Here too, the dominant hand at the start and the end of the feedback signal is annotated as well as any reversals within those boundaries. The boundary between a longer turn and a short backchannel is not always easy to make, but typically feedback signals are short and contrast with the continued signing of the interlocutor.

The Controlled Vocabulary *DomRev_Point* that is linked to the Linguistic Type *domrev_point* is presented in Table 4.

Table 4. Controlled Vocabulary *DomRev_Point*

Value(s)	Description
TL, TR	The left (L) or right (R) hand is dominant at the start of the turn
TE	The turn ends
FL, FR	The left (L) or right (R) hand is dominant at the start of the feedback sequence
FE	The feedback sequence ends
LR	Dominance reverses from left to right
RL	Dominance reverses from right to left
T?	Turn starts but dominance is unclear
F?	Feedback starts but dominance is unclear
??	Unclear what happens, further inspection required

Dominance reversal is thus explicitly coded when it is within a turn (as 'LR' or 'RL'), but it is annotated as a sequence of annotations when it occurs between turns or between turns and feedback signals (e.g. TL-TE-TR, RL-TE-TR).

8.3.2. Dominance reversal domains

While the tiers for dominant hand and dominance reversal point look at the dominance reversal from a phonetic point of view, and can therefore be annotated with relatively little signing skills, the tiers described in this section require a linguistic understanding and analysis. The assumption is that a signer may reverse dominance for a brief while for a specific linguistic purpose or another specific reason, and that this can be marked as a domain with a start and an end, after which dominance returns to the 'default' state (Frishberg 1985). This default dominance in a given movie need not necessarily coincide with the preference hand, however, and in fact it is not relevant for these annotations which of the two hands is the signer's preferred hand. Aside from the fact that not everyone is clearly left- or right-handed (see Sáfár 2012), signers may well use their non-preference hand as the dominant hand in a specific short clip in our corpus. The 'default' dominance is therefore the hand that is dominant in a specific clip until the dominance reversal occurs.

The *DomRev Domain* tiers (*DomRev Domain S1*, *DomRev Domain S2*) serve to delineate the duration of a dominance reversal domain. There is no Controlled Vocabulary, and the content of the annotation may be used for observations or comments about the domain, such as first impressions of the function or grammatical status.

8.3.3. Functional classification of the dominance reversal domain

The *DomRev Domain Type* tiers are child tiers to the *DomRev Domain* tiers. The Linguistic Type *domrev_domain_type* has the stereotype Symbolic Association in the ELAN template, which means that the annotations are linked one on one to the parent annotations, and the start and end times of the annotation are determined by the parent annotation. The Controlled Vocabulary *DomRev_Domain_Type* distinguishes a variety of functions of dominance reversal as well as other factors that are potentially related to the occurrence of dominance reversal. Table 5 lists the different types currently distinguished in the vocabulary, with reference to first mentions in the literature for each category.

Table 5. The Controlled Vocabulary *DomRev_Domain_Type*

Value	Description
Interaction	The other hand becomes dominant for the expression of feedback to the interlocutor or to manage the conversation
Parenthesis	The other hand expresses background information or interjections
Buoy	The dominant hand becomes the non-dominant hand if it is held as a buoy
Conjunction	First one hand and then the other hand express two conjoined phrases
Cause–effect	One hand signs the cause or the effect of what the other hand has produced
Contrast	The two hands express semantically contrasting concepts of a similar morphosyntactic nature
Topic-comment	A topic-comment sequence that is separated by dominance reversal
Direct speech	The other hand becomes dominant to produce direct speech related to the preceding indirect speech
PT real space	The other hand becomes dominant to point to something in real space
PT signing space	The other hand becomes dominant to point to something in the signing space
Location in signing space	The other hand becomes dominant to produce a sign on that side of the signing space
Interlocutor-directed	The other hand becomes dominant to sign to someone standing on that side of the signer
Phonetics	Dominance is reversed for reasons of articulatory or perceptual ease
A specific sign	A specific sign that is always produced with reversed dominance by a specific signer
Contact	The previously dominant hand is used for non-linguistic purposes and the other hand becomes dominant
Other	Reason for dominance reversal is unknown or does not fall into any of the other categories
??	Unclear what happens, further inspection required

Another type that is listed by Frishberg (1985) with hypothetical examples is dominance reversals for groups of unbalanced signs that share a specific phonological feature, such as 'circular movement'. As we did not come across many instances of individual signs that are reversed, we did not include this possibility. If large numbers of items for the value 'A specific sign' are found, one can always try to look for phonological patterns afterwards.

The present vocabulary is likely to be adapted as our research progresses, with expected deletions as well as additions. It has served as a first classification of the frequent dominance reversals in the Corpus NGT, which forms the topic of on-going investigations of the phonetics, morphosyntax, and discourse structure of NGT.

9. Mouth

Various aspects of the articulator 'mouth' are transcribed and annotated on a set of tiers that are discussed in detail in Crasborn & Bank (2014), some of which is repeated below.

9.1. Overview of tiers

The tiers listed in Table 6 are further discussed in the sections below. Although no controlled vocabularies are presently specified in the EAF files, it would be best to create a CV for the *MouthType* tiers in the future.

Table 6. Tiers used for transcribing and annotating mouth actions

Tier name (each for S1/S2)	Linguistic Type	Parent tier	Controlled Vocabulary	Purpose
Mouth	*mouth*		–	Transcription of mouthings in Dutch orthography
MouthLemma	*mouth_lem*	*Mouth*	–	Dutch lemma of which the mouthing is an instance
MouthType	*mouth_type*	*Mouth*	–	Type of mouth action
MouthSpr	*mouth_spr*	*Mouth*	–	Spreading of the mouth action
MouthSyll	*mouth_syll*	*Mouth*	–	Number of syllables of the mouth action
MouthAdd	*mouth_add*	*Mouth*	–	Additional meaning of the mouth action

9.2. Transcription of mouth actions

Mouth action transcriptions are made on a tier called '*Mouth*'. Articulations that are perceived as being (fragments of) spoken language words (mouthings) are written in lowercase without any special markers. All other mouth actions (any type of mouth gesture) are put between single quotation marks ('…'). If a mouth gesture cannot be easily described in terms one or more spoken language segments, we use a phonetic description of the mouth articulation between pipes (|…|).

Acoustic correlates of the mouth action such as phonation are not annotated. We acknowledge that for studies on code mixing, for instance, this could be important information. We suggest that this type of information could best be annotated on a separate tier, with conventions to be established in accordance with the purpose of a specific research goal.

As on other tiers used in the Corpus NGT, uncertainty about the correct representation can be labelled with a single question mark following the transcription. As with manual signs, false starts are prefixed with a tilde symbol (~).

Especially in the case of mouth gestures, the nature of the transcriptions will be influenced by the research findings on this topic for the language at hand (whether in linguistic publications or implicit in dictionary representations or teaching materials). While consistency will be difficult to achieve in the absence of a vocabulary of mouth gestures, the creation of such a vocabulary can be the result of multiple revisions of the set of transcriptions created by a variety of annotators in a first annotation pass. The ECHO conventions for mouth gestures referred to above may serve as a basis for this, but are in need of an evaluation and possibly adaptation, as they have never been used for a large-scale corpus, as far as we know.

9.3. Lemma

As was already referred to above, the *MouthLemma* tier is a child tier of the transcription of the *Mouth* tier, and is the place where the presumed uninflected lemma can be notated of which the observed mouthing is an instance. By using a lemma rather than a full (inflected) form of the spoken word, we stay clear from any overinterpretation of (the morphological specificity of) the mouthing.

The lemma information allows for the searching for mouth actions based on a spoken word type, and will thus facilitate the extraction of various instantiations of the word, whether inflected or not inflected and no matter how reduced or repeated (see section 2.4 below) a Mouth token may be. For this reason, it would be advisable to include a lemma annotation for all mouth annotations, also when they do not differ.

9.4. Classification

On the tier *MouthType*, we classify the mouth action transcribed on the *Mouth* tier. We adopt the five-part classification proposed in Crasborn et al. (2008), distinguishing the following categories:

M	Mouthing: a (fragment of) a spoken language word
E	'Empty' mouth gesture: a lexicalised phonological component of a sign that is not derived from a spoken word
A	Adverbial mouth actions, lexicalised independently of a manual sign
4	'Mouth for mouth' actions: instances where the mouth represents the mouth (as in pantomiming drinking or chewing)
W	Whole-face actions that include a specific mouth articulation, as in affective facial expressions

In addition to these five main types, the Mouthing category is further specified into five subtypes:

M	Regular mouthing
M-back	Mouthing used as backchannel signal
M-add	Mouthing that is not related to a manual sign but temporally overlaps with manual signs.
M-solo	Mouthing that does not overlap with manual signs
M-spec	Mouthing that is co-articulated with a manual sign that serves to specify the semantics of the manual sign

This latter subdivision has arisen in the context of our investigations into NGT mouthings, briefly discussed in section 4. A similar investigation into mouth gestures is likely to lead to a further specification of the four types of mouth gestures listed in Figure 2 (see e.g. Sandler's (2009) category of 'iconic mouth gestures').

9.5. Phonetic properties

Two types of phonetic properties are encoded each on their own tier. First of all, the alignment of the mouthing with the manual glosses is characterised on the *MouthSpr* tier ('Mouth spreading', following the description of spreading as a prosodic process in Sandler, 2006). As in feature spreading in spoken language segmental phonology, spreading refers to the phenomenon that certain articulatory features may be lengthened to co-occur not only with their source, but also with neighbouring elements. In the case of spreading mouthings, mouthings that have a clear 'source' sign with which the mouthing semantically overlaps are articulated in such a way that they also overlap with the preceding or following sign(s).

The annotation on the *MouthSpr* tier contains information on the glosses that overlap with the mouth annotation. Angled brackets are used to encode the direction of spreading (< for regressive, > for progressive). For example, the MouthSpr annotation 'BIER > DRINKEN', together with the Mouth annotation bier 'beer', means that the mouthing that accompanies the manual sign BEER is either lengthened or maintains it final state so long as to also cover the manual sign DRINKEN 'to drink'. Signers are usually not maximally synchronised in their articulation of sign/mouth pairs, so MouthSpr annotations should not be applied every time that there is a single-frame difference in start or end, irrespective of the duration of the actions and/or the signing speed, for instance. In our own investigations, a mouthing is categorised as spreading over an adjacent sign when it overlaps that sign with at least 50% or 10 or more video frames, whichever applies first.

A second type of phonetic information can be encoded on the *MouthSyll* tier. It is used to specify the number of syllables of the observed mouth articulation. For mouthings, the number of syllables of the visible word would be transcribed, while for mouth gestures, if countable, the number of cycles of the articulation would be encoded. We have not yet used this tier for our ongoing investigations, but it is devised to study the alignment of manual and oral actions. There are cases in our data where the first syllable of mouthings is reduplicated, seemingly to correspond to the number of movement cycles (syllables) in the manual sign. To investigate the hypothesis that 'the hand drives (the prosody of) the mouth', systematic annotation of the MouthSyll together with the number of movements on the 'NOM' tier (a child of the gloss tiers in the Corpus NGT) will be needed.

9.6. Semantics

While in our data most mouthings appear to be clearly linked to manual signs both in terms of their semantics (typically overlapping with, if not equal to, that of the sign) and in terms of their timing (typically being co-articulated), there are also mouthings that cannot be analysed as linked to a manual sign. We call these 'added mouthings', as they add an element to the semantics of the whole utterance (rather than specifying the semantics of an individual sign). Solo mouthings (specified as such on the *MouthType* tier, see Figure 3), have the same function as added mouthings but do not overlap with manual signs. They occur often at the start or end of a signed phrase, before the signing starts or after the signing has ended.

In order to efficiently analyse these utterances, the annotations on the *MouthAdd* tier consist of a string of manual glosses (ignoring differences between one-handed and two-handed signs and various types of two-handed constructions) followed by a string of mouthings.

Although these annotations are made on sentence level or phrase level, they can still be rather short. For example, utterances like *BEGINNEN begin maar* 'START start go-ahead' are not uncommon.

10. Other non-manuals

With the exception of head shakes, no systematic transcription or annotation of other non-manuals than the mouth has been made. However, since non-manuals play an important role in sign language utterances and interaction, for future use of the corpus we foresee that many different non-manual features will be relevant in studies using the Corpus NGT. To facilitate use of the corpus and to promote systematic annotation of different features, a large set of tiers has been made created for different types of articulations that can be used for transcription. These are listed in Table 7.

Table 7. Tiers for transcription of non-manual activities

Tier name (each for S1/S2)	Linguistic Type	Parent tier	Controlled Vocabulary	Purpose
Body movement	*nm_body_mov*	–	–	Transcription of the movement of the torso
Body position	*nm_body_pos*	–	–	Transcription of the position of the torso
Head movement	*nm_head_mov*	–	–	Transcription of head movement
Head position	*nm_head_pos*	–	–	Transcription of the position of the head
Face	*nm_face*	–	–	Characterisation of the overall (affective) facial expression
Eye brows	*nm_brow*	–	–	Transcription of the eye brow position
Eye aperture	*nm_blink*	–	–	Transcription of the aperture of the eyes, incl. eye blinks
Eye gaze	*nm_gaze*	–	–	Transcription of eye gaze direction
Nose	*nm_nose*	–	–	Transcription of the activity of the nose

11. Observations

Any observation can be entered as free text on one of the observation tiers that have been created for all present RU users (including annotators) of the corpus. The tier names have the format *Obs_Firstname*, and share the Linguistic Type *remarks*. It is recommended that these annotations are kept fairly short (not more than a few seconds), even if the observation concerns a longer stretch of discourse, so that multiple observations can be added over time. The time selection to which the observation applies can be added in the text: 'In the next three sentences/twenty seconds/...., X appears to do Y'.
Where possible, observations about forms and functions of utterances should be annotated on the general tiers dedicated to the phenomenon, taking into account the conventions that apply to those tiers.

12. Administrative information

A few tiers are used to sore metadata and metadata-like information on specific sections of the corpus in the annotation files, to facilitate exploitation of the corpus. Some of these could perhaps in the future be replaced by the new 'Comments' function that will appear in ELAN in late 2014.

12.1. Gloss correction

The *GlossCorrection* tier (Linguistic Type: *remarks*) is used to signal possible glossing errors, and to make suggestions for glosses that might apply.

12.2. Stimuli extracted from the corpus

The *UsedAsStimulus* tier (Linguistic Type *remarks*) can be used to annotate segments of the corpus that have been used as a stimulus for other studies. This was used in the SignSpeak project on automatic translation for instance to select sentences that subjects had to repeat or rephrase in front of the camera.

12.3. Examples

Examples that are cited in publications can be annotated on the *Example* tier (Linguistic Type *example*), so that source data related to research publications can be easily searched and found in online releases of the corpus.

The duration of the annotation should match the length of the example. The format of the annotation should be 'Author(s) (year). Title, Journal, figure/example x, caption'. An example:

(60) Bank, Crasborn, & Van Hout (2011). Variation in mouth actions with manual signs in Sign Language of the Netherlands (NGT). Sign Language & Linguistics 14(2), example 1: a case of lexico-semantic variation in mouthings.

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