

# Signing thoughts!

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A methodological approach within the semantic fieldwork used for coding nonmanuals which express modality in Austrian Sign Language (ÖGS)

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## Abstract

Signing thoughts gives the possibility to express unreal situations, possibilities and so forth. Additionally, signers may express their attitude on these thoughts such as being uncertain about an imagined situation. We describe a methodological approach within the semantic fieldwork which was used for identifying nonmanuals which tend to occur in thoughts and which may code (epistemic and deontic) modality in Austrian Sign Language (ÖGS).

First, the process of recording short stories which very likely include lines of thoughts is shown. Second, the annotation process and the outcome of this process are described. The findings show that in almost all cases the different annotators identified the same non-manual movements/positions and the same starting and ending points of these nonmanuals in association with the lexical entries. The movement direction was allocated to one direction of the three body axes. Furthermore, some nonmanuals were distinguished due to intensified performance, size of performance, speed of performance, additional movement components, or additional body tension. Finally, we present nonmanuals which frequently occur in signed thoughts. These include various epistemic markers, a deontic marker, indicators which show the hypothetical nature of signed thoughts, and an interrogative marker which differs from interrogative markers in direct questions.

**Keywords:** nonmanuals, signing thoughts, (epistemic and deontic) modality, Austrian Sign Language

## 1. Expressing modality<sup>1</sup> by signing thoughts

Expressing thoughts is an excellent way of abstracting away from the here and now. Using this way of expressing oneself gives the possibility to speak/sign about unreal situations, wishes, possibilities, conditions and so forth. When doing so, also attitudes on these thoughts such as being certain or uncertain of the realization of a situation can be expressed.

We present a methodological approach for producing, identifying and analyzing nonmanuals which code (epistemic and deontic) modality, implemented in the framework of semantic fieldwork<sup>2</sup>. Phase 1 comprises the implementation of producing a type of signed context in which frequently non-manual means for coding modality occur. Phase 2 includes the process of identifying these nonmanuals by Deaf annotators. In Phase 3 these elements are analyzed with regard to their context of occurrence and their co-occurrence with other (non-manual) elements.

## 2. Producing signed thoughts

In Phase 1 the Deaf informants were asked to sign a longer action, e.g. hiking or driving. Furthermore, they were told that during this longer ongoing action they should think about a certain situation and wonder whether this or that situation will/would occur or to express possible conditions about the imagined situation. These trains of thoughts were then expressed with different

attitudes or knowledge about the imagined situation such as being unaware of certain circumstances in this situation, being uncertain about the occurrence of a situation, being full of hope that the imaginations will come true and so on. The instruction was given twice, once by a video in which a Deaf lecturer described the task and once by a Deaf participant who coordinated the video recording process and who constantly guided the Deaf informants through the task. After giving the instructions, informants were asked to sign informal stories as a kind of warming up. After about 10-15 minutes, they were asked to sign stories which should also include trains of thoughts. The recordings were implemented in sitting and standing position. The Deaf informants were instructed to sign in standing position and afterwards to repeat (in general) signed contents while sitting. The narrations (longer and shorter stories) had to be signed twice in the particular positions.

As the recordings took place in the informants' Deaf club, a location with which the informants are very familiar, the following situation occurred: The part of the club where the recording took place was just one of the various places in the Deaf club, where the participants were busy signing. Thus, being visible to the others resulted in being watched by the other club visitors for a while or being interrupted by the others; also the signers who were doing the recordings started to chat with others and then continued signing for the camera. To be precise, the recording location was just one 'scene of communication' in the Deaf club and consequently, a well-ordered production of stories including lines of thoughts expressed with the first attitude on these thoughts, the second attitude on these thoughts and so on did not take place. However, compared to recording in a studio, this situation offered the possibility to record a very natural way of signing.

After analyzing the recordings, the outcome shows that six out of nine informants really produced lines of

<sup>1</sup>The term 'modality' is used, as it refers to the semantic domain while the term 'mood' is avoided as it is mostly associated with grammatical categories like indicative and subjunctive.

<sup>2</sup>An introduction/description on methodology in semantic fieldwork is given by Matthewson (2004).

thoughts while signing short stories. When producing thoughts, a topic was chosen (e.g. hiking in the mountains) to which different short stories were signed. Before telling the outcome of the story, these short stories included lines of thoughts. Furthermore, the data show that the participants were inspired by the topics being produced by the other signers such as going hiking and visiting a hut, playing cards, and so forth. Thus, the positive effect of being visible to the other informants was that the instructions were clear to most of the informants and the contents of the signed texts were quite similar. This resulted in data which was excellent to compare with each other. For instance, a scenario which was signed by all participants was that somebody is hiking and thinking about a hut which might be open or closed. This scenario was then expressed with different attitudes on this situation such as wondering, being certain, or being uncertain whether the hut is open or closed.

What is more, the recordings show that the various informants did not produce the same order of stories as the proceeding informant, nor the same kind of thoughts. So, they produced in their lines of thoughts declaratives, interrogatives and conditionals as well as various epistemic modalities in highly diverse orders.

To conclude, this procedure guaranteed us that the productions from the various informants were not strongly biased from previous signers' expressions as it is very unlikely that an informant remembers the exact non-manual configuration used to express one of the types of epistemic modality after a 20-30 minutes recording session produced in such an interactive setting.

With regard to data, the entire recordings last five hours in total. From these recordings 40 minutes were annotated by four (partly five) Deaf annotators. These annotated recordings include short stories in which six informants expressed their thoughts.

### 3. Identifying nonmanuals occurring in signed thoughts

In Phase 2 the recordings were annotated in ELAN<sup>3</sup> by four (partly five) Deaf annotators. To be precise, the signs were glossed by the first annotator. Afterwards each communicatively relevant non-manual element was described with regard to its form and meaning/function in the particular context by four/five annotators per recording. The template for the annotators included a tier for each non-manual articulator which may code communicatively relevant information. In sum, besides the parameters gloss-left-hand and gloss-right-hand the template included tiers for coding mouth movement(s)/position (including a separate tier for 'mouthing' and 'mouth gesture'), eye gaze movement(s), eye aperture and eye brow position/movement(s) and facial movement(s)/positions. With regard to the articulators head and body, each communicatively relevant instance of head position or movement(s) and body position or movement(s) along a body axis was annotated in separate tiers. The set of head and body tiers

included: tilt-forward/backward, chin up/down, head tilt-right/left, head turn-right/left, head rotation/etc.; body turn-left/right, body lean forward/backward, body lean-sideward/sways/shifting of weight/step, shoulder(s)/body straitening-up.

When doing the annotation the Deaf annotators were instructed to identify the nonmanuals' characteristics which are:

- the kind/sequence of motion –i.e. whether the particular non-manual element is/are movement(s) or a position of a particular articulators,
- the exact beginning and ending points of these non-manual means
- the direction of motion for this non-manual element (e.g. positioning the head forward versus positioning the head backward)
- the intensified performance, the size of performance and/or the speed of performance of the identified non-manual element, if relevant for the annotator
- additional co-occurring factors such as the degree of body tension or additional movement components, if relevant to the annotator
- and the current possible meaning of the identified non-manual element in the particular context.

In order to compare the annotations of the different annotators, each of them got a separate list of non-manual tiers. When annotating, the annotations of the others were concealed, only the glossing tier was visible to everyone. This process resulted in at least four different annotations of the various non-manual tiers which were compared afterwards as illustrated in Figure (1).

Figure (1) shows an example of the annotated data. For reasons of clarification, the annotations of each of the four Deaf annotators (A to D) are edged red, green, blue and yellow. It is shown that the annotators identified the same movement/position (here the marker 'head forward; encircled red) as well as the same starting and endpoint of the non-manual element (encircled green). Also their descriptions of the semantic meaning of these elements were quite similar.

All nonmanuals which were identified by at least three of the four (partly five) annotators were taken for the analysis. To be precise, nonmanuals which had an inter-annotator agreement of at least three annotators were adduced as instanced for the analysis<sup>4</sup>.

In conclusion, the striking outcome of this procedure was:

- First, in almost all cases the different annotators identified the same non-manual movements/positions. For instance, as shown in Figure (1) all annotators identified the same distinctive marker – i.e. 'head forward'.

<sup>3</sup><http://tla.mpi.nl/tools/tla-tools/elan/>

<sup>4</sup>As the focus of this investigation was the identification of nonmanuals which had been unknown so far and as for this research human resources were limited, the statistic evaluation is limited to general data information.

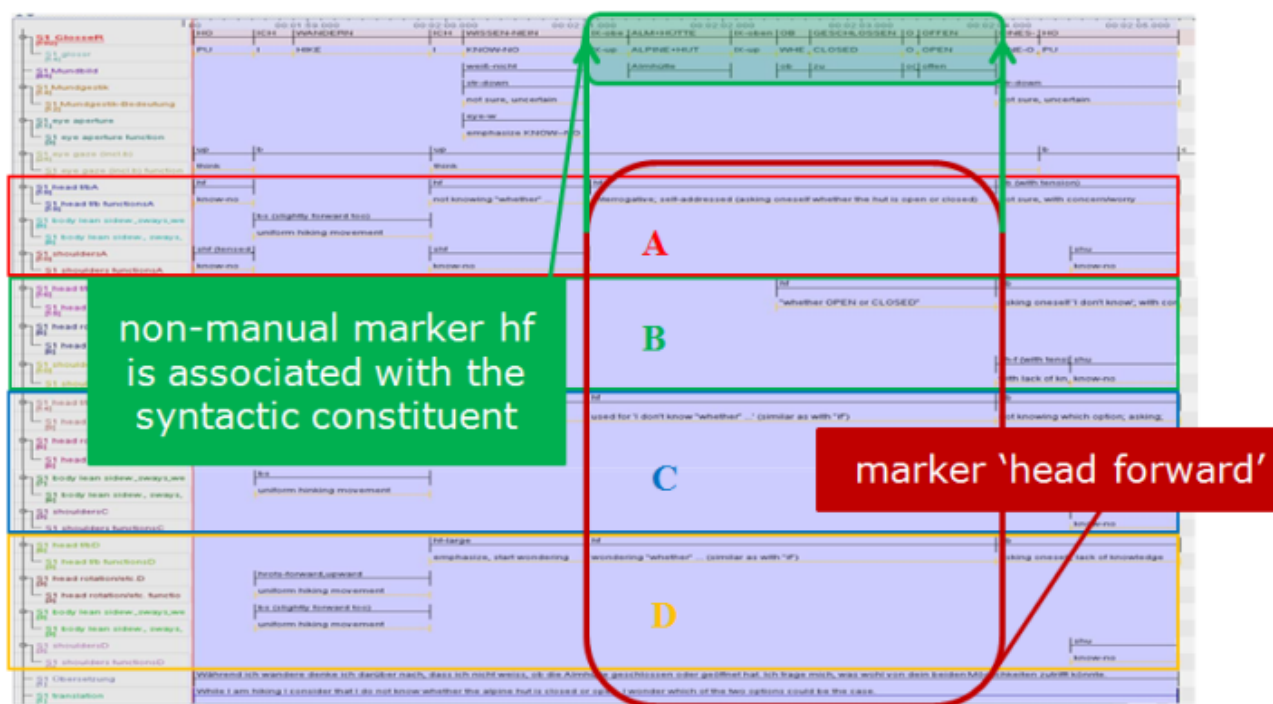


Figure (1): Identified non-manual marker ‘head forward’, associated with the syntactic constituent by annotator A, B, C and D (Lackner 2013, 70)

- Second, in the majority of instances the annotators determined (not influenced by each other) the same starting and ending points of these non-manual movements/positions in association with the lexical entries. This result shows that there must be a high tendency in sign languages (SLs) of alignment between non-manual components with lexical entries, which they associate to with regard to the production but, most notably in the perception of the signing flow. Also, the annotated ÖGS-data show that a variety of these nonmanuals are associated with the syntactic constituent, as illustrated in Figure (1).
- According to the annotators’ feedback, each non-manual element showed the following characteristics: The kind/sequence of motion was perceived as ‘movement’ or ‘position’ (e.g. constantly forward movements of the head versus positioning the head forward). The direction of motion was in the majority of cases distinguished by a contrast of movement/position (e.g. positioning the head forward versus positioning the head backward). Some nonmanuals were distinguished due to intensified performance or the size of performance (e.g. positioning the head forward versus positioning the head forward in an intensified way, or producing headshakes with a small radius versus headshakes with a large radius), the speed of performance (e.g. producing fast headshakes versus producing slow headshakes), the degree of body tension (e.g. producing non-tensed headshakes or performing head nods in an trembling way with a tensed body), and an additional movement component (e.g. head nods with trembling movement or headshakes with alpha-movement).

All these new insights were implemented in our annotation conventions. In brief, when annotating nonmanuals, first, an abbreviation of the articulator is given (e.g. ‘h’ for the head). Second, the direction of movement is added (e.g. ‘hf’ for head positioning forward). Third, additional information is attached with a hyphen (e.g. ‘hf-large’ for positioning the head forward in an intensified way). Also, the information whether the identified element is a position or movement(s) is attached, if that information is of relevance for the annotator (e.g. ‘hn’ for a single head nod while ‘hns’ for several nodding movements). What is more, we realized that with articulators such as the head and the body more non-manual elements could co-occur. For instance, it is possible to produce nods together with putting the head forward and tilting the head to the side. The annotators allocated to all of these co-occurring movements/positions of the head a certain meaning/function. This finding resulted in creating a template for ELAN which includes for each possible direction of movement of the head and body a separate tier.

#### 4. Analyzing nonmanuals occurring in signed thoughts

Related to analyzing signed thoughts (Phase 3), the most striking finding was that the annotated data showed that various nonmanuals are used for coding modality. Using modal verbs for coding modality (both deontic and epistemic modality) has been described for other Sign Languages (SLs) (Wilcox & Shaffer 2006 in American SL or Pfau & Quer 2004 in German SL and Catalan SL). Non-manual elements (face, head, body) that can co-occur with these modality verbs have been described to some extent as well. Also, modal particles occurring in



Figure (2): Signed thought in ÖGS

SLs have been described (Hermann 2013, for German SL).

Our data show that in ÖGS a second modality system exists which comprises nonmanuals used to code modality. First, this is a set of non-manual markers which are used to code epistemic modality. They serve to mark the signer's knowledge and/or degree of confidence of the true value of a proposition and are labeled by Lackner (2013, 324-347): assertive marker, non-assertive marker, dubitative marker, and trembling marker. Second, the annotations show that a head marker which is also used to show contrast or alternatives, is used to express deontic modality. To be precise, tilting the head to the side is used to express the possibility/probability of realization of an imagined situation. Third, there are further means (most of them are nonmanuals) which also frequently occur when expressing unrealized thoughts or when wondering about an unreal situation. These are different indicators which refer to a higher place in the signing space, labeled as 'hypothetical space' (Lackner 2013, 260). These elements (co-)occur in the initial position of the thought or co-occur with the entire thought. These are indexing (pointing) upward, gaze-up, chin-up and displacement of the sign's place of articulation into a higher signing space. Moreover, the data show that an interrogative marker which is different to the interrogative markers used in direct questions or constructed dialogues occurs when wondering about an imagined situation. Interestingly, the same head marker is used as conditional marker by all informants. Finally, there are other non-manual markers which also frequently occur in signed thoughts, but which require further investigations. First, the marker 'squinted eyes', which is frequently associated with knowledge or lack of knowledge by the various annotators, needs to be looked at more closely. The second identified non-manual marker is 'wrinkled nose' which occurs in the majority of conditionals which include negativity. According to the annotators' feedback this marker might express the negative attitude on an imagined situation.

Some of these indicators which code modality meaning in ÖGS are shown in the following Figure (2).

Figure (2) shows a line of thought in which the signer wonders whether the shop will be open and whether there will still be time to go shopping. This is followed by showing the signer's uncertainty, expressed by the mouth action 'closed mouth, lips stretched, corners slightly go down' (encircled blue). The indicators referring to the 'hypothetical space' are looking and indexing upward, both produced in the beginning of the line of thought (encircled red). The questionability/interrogativity of the entire utterance is expressed by positioning the head forward (encircled green), in an intensified way while signing CAN BUY (encircled green in bold), co-occurring with winkled nose which might express the negative attitude on the probability of realization this imagined situation.

## 5. Conclusion

To sum up, our study shows a methodological approach used to identify various indicators which code modality meaning in ÖGS.

To begin with, our solution for receiving recordings which comprise various means of coding (epistemic and deontic) modality was to let the signers express their thoughts by signing a short story. Embedding signed thoughts in short stories as well as offering a familiar atmosphere (where the informants could see each other) was the right setting to get data which contains a lot of information coded by nonmanuals and various elements which code modality meaning.

Then, we instructed all Deaf annotators to identify the nonmanuals' characteristics such as the kind/sequence of motion, the exact beginning and ending points of these non-manual elements and so on. In doing so, we gained the insights that the different annotators identified the same non-manual movements/positions, the same starting and ending points of these non-manual

movements/positions in association with the lexical entries, and further characteristics of these non-manual elements such as size or speed of performance.

Our findings show that in ÖGS various nonmanuals exist which express modality meaning. In particular epistemic modality is coded by various non-manual markers when signing thoughts. The findings also show that there are other nonmanuals which frequently occur in signed thoughts such as indicators for expressing the hypothetical nature of thoughts or an interrogative marker which differs from interrogative markers used in direct questions or constructed dialogues.

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