Chapter 3
Non-manuals in Sign Languages – Theoretical Background

Although it is a common belief that sign languages use the hands instead of the mouth for communication, this is only partly true. Pfau and Quer (2010) call this “one of the common misconceptions about sign languages”. An expanding body of research on the various functions of non-manual markers in different sign languages since the 1980s (e.g. Coulter 1979; Woll 1981; Engberg-Pedersen 1990; Sandler 1999; Sutton-Spence & Woll 2006; Pfau & Quer 2010) has proven this statement to be wrong. Apart from the hands, other articulators such as the body, the head and different parts of the face are equally important for sign language communication. Thus, linguistically significant elements which are expressed by any articulator other than the hands are called “non-manual markers” or “non-manuals” (Pfau & Quer 2010). These non-manual markers encode various kinds of grammatical information as well as prosodic features such as intonation (Sandler & Lillo-Martin 2006; Sandler 2012). These grammatical non-manuals have to be distinguished from purely affective non-manual markers such as brow raises for surprise. These affective non-manuals are not the subject of this chapter. In figure 3.1 below, the hierarchy of grammatical non-manuals after Woll (2001:88) can be seen.

Figure 3.1 Hierarchy of non-manuals
As shown in Figure 3.1, non-manuals can generally be distinguished into those produced by articulators such as the eyes, the head or the body. These are thus not related to actions performed by the mouth. In the following, both types will be described concerning their function(s). While the first part of the chapter elaborates on non-mouth related actions by the eyes (3.1.1), the face (3.1.2 and 3.1.3), the second part (3.2) discusses mouth actions which are the focus of this book.

3.1. Non-Mouth Related Non-Manuals

As mentioned in 3, the current subchapter discusses the functions, i.e. grammatical, lexical and prosodic roles of non-manual markers produced by articulators other than the mouth. These are eye gaze, facial expression and its functions on the lexical, syntactic and prosodic level, and finally head movements such as headnods or headshakes. In line with Sandler (2012), non-manuals are not seen as a coherent linguistic category but as operating on different (linguistic) levels, be they prosodic, syntactic, lexical or pragmatic.

3.1.1. Eye Gaze

Eye gaze in sign languages has many important functions on several linguistic levels. As opposed to most of the other non-manuals, it does not fulfill prosodic functions, however (Sandler 2012). Sutton-Spence & Woll (2006:94) report at least five functions of eye gaze in BSL:

[... ] at the phonological level for lexical distinctions; in conjunction with the location and movement of referents in space; to show ‘role shift’; to contrast pseudo-questions (rhetorical and echo) with genuine questions; and for marking time.

Concerning lexical distinctions, there are some signs, in which eye gaze is obligatory, e.g. BSL GOD and HEAVEN. Without the required eye gaze, the sign acquires a different or no meaning. An example of eye gaze fulfilling a meaning distinguishing function is the BSL signs GOD and BOSS below (from Sutton-Spence & Woll 2006:9423).

In cases like these, eye gaze is an essential part of the sign’s phonological description. It serves to distinguish the minimal pair depicted in the above figure. Other non-manual features may have the same function, as will be shown in subsequent sections of this chapter. This emphasizes the importance of the inclusion of non-manuals in phonological models of the sign (cf. chapter 2.5).
Observing the morphological level, it has recently been argued that verb agreement can be expressed non-manually using eye gaze (Neidle et al. 2000; Pfau & Quer 2010). Thus, in transitive sentences a head tilt towards the subject may express subject agreement while eye gaze towards the object may indicate object agreement. This is supposed to hold true for morphologically marked and morphologically unmarked verbs alike. An example can be seen in (1) (taken from Pfau & Quer 2010:393).

\[\text{ann}_{3a} \text{blame}_{3b} \text{mary}_{3b}\]

`Ann blames Mary.'

However, Thompson et al. (2006) found that eye gaze accompanying morphologically marked verbs such as blame is often targeted towards the
object, while in accompanying morphologically unmarked verbs such as love it is often directed towards the addressee or some other location. It is thus not clear whether eye gaze can be used as a non-manual object marker with all kinds of verbs.

Finally, eye gaze (combined with head turns) has been argued to be used to distinguish different personal pronouns from each other. Hence, the direction of eye gaze, the degree of head turn and the direction of pointing align in second person pronouns (Pfau & Quer 2010). In third person pronouns however, these features are not aligned, as the eye gaze and the head follow the direction of the hand when pointing to the addressee. As the issue of pronominalization, especially referring to person distinctions, is still controversial in sign linguistics, more research in this area is needed to analyze unresolved issues.25

3.1.2. Facial Expression

In sign languages, facial expression is not exclusively used in order to express a speaker’s emotions, although it is commonly used for this purpose by spoken and sign language users alike. It also fulfills many grammatical functions in sign languages with respect to several linguistic levels. It is a very complex linguistic feature that needs to take into consideration movements of the cheeks, brows and eyelids (Sutton-Spence & Woll 2006). Prillwitz (1985:63) even lists five constituents of facial expression:

1. Haltung von Kopf, Schultern und Oberkörper (Neigung, Schräger, Anspannung) (= ‘position of the head, shoulders and torso (leaning, incline, tension)’)
2. Augenbrauen (hochgezogen, zusammengezogen) (= ‘eyebrows (raised, furrowed)’)
3. Augenöffnung (weit geöffnet, zusammengekniffen, blinzeln) (= ‘eye aperture (wide open, squint, blinking)’)
4. Blickrichtung (geradeaus, zur Seite, nach oben/unten) (= ‘direction of eye gaze (straight ahead, to side, upwards/downwards)’)
5. Mundpartie (offen, geschlossen, zusammengepresst, Mundwinkel hoch- /runtergezogen, Kussmund, Unterlippe, Zunge) (= ‘mouth (open, closed, pressed lips, corners up/down, puckered, lower lip, tongue)’)

Although included in Prillwitz’s list, body leans (1.) do not form part of facial expression, while eye gaze (4.) was already treated in chapter 3.1.1.
Actions of the mouth are discussed in detail in chapter 3.2. Hence, the relevant constituents to be described here are the eyebrows and eye aperture.

The interplay of different parts of facial expression in order to convey meaning is analyzed with respect to the lexicon/phonology, syntax and prosody or intonation where facial expression is crucial, too. Concerning the areas of syntax and intonation, it is controversial whether facial expression reflects either syntax or intonation. Thus, researchers such as Neidle et al. (2000) argue that grammatical facial expression is a direct reflection of syntax while researchers such as Wilbur (1991) and Sandler and Lillo-Martin (2006) do not agree with this theory and claim that facial expression corresponds to intonation. Trying to provide a balanced picture of the literature, both accounts will be discussed in the following.

3.1.2.1. Facial Expression and the Lexicon

One of the linguistic levels at which facial expression can be crucial for a sign is the phonological (lexical) level where it serves to distinguish signs from each other. In that case, facial expression is an essential part of the sign’s phonological description (Pfau & Quer 2010:382) just like its handshape, orientation and other phonological parameters. However, facial expressions are not lexically specified for all signs, i.e. they are not obligatory for all manuals. Very often, facial expression is obligatory in signs assigning properties in the world’s sign languages; examples of this would be happy, sad or relieved. Here, the facial expression reflects the emotional state that is represented by the sign (Sutton-Spence & Woll 2006; Pfau & Quer 2010). Sutton-Spence and Woll (2006:88) suggest it is a mirror of emotion associated with meaning. Additionally, they mention that a particular facial expression associated with the meaning expressed by the sign (as in the case of happy), can be superimposed on other signs or spread over the remainder of a sentence (Sutton-Spence & Woll 2006). They cite the BSL example sad me why rabbit die in which the sad facial expression used in the sign sad and spreading over the whole sentence would only be interrupted by the sign why which requires a special facial expression as a question marker (Sutton-Spence & Woll 2006:90f).

In some cases for which facial expression is lexically defined, a difference in facial expression may cause a minimal pair. Pfau and Quer mention an example from Catalan Sign Language (LSC) where the signs pity and fall-in-love are only distinguished by negative (furrowed brows and pursed
lips) and positive facial expressions respectively (Pfau & Quer 2010:383). The difference is visible in the figure below.

![Figure 3.3 The LSC signs PITY and FALL-IN-LOVE](image)

Finally, facial expression on its own, without being linked to any manual component, can be meaning-bearing. This is a common feature in all sign languages studied thus far, however, only certain (mostly property assigning or adverbial) meanings can be expressed by this means. Liddell (1980) already found that these are usually actions of the lower face. Pfau and Quer (2010:384f) mention the example of the diminutive and augmentative. Thus, in DGS a sucking in of the cheeks is associated with the diminutive and the blowing of one’s cheeks with the augmentative. Pfau and Quer cite the following example for illustration:

(2) \[
\begin{array}{c}
\text{POSS}_1 \text{ FRIEND HOUSE BUY} \\
\text{[DGS]}
\end{array}
\]

‘My friend bought a small house.’

As the meaning of this sentence is ‘My friend bought a small house’, the modifier ‘small’ is only expressed by the sucking in of the cheeks.

Furthermore, the same non-manuals may have adverbial function or serve as intensifiers when combined with the manual assigning the property. Hence, the sucking in of the cheeks combined with the manual SMALL would express the meaning ‘very small’ (Pfau & Quer 2010:385). Mouth actions fulfilling adverbial functions are discussed in section 3.2.1.

3.1.2.2. Facial Expression and Syntax

On the syntactical level, facial expression has been claimed to serve various functions. However, this was only discovered rather recently in sign language research leading to assumptions that sign languages have a very free sentence
structure. This hypothesis seems logical, given that changes in word order as in topic-comment constructions, e.g., are marked by facial expression or other non-manual features. Thus, varying word orders were attributed to free sentence structures while the different construction types were not noticed. The importance of facial expression was simply not acknowledged.

The co-occurrence of certain facial expressions and syntactic constituents is discussed in the following section in which interrogation, topicalization, relative and conditional clauses are treated.

Firstly, a very general issue concerning facial expression and syntax should be mentioned. Facial expression can determine a sentence’s meaning as far as statements, imperatives or negations are concerned. An example is the sentence woman forget purse from ASL. The change of facial expression according to the meaning of the sign sequence can be seen below (taken from Liddell 1980[28]).

![Figure 3.4 Grammatical facial expression in ASL - Statement](image)

![Figure 3.5 Grammatical facial expression in ASL - Question](image)
The first sequence of pictures (figure 3.4) is a mere statement ‘The woman forgot the purse’. The second sequence (figure 3.5) is a question and the sign sequence is accompanied by several features of facial expression: raised brows and a forward movement of the head and shoulders. The last sequence of pictures (figure 3.6) represents the sign sequence being part of another sentence ‘The woman who forgot the purse has just arrived’. The relative clause is indicated by the raised upper lip and brows and the tilting of the head. This demonstrates that just by changing the accompanying non-manual features (facial expression), one sign sequence may gain several different syntactical meanings. While the above was only a short overview of the existing possibilities in signed languages, some sentence types are discussed in detail in the following.

As was already shown above, facial expression is used in order to mark questions in sign languages. However, not all types of questions are marked by the same non-manual feature or even facial expression. Zeshan (2004) claims that most question types are marked by a distinct brow raise, which is in line with Liddell (1980) who states that actions of the upper face are usually related to syntactic functions. Cross-linguistically, differences occur between yes/no questions and WH-questions. In yes/no questions, the whole sentence is usually accompanied by raised eyebrows while the word order does not change, the brow raise is thus the only indication of the question (Dachkovsky & Sandler 2007). An example of this type of question is the above mentioned ASL sentence WOMAN FORGET PURSE (cf. figure 3.4). As was already pointed out, the non-manual marker of raised brows (and a forward movement of the head and shoulders) are the only question markers. Only very few sign languages (such as NGT, cf. Pfau & Quer 2010) use special (optional) question marking particles in order to mark a question.
WH-questions however, are usually accompanied by lowered eyebrows often combined with a slight backward head tilt (Pfau & Quer 2010). Differences in marking WH-questions occur cross-linguistically between languages where the facial expression accompanies the entire clause as in Italian Sign Language (LIS) (example 3), and languages like ASL where it is possible that facial expression is restricted to the WH-sign if it occurs sentence-finally (example 4, both from Pfau & Quer 2010).

Example 3: [LIS]
(3) le TOMORROW HOUSE BUY WHO
‘Who will buy a house tomorrow?’

Example 4: [ASL]
(4) le TEACHER LIPREAD YESTERDAY WHO
‘Who did the teacher lipread yesterday?’

Examples like these have led for instance Neidle et al. (2000) to the conclusion that non-manual marking directly manifests syntactic structure (Sandler & Lillo-Martin 2006; Sandler 2012). According to them, the WH-question marker is determined by syntactical elements marked with the feature [+wh]. Their account of the obligatory spreading of the non-manual marker for in situ WH-elements is depicted below.

Example 5: [ASL]
(5) __wh WHO LOVE JOHN
‘Who loves John?’

Example 6: [ASL]
(6) _wh *WHO LOVE JOHN [+wh]_C

Example 7: [ASL]
(7) __wh *WHO LOVE JOHN[+wh]_C

In this case, there is no lexical material in the [+wh]_C which is, suggest Neidle and colleagues, the reason for the obligatory spreading of the non-manual marker.

Another explanation for the non-manual WH-marker was put forward by Petronio and Lillo-Martin (1997). They claim that spreading of the non-manual marker is uniformly obligatory as according to them, the marker is a realization of the [+F, +WH] of the head C of an interrogative (Sandler &
Lillo-Martin 2006:451). This however, would contradict reality, as sentences such as (4) would be impossible. To them, these types of sentences are two sentence discourses with a null element. However, they admit that examples as in (8) (taken from Petronio and Lillo-Martin 1997:48) are more acceptable in clear discourse contexts.  

(8) \_whq  

\texttt{someone buy car who}  

\texttt{[ASL]}  

\texttt{‘Someone bought a car. Who?’}  

A third account for the distribution is linked to intonation and prosodic constituents. However, syntactic and prosodic structures are closely linked so that it is not always easy to distinguish whether a certain feature should be attributed to syntax or intonation. Moreover, the relations between intonation and non-manual markers are elaborated on in section 3.1.2.3 and will thus not be treated further here. The only reported exception from the general pattern of WH-questions marked by lowered eyebrows, seems to be Indopakistani Sign Language (IPSL). Here, WH-questions are marked by raised eyebrows and a chin up and forward movement (Aboh et al. 2005 cited in Pfau & Quer 2010:388).

The next issue to be discussed is topics. While they are first and foremost concerned with information packaging serving a discourse function, and thus belong to the domain of pragmatics, topicalization also has an impact on the sentence structure which is why I treat topics in this section.

It is sometimes claimed that sign languages are topic-prominent languages such as Chinese. From a syntactic point of view, in sign languages just as in spoken languages, topics are usually realized by a constituent at the left edge of the sentence. While in spoken languages topics are often set apart from the remainder of the sentence by intonation, in sign languages they are accompanied by a non-manual marker. Pfau and Quer (2010:388f) mention that the basic marking for topics in sign languages is brow raise (as for example in Australian Sign Language (Auslan) and NGT) although it can be combined with other non-manuals depending on the information conveyed. For most sign languages, however, the subtle differences in layered non-manuals for topics have not been researched. For ASL however, topic markers have been clearly identified. Aarons (1994 as cited in Sandler and Lillo-Martin 2006:407) mentions three for ASL:

1. \texttt{tm1: raised brows; head tilted slightly back and to the side; eyes widened; head moves down and forward}
2. tm2: large movement of head back and to the side; eyes very wide, head moves down and forward
3. tm3: head forward, jerked slightly up and down; mouth open; upper lip raised, eyebrows raised; eyes wide open, fixed gaze, slight rapid headnods

The different topic markers are illustrated below (pictures taken from Sandler and Lillo-Martin 2006:408):

![Figure 3.7](image1) tm1 for ASL

![Figure 3.8](image2) tm2 for ASL

![Figure 3.9](image3) tm3 and alternative version for ASL

The choice of the different markers depends on the kind of topic and on the information conveyed. Sandler and Lillo-Martin (2006:407) define the different functions of tm1-3 as follows. Topics of the kind tm1 are used either
to identify a particular member of the universe of discourse, for emphasis or for contrastive focus. Tm2 topics are employed in order to introduce new information which changes the discourse topic. Finally, tm3 topics could be translated by ‘you know X’.

Additional concrete examples of differences between different topic markings can be cited for Hong Kong Sign Language (HKSL), where Sze’s (2009:8) findings revealed that different kinds of topics such as scene-setting or aboutness topics are accompanied by different non-manuals such as brow-raising or head tilts. Moreover, non-manuals behave differently if sentences are negated or include a verb with a negative meaning.

(9) **SECONDARY-TWO, START PLAY BASKETBALL, HAVE-COMPETITION, FARE-BETTER THAN**

`At secondary two (=grade 8), I started playing basketball and had competitions; I was better than (other senior schoolmates).’

(10) **LOUSY X-1 DISLIKE**

`Lousy (handwriting), I don’t like (it).’

While example (9) belongs to her group of scene-setting topics featuring an NP that sets up a temporal domain (Sze 2009:6) in which the topic is accompanied by a forward head tilt and raise, example (10) is called a “fronted non-grammatical object” which is normally not marked except in negations and when a verb with a negative meaning is involved.

For relative clauses, cross-linguistic tendencies can be identified as well. Thus, they are usually marked by raised eyebrows (Pfau & Quer 2010). This was already shown for the example **WOMAN FORGET PURSE** from ASL (figure 3.4). In this case, several non-manuals were layered as the relative clause was not only indicated by raised brows but also by a raised upper lip and tilting of the head.

However, there seem to be typology-related differences in the structure of relative clauses across sign languages. The use of head-internal relative clauses has been identified for ASL whereas the use of head-external relative clauses has been found in DGS (Pfau & Quer 2010; Pfau & Steinbach 2005 for DGS relative clauses). Hence, in DGS relative clauses, the head is usually out of the scope of the non-manual marker which either only marks the relative pronoun or extends over the whole relative clause. This led Pfau and Steinbach (2005) to the conclusion that DGS relative clauses are externally headed. An example of this can be seen below (taken from Pfau & Quer 2010:393).
Non-Mouth Related Non-Manuals

In languages such as ASL and LIS, the non-manual marker extends over the head noun as well. In LIS, the clause-final marker PE is added at the end of the relative clause. A typical relative clause construction in LIS would thus look like this (Pfau & Quer 2010:392):

(11) TOMORROW [MAN (INDEX₃₃) [RPRO₃₉ TIE BUY]] [DGS]

conference go-to

‘Tomorrow the man who is buying a tie is going to a conference.’

Dachkovsky and Sandler (2007:26) found that in IsSL, relative clauses are usually marked by a squint. They argue that this is linked to a systematic correlation between the type of a linguistic construction, its pragmatic function and non-manuals. They claim that squints, e.g., are used when information has to be retrieved from the hearer’s background knowledge. Especially restrictive relative clause constructions were marked by a squint because the referent is “known or knowable to the addressee” (Dachkovsky & Sandler 2007:26) but not the current topic of the conversation. An example of this kind of construction can be seen below (Dachkovsky & Sandler 2007:26).

(13) HOUSE INDEX₁ TOGETHER-WITH-YOU SEE INDEX RENT [IsSL]

‘Finally we rented the apartment that I’d seen together with you.’

The function of the above relative clause is to move a referent that is not the centre of the current situation into that same centre of the communication. That is why a squint, which signals that the addressee has to retrieve some piece of information from his background knowledge, is used in this case. However, Dachkovsky and Sandler’s investigation is one of the first systematic analyses of the correlations of pragmatic functions of sentence structures and non-manual features which remains to be done for other sign languages as yet.

Just like relative clauses, the non-manual marker for conditionals is the same cross-linguistically. Raised eyebrows are the most prominent feature
and are usually combined with a raised chin, for instance. Usually, the clause that describes a hypothetical situation (= protasis) is accompanied by the non-manual feature. Also, it usually appears in sentence initial position (Pfau & Quer 2010:9).

Prillwitz (1985) provides an example of conditional clause marking in DGS. The conditional clause and the main clause are only distinguished by facial expression; no conjunctions are used. The transcription and the signed sentence are shown in figure 3.10 below (taken from Prillwitz 1985:57, drawing by Heiko Zienert):

Figure 3.10 The use of facial expression in conditional clauses in DGS

<table>
<thead>
<tr>
<th>Bedingungssatz</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICH NOCHMAL SCHWEIZ FAHREN-NACH, ICH DIESELBE STRECKE AUTO-FAHREN</td>
</tr>
</tbody>
</table>

The German meaning of the sentence is ‘Wenn ich wieder einmal in die Schweiz komme, dann nehme ich wieder dieselbe Strecke.’ (= ‘If I come to Switzerland again, I will take the same route.’). As can be seen in the pictures, the signer has raised eyebrows, his eyes are wide open and his head is slightly tilted while signing the conditional sentence. At the beginning of the main sentence his facial expression becomes less tense and he leans backwards. Although there are signs for the conjunction ‘wenn’ (= ‘if’) in DGS, it would be more idiomatic to use facial expression only
in order to express the change from subordinate to main clause. Prillwitz states this, too:

[...] In der deutschen Lautsprache werden Bedingungssätze meist mit dem Bindewort wenn eingeleitet. Eine entsprechende Bindegebärde kennt auch die DGS. Sie ist eindeutig von dem Wort wenn abgeleitet: Der Zeigefinger berührt die Nase an der Seite (= Kennzeichnung des Nasallautes in wenn). Um einen Bedingungssatz eindeutig zu kennzeichnen, verfügt die DGS jedoch auch über eigene Mittel. Wie unser Beispielsatz zeigt, wird auch hier wieder die Mimik eingesetzt. [...] (Prillwitz 1985:57)

[...] In spoken German, conditional sentences are usually introduced by the conjunction wenn. A corresponding conjunctional sign is also present in DGS. It is obviously derived from the word wenn: the index finger touches the side of the nose (indicating the nasal in wenn). However, in order to unambiguously mark a conditional sentence, there are also language inherent means in DGS. Our sample sentence shows that facial expression is utilized as well. [...] 

Similarly, in ASL, the manual conditional markers i-f and SUPPOSE do exist, too; but their use is optional.

Finally, it is sometimes argued that there are different non-manuals for different kinds of conditionals. Thus, Dachkovsky and Sandler (2007) observed that in IsSL, neutral or factual conditionals are marked by brow raise only, while counterfactual conditionals are marked by layered non-manuals, namely a squint and a brow raise. Their analysis of the correlations of sentence structures’ pragmatic functions and non-manuals was already elaborated on above. In this context, it is obvious why in counterfactual conditional clauses (in which knowledge to the contrary of the proposition of the if-clause is entailed), have to be accompanied by a squint. The speaker appeals to some shared background knowledge which has to be present for a counterfactual conditional to work. An example from Dachkovsky and Sandler (2007:28) illustrates this.

\[\text{brow raise+squint}\]

\begin{equation}
\text{IF GOALKEEPER HE CATCH-BALL, WIN GAME WIN}[\text{IsSL}]
\end{equation}

‘If the goalkeeper had caught the ball, (the team) would have won the game.’

In this case, the addressee’s knowledge of the goalkeeper not catching the ball is presupposed by the speaker. Thus the squint becomes necessary in the sentence. Dachkovsky and Sandler (2007) and Sandler (2012), e.g., also
linked the different kinds of non-manuals and their correlation with certain syntactic patterns to intonational patterns which are often closely linked to syntax. This is analyzed in the subsequent section.

3.1.2.3. Facial Expression and Prosody

The last level to be mentioned at which facial expression is crucial in sign languages is the prosodic level. It is sometimes hard to distinguish whether a certain non-manual correlates with syntactic or prosodic structure in sign languages, but Sandler (2012:59) solves this apparent controversy by stating that “prosodic constituents are related to syntactic ones but are not always coextensive with them”. Before discussing evidence for the link between non-manual markers and prosody, it should be mentioned that in sign languages just as in spoken languages, prosodic chunks are organized according to the prosodic hierarchy according to Selkirk (1984) (cited in Pfau and Quer (2010:397)).

syllable > foot > prosodic word > phonological phrase > intonational phrase > phonological utterance

Concerning terminology, some researchers, such as Sandler and Lillo-Martin (2006) argued that the term “intonation” is not adequate for sign languages as it is too closely linked to pitch in spoken languages. Hence, they introduced the term “superarticulation” to refer to the array of superarticulatory non-manual features that accompany manual signs in sign languages (Sandler & Lillo-Martin 2006:257). Sandler (2012) reintroduces the term intonation. Similar to terminological controversies concerning “phonology” vs. “cherology” in sign languages, I have decided to adopt the term “intonation” for this book in order to stress its comparability to spoken language intonational phenomena.

The parallels between spoken and sign language intonation are noteworthy. Thus, the illocutionary, pragmatic and semantic functions are the same, componentiality exists in both spoken and signed languages and the prosodic constituents (the phonological phrase and the intonational phrase) exist in both modalities. However, due to the anatomical predisposition of the human body, and for modality-dependent reasons, differences between the two systems are found as well. Contrasting with spoken languages that can only make use of the vocal cords, there is more than one articulator, i.e. the different movements of the articulators in sign languages (such as the brows, the lips, etc.) may potentially result in a richer intonational system.
This, however, has not been empirically researched yet (Sandler & Lillo-Martin 2006:261). One of the results of the variety of articulators in signed languages has been attested though: the simultaneous arrangement of intonational features, where simultaneity refers to two different things. Firstly, the superarticulations are arranged simultaneously to the manual features or text, and secondly, they are arranged simultaneously to each other. This kind of organization is not possible in spoken languages. An example of the layering of non-manual features (not only facial expression) in intonation can be seen below (taken with slight changes from Sandler & Lillo-Martin 2006:256).

(15) \[
([\text{book-there}]_p [\text{index}_3 \text{write}]_p)_{\text{INT}} ([\text{interesting}]_p)_{\text{INT}}
\]

brows \underline{_________________________} up \underline{________} down

eyes \underline{________} squint \underline{________} droop

mouth \underline{________} ‘O’ \underline{________} down

head \underline{_________________________} tilt

mouthing \underline{________} ‘book’ \underline{________} ‘interesting’

torso \underline{_________________________} lean

As is clear above, intonation in sign languages is componential. This means that non-manual arrays usually consist of more than one non-manual feature of which each one is meaning-bearing. Each feature has a more or less fixed meaning, i.e. that certain facial expressions seem to be linked to certain pragmatic functions (Sandler 2012). This was already mentioned for the correlation between facial expression and syntax as in conditionals, for example. However, the facial expressions observed in many of the above mentioned sentence types, could also be interpreted as intonational contours. Thus a brow raise and wide eyes (and a forward head position) that are usually used in yes/no questions could be equaled with a rising pitch contour (high tone) that is almost universally found in spoken languages (Bolinger 1989). Contrary to spoken languages, where the pitch contour usually only occurs on the last syllable of the prosodic phrase, non-manuals in sign languages spread over a whole sign or clause. Nevertheless, prosodic constituents are not isomorphic with syntactic constituents, i.e. the prosodic word and the morphosyntactic word do not always coincide. This is the same in spoken languages as can be seen in (16) below (example taken from Sandler & Lillo-Martin 2006:264).

(16) **Syntactic:** [This is [the cat that killed [the rat that ate [the malt]]]]

**Prosodic:** [This is the cat] [that killed the rat] [that ate the malt]
The same phenomenon can be observed in sign languages. In spoken languages, it is very common for unstressed function words to group together with a nearby prosodic word through the process of cliticization, thus forming a new prosodic word. This can be observed in sign languages, too, where personal pronouns may assimilate to a neighbouring lexical sign by change of handshape (e.g. Sandler 1999; 2012).

As becomes evident from this rather brief sketch of prosody in signed languages, facial expression may relate to intonation and prosodic constituents in sign languages rather than to syntactic constituents. However, as was already mentioned above, it is often not easy to clearly distinguish prosodic and syntactic constituents. The examples mentioned in this section provide some evidence for facial expression being linked to intonation. Further research in this area is needed in order to clarify the remaining unresolved issues.

3.1.3. Head Movements

Head nods and head shakes can be used similarly by speakers of spoken and signed languages. Thus, Sutton-Spence and Woll (2006:92) mention that head nods may be used to signal ‘yes’ or agreement in BSL without using any manual sign at all. In many spoken languages, head nods signal agreement, too. Moreover, they mention head nods as an important feature of BSL that signals attention during a conversation, making a head nod in these situations a discourse feature. Apart from these discourse or non-grammatical
functions, head nods, shakes and tilts have grammatical functions which will be discussed in turn below.

One of the functions of head nods in BSL mentioned by Sutton-Spence and Woll (2006) is the indication of the first person. In this case, the manual sign for the first person singular becomes oblivious and can be discarded altogether. Moreover, fast head nods indicate that a signer insists on the truth of an utterance. Phenomena like this are encountered in spoken languages as well. Thus, fast head nods are similar to French si or Portuguese é. Sutton-Spence and Woll (2006:92) mention the example of fast head nods in the sentence CAT DOG CHASE which means ‘Yes, the cat did definitely chase the dog, no matter what you think.’

Finally, single or successive small nods may be used to indicate that the information given in an utterance is complete or that a comment upon a certain statement is complete. Sutton-Spence and Woll (2006:93) mention the example FLY LONDON ATHENS followed by a small head nod, AEROPLANE LAND followed by a small head nod. In this case, the head nods both indicate that the piece of information given is complete. It is also argued that in ASL, predicates of a conditional clause are often accompanied by a head thrust (Pfau & Quer 2010:389).

A side-to-side headshake is closely linked to negation in sign languages. Most sign languages studied so far have a non-manual means to negate sentences (Pfau & Quer 2010). However, the distribution of these head shakes is different cross-linguistically. The most common patterns that can be observed in ASL, e.g., are a side-to-side head shake that either accompanies the manual negation particle only or spreads over the whole VP. The manual negation particle is not obligatory in this case. The non-manual feature alone suffices to negate the sentence. The option without the manual component seems to be favoured by most sign languages. The different ways to negate a sentence in ISL were already discussed in chapter 2.6. In case no negation particle is present, the non-manual has to spread over the VP (Pfau & Quer 2010:386). An example from ASL can be seen below (taken from Pfau & Quer 2010:387).

\[ \text{hs} \quad \text{[hs]} \]

(17) a. JOHN NOT BUY HOUSE

‘John didn’t buy the house.’

\[ \quad \text{hs} \]

b. JOHN BUY HOUSE

‘John didn’t buy the house.’
Some sign languages, however, show different patterns for the non-manual only options. In LSC, e.g., it is possible that the head shake only accompanies the predicate.

Yet another, completely different type of sign languages with respect to negation, are “manually dominant” sign languages (Zeshan 2006). In these sign languages it is ungrammatical to negate a sentence by using a head shake alone. Sign languages of that kind are for example HKSL and LIS. In other sign languages such as Turkish Sign Language (TSL), e.g., a backward head tilt is more common in order to negate a sentence and co-exists with a head shake (Pfau & Quer 2010:387).

Moreover, Sutton-Spence and Woll (2006) mention a side-to-side head shake as a means to respond in the negative to a yes/no question, as a means of negation of rhetorical questions, to negate a topic and to negate a whole clause in BSL. This could be seen in example (17b). In most of these cases, there is no form of manual negation, the head shake suffices in order to express the negative.

Beside the grammatical functions of head shakes mentioned above, head shakes can also express emotions such as regret, frustration, disbelief or sorrow (Sutton-Spence & Woll 2006:94). An example of this (taken from Sutton-Spence & Woll 2006:94) can be seen in (18) below.

\[
\text{hs}\]

\begin{align*}
(18) & \text{GROUP LEAVE NINE-O’CLOCK ARRIVE ME FIVE-PAST NINE GONE [BSL]} \\
& \text{‘The group left at nine o’clock, and I arrived at five past nine, to find them gone.’}
\end{align*}

Finally, it seems noteworthy that topics are often marked by head tilts or specific head positions in many sign languages of the world such as ASL or HKSL. However, head tilts usually do not serve as the only topic marker but are layered with other non-manual components such as brow raises, for instance. As this was already outlined in detail in section 3.1.2.2, I will not elaborate on this again.

3.2. Mouth Actions

Almost forty years after the beginning of extensive research on mouth actions especially in European sign languages, mouth patterns are still a controversial topic among sign linguists. As yet, researchers have been unable to define the exact nature and functions of the different kinds of mouth actions.
Especially in ASL, mouth actions are an under-researched topic because mouthings in particular have been rejected by many. A study by Nadolske and Rosenstock (2007) has acknowledged the existence and importance of mouthings in ASL and demanded further investigations into that direction. Differences in frequency and usage seem to be due to a high or low degree of cross-modal language contact, especially with respect to oralist education policies in deaf schools.

Despite these controversies, a general consensus on the classification of mouth actions into at least two different categories has been reached (e.g. Boyes Braem & Sutton-Spence 2001; Crasborn et al. 2008; Bank et al. 2011; Mohr 2012). There are “spoken components” which are said to be derived from the surrounding spoken language, and “oral components”, formed within a sign language and thus sign language inherent (Sutton-Spence & Woll 2006; Crasborn et al. 2008; Bank et al. 2011). The terms “mouthings” for spoken components and “mouth gestures” for oral components are nowadays widely used (e.g. Raino 2001; Sutton-Spence & Day 2001; Crasborn et al. 2008; Bank et al. 2011; Mohr 2012). I have adopted the latter terminology for my book and will refer to spoken components as “mouthings” and to oral components as “mouth gestures”. Schermer (1990) identified at least three different functions of mouth actions in sign languages. They are disambiguation (of homonyms like bruder/schwester (‘brother/sister’) in DGS), meaning specification and sole carrier of meaning (as adverbs, for instance).

In the following sections, I will elaborate on the different kinds of mouth actions referring to the established dichotomy. I will discuss mouth gestures first and subsequently elaborate on a special kind of mouth gesture called “echo phonology”. In chapter 3.2.3 I will concentrate on mouthings. Finally, in 3.2.4, the form and functions of spread mouthings are treated.

3.2.1. Mouth Gestures

As already mentioned in the previous section, mouth gestures are inherent in sign language, they have always belonged to the linguistic system of sign languages. Mouth gestures do not seem to be derived from or related to spoken language words. In general, a mouth gesture can be defined as a mouth pattern that either changes or remains constant during the articulation of a sign (Pfau & Quer 2010). Thus, in the DGS sign haben (‘have’), the hand (>hand) performs no movement except for a wriggling of the fingers, the mouth gesture is “shhhhhhhhh” (constant mouth gesture). In the
BSL sign disappear, the manual components (a closing of the hands and an abrupt final stop) are echoed by the mouth gesture starting as an interdental fricative and ending in a bilabial stop (Crasborn et al. 2008:49) (changing mouth gesture). The latter kind of mouth gesture will be treated in detail in section 3.2.2 on echo phonology.

While a more general distinction between mouthings and mouth gestures is made by almost all researchers in the field (e.g. Raino 2001; Boyes Braem 2001; Lewin & Schembri 2011), Crasborn and colleagues (2008) introduced a more fine-grained distinction of four different kinds of mouth gestures. They distinguish between “adverbial mouth gestures”, “semantically empty mouth gestures” and “enacting mouth gestures” and “mouth activity in the context of whole face activity” (Crasborn et al. 2008:49ff) according to the lexical and morphosyntactic properties of these groups. The different categories of mouth gestures will be defined in turn in the following.

**Adverbial mouth gestures** specify adverbial information additional to that specified by a manual sign (Crasborn et al. 2008:49). This category was also identified by Sutton-Spence and Woll (2006:86f) as “manner and degree adverbs”. It seems to be present in most sign languages, and has been identified in many sign languages known to date including ASL, BSL and Swedish Sign Language (SSL).

From a morphological point of view, these adverbs could be analyzed as bound morphemes because they usually combine with the manual component of the sign. They add information on the manner or effort of an action as well as indicating the size of an object or the degree of an adjective. Thus, the mouth gestures might not exclusively be used in order to modify a verbal sign but also in order to modify a nominal sign and thus fulfill adjectival instead of adverbial function. Some researchers include adjectival mouth actions in this category if they are productive (Sutton-Spence & Woll 2006:86). A typical example of a manner and degree adverbial mouth gesture are puffed cheeks meaning ‘large, long’ in DGS.

**Semantically empty mouth gestures** may be obligatory in signs in order to guarantee well-formedness but do not carry extra or independent meaning (Schermer 1990, Crasborn et al. 2008:49). Usually, the movement of the mouth parallels the movement of the hands and never opposes it. The above mentioned BSL sign disappear is an example of this kind of mouth gesture. These signs have been analyzed as echo phonology by Woll (2001) and will be elaborated on in section 3.2.2.

In **enacting mouth gestures** the mouth performs real actions such as laughing, vomiting, biting (although sometimes in a stylized way) and can thus function as the sole articulator. These mouth gestures may accompany
a manual sign as for instance a chewing movement that accompanies the sign *chewing*, or they may be the sole articulator of an action as in *laugh* (Crasborn et al. 2008). The latter kind seems more complex, as it is not frequently attested in earlier stages of sign language development as in younger sign languages such as Mauritian Sign Language (MSL) (Adone et al. 2009).

**Mouth actions as part of overall facial expression** shall only be elaborated on very briefly here. They will not be relevant for the analysis of the collected data for the reasons mentioned in the following.

Certain mouth actions appear as part of, as Crasborn and colleagues call it, “a global facial expression” (Crasborn et al. 2008:50). In this case, the mouth is active during sign production but is not independent of facial expression as in other cases. This kind of action has to be considered as one special kind of mouth gesture (Crasborn et al. 2008). Mouth actions in the context of overall facial expression often occur with an affective rather than a grammatical meaning as in the example of the expression of disgust where the mouth is involved but has no independent role (Crasborn et al. 2008:51). They might also be part of the phonology of the sign as in signs like *sad*. Because of the often non-grammatical meaning of the mouth actions, they have been left out of the current investigation.

A final issue that seems noteworthy in regard to mouth gestures is the fact that their frequency seems related to the morphological complexity of a sign. Thus, they occur more frequently with morphologically complex signs (Adone et al. 2009) such as verbs and especially classifiers for example. This has been found for other sign languages like SSL, NGT and BSL as well (Crasborn et al. 2008). However, verbs have proven to be a somewhat difficult matter. Bank et al. (2011) report that high frequency NGT verbs can be combined with either a mouth gesture or a Dutch mouthing. Moreover, while verbs have been divided into different types as for example in the Nadolske and Rosenstock study (2007) (they categorized verbs into directional verbs, aspect verbs, plain verbs and modal verbs) other studies such as Crasborn et al. (2008) and Adone et al. (2009) did not subdivide the verb classes. Certainly, the differences concerning the matter of classification of verbs depend on the focus of each single study. An in-depth study of the distribution of mouth actions with respect to different verb types remains to be done. However, inter- as well as intra-linguistic variation is to be expected. A preliminary analysis for ISL is discussed in 6.2.3.

After the description of the different kinds of mouth gestures, a special analysis of one kind of mouth gesture, namely enacting mouth gestures, will be described in more detail under the heading “echo phonology” (Woll 2001).
3.2.2. Echo Phonology

The theory of echo phonology was first elaborated in Woll’s 2001 article “The Sign That Dares to Speak Its Name: Echo Phonology in British Sign Language (BSL)” (Boyces Braem & Sutton-Spence (2001), pp. 87–98). It refers to a special kind of mouth gesture that has so far only been researched for BSL. Woll’s theory will be outlined in the following.

Her account is based on the fact that there are different kinds of mouth gestures, namely constant and changing mouth gestures, as already outlined in section 3.2.1. While in constant mouth gestures the position of the mouth is held constant throughout the articulation of the manual sign, in changing mouth gestures the mouth configuration usually changes during the articulation of the manual. Woll (2001:90) observes that constant mouth gestures usually occur with adverbials (such as “tense spread lips” in BSL). In contrast, echo phonology mouth gestures usually occur with a changing mouth gesture (Woll 2001:91). Another defining feature of echo phonology mouth gestures, according to Woll, is that they occur in the citation form of signs and that they are obligatory for the sign to be well-formed, i.e. they are part of the phonology of the sign. The characteristic of these mouth actions that led Woll to call them echo phonology, is that these kinds of mouth gestures always mirror or echo the manual movements of the manual sign (Woll 2001:91). This is in line with the well-known fact that manual and oral actions are often well coordinated (Nobe 1996). However, contrasting with spoken languages where the mouth is the driving force for accompanying gestures of the hands, in echo phonology the hands “drive” the mouth. The example of the BSL sign succeed shows that the thumbs are initially in contact and move apart abruptly while the mouth articulates /pa/. (Woll 2001:92) contrasts this with an impossible version of succeed in BSL because the signer inhales which opposes the movement of the hands.

Woll identified a number of recurring elements for echo phonology in BSL. In order to provide an overview of the elements that have been attested, some of them are mentioned below. It is noteworthy that almost all listed items involve articulations at the front of the mouth or lips because they are most visible at that point (Woll 2001:92, f.). Some of the consonants (in syllable initial and final position) that have been observed are /p/ and /m/ and the vocalics /y/, /w/ and /u/. Woll also mentions exhalation and inhalation breath patterns (Woll 2001:93).

The theory elaborated above may provide further insights into research areas such as the structure of the sign syllable, sonority and language evolution. Echo phonology provides the opportunity to gain a deeper insight into
the relationship between signed and spoken language phonology because mouth movements in echo phonology are derived from the manual sign. Thus, the syllable structure of the manual component and the syllable structure of the echo component can be investigated at the same time (Woll 2001:95). Furthermore, echo theory might also contribute to the description of manual syllable structure and the sequential nature of sign syllables and sonority hierarchies in particular. Finally, Woll’s theory provides a concrete example of how arbitrary spoken forms and non-arbitrary (iconic) gestural forms are interrelated.

The above discussion of echo phonology in BSL provides interesting implications for signed and spoken language research alike. A next desirable step would be an investigation of mouth gestures in other sign languages with a particular focus on echo phonology.

3.2.3. Mouthings

In spite of a large body of literature on mouth actions, the exact status, function and origins of mouthings have not been clearly determined yet. There are many different opinions concerning this phenomenon in sign languages and theories vary considerably. Bank et al. (2011: 251) describe current accounts of mouthings as a continuum ranging from mouthings as outcomes of online code-blending on the one end to mouthings as fully lexicalized items in the lexicon of a sign language on the other end. Three theories of mouthings in sign languages will be presented and placed on this continuum. Differences and similarities of current theories will be outlined subsequently.

Situated towards the end of mouthings as an outcome of online code-blending is the theory by Hohenberger and Happ (2001). The research team including Leuninger, view the phenomenon from a generativist point of view. In their 2001 paper they especially take psycholinguistic theories on language production and sociolinguistic theories of language contact into account. Their point of departure was that sign languages as minority languages have always developed in contact with the surrounding spoken languages. Thus sociolinguistic factors are highly influential as parameters such as language prestige, the distribution of linguistic and societal power, educational and teaching infrastructure and general acceptance of a signed language in society may play an important role for the use of mouthings. They also claim that the origin of mouthings is oralist education (Hohenberger & Happ 2001:155).
Hohenberger and Happ (2001:157) believe that mouthings result from mixing the spoken and signed language mode. From the standpoint of Generative Grammar, they argue that signing relates to both signed language competence and performance, mouthings however are a mere performance phenomenon (Hohenberger & Happ 2001). A fact that, according to them, substantiates their claim is that sign language can dispense with mouthings altogether which can be seen in the varying degrees of mouthings observed in different signers. These range from full to reduced to no mouthings at all. The origins of this highly varying use of mouthings in their study could not be related fully to the family situation or type of language acquisition (i.e. if the parents are hearing or deaf) as attempted. As it has generally been stated in the literature that mouthings are context dependent (e.g. Sutton-Spence & Day 2001; Nadolske & Rosenstock 2007), this could be an explanation for the varying use of mouthings as well.

Concerning the nature and frequency of mouthings, Happ and Hohenberger’s findings are in line with observations from other languages such as MSL. Thus, mouthings occur mostly with nouns or lexical categories in general. Mouthings cannot occur with morphologically more complex signs because inflections seem to represent a problem for mouthings. Inflectional information is only conveyed by a sign and not by its mouthing. The most common kind of relation between mouthing and manual sign is that of semantic redundancy. This is the case when mouthing and manual sign convey the same meaning. As will be shown in 6.2, this view seems rather controversial and far from actual linguistic reality.

Summarizing, in Hohenberger & Happ’s account, mouthings are viewed not as an integral part of sign languages, but merely as a peripheral performance phenomenon. They can be dispensed with and only came into sign languages via language contact. In light of the findings from ISL that are presented in chapters 4, 5 and 6, these claims are highly doubtful.

A somewhat intermediate account on the continuum of mouthing theories is put forward by Keller (1999; 2001). Acknowledging and searching for an explanation of the relations between mouthings and signs that vary individually, systematically and with respect to particular items, he supported a kinematic theory of mouthings. While assuming that language contact is the driving force behind mouthings in DGS, he denies that the interplay of language processing and bilingual or diglossic knowledge of German and DGS fully accounts for the data (Keller 2001:192). Relying on language acquisition data, he doubts that mouthings actually denote, as children would be unable to communicate as long as they have not mastered an assumed mouthings system. Rejecting Hohenberger and Happ’s theory, he claims that
their analysis is neither applicable to all sign languages, nor does it account for the nature of mouthings (Keller 2001:198, f.).

Keller mentions a whole list of problems that have seriously hampered empirical research on mouthings in sign languages. One of these problems is the great variation in the use of mouthings. This variation may be due to educational factors (such as an education under oralism or not), social factors, differences in first and second language acquisition, sign language proficiency (the frequent use of mouthings might be tied to low sign language proficiency, for example) or regional variation.

Moreover, there are several methodological problems as, for example, phonologically biased researchers and transcription problems stemming from overenthusiastic researchers who transcribe whole words of the surrounding spoken language although these are not present (Keller 2001:203, f.). This last problem is explained by the McGurk-Effect from psycholinguistics which shows that visual information often facilitates auditory perception (cf. e.g. McGurk & MacDonald 1976). This kind of perception is, however, only available to hearing people. In deaf people, he suggests, “only the visible information channel contributes to identifying a specific mouthing” (Keller 2001:205). Thus, he reasons, there is no distinction between mouthings and mouth gestures as they are both language related oral gestures. He finally states that both have to serve similar functions. However, only mouth gestures are fully lexicalized while mouthings are purely kinematic in nature. He puts forward the hypothesis that mouthings will drop out of a sign language in the course of its development. This view does not apply to ISL, as will be shown in chapter 5.3.

Furthermore, he elaborates in his empirical research on possible combinations of mouthings and signs. These are: sign + no mouthing, sign + mouthing, sign + several mouthings, no sign + mouthing and several signs + (one) mouthing, which is similar to findings in other sign languages such as NGT (Crasborn et al. 2008; Bank et al. 2011). He cites findings from acquisition research showing that mouthings are acquired holistically and are not segmental, which would actually classify them as gestures instead of linguistic material.

In conclusion, Keller proposes an innovative investigation method for the phenomenon of mouthings. The most important point of his account is the supposed kinematic as opposed to segmental nature of mouthings. This view is certainly interesting as it resolves some of the unresolved issues in other theories of mouthings. However, further research, especially in the field of sign language acquisition, is needed in order to substantiate his claim.
Ebbinghaus and Heßmann (e.g. 1994; 1996; 2001) conducted extensive research on mouthings in DGS. They view sign language as a form of multidimensional communication, of which mouthings constitute one part. They do not believe that manual signs are the words of sign languages, a view that is common among sign linguists (Ebbinghaus & Heßmann 2001:133). They state that manual signs and non-manuals are separate parts of a single unit, especially emphasizing that non-manual signs are meaningful, which is in line with the different linguistic and discourse functions of non-manuals discussed in chapter 3.1. What seems important in this context is the claim that mouthings are different from non-manuals proper (Ebbinghaus & Heßmann 2001:133). While other researchers have adopted this view and it seems to be reasonable at least for DGS, it is doubtful whether this actually applies to ISL as well (cf. chapter 4). In ISL it seems that although etymologically different, mouthings are non-manual features just like mouth gestures, eye gaze, etc.

Furthermore, Ebbinghaus and Heßmann (2001:134) suggest adding information on obligatory non-manual signs to the lexicographic information about a manual sign. According to them, DGS is a language that exists across different modalities and signers use mouthings as an additional source of information for an otherwise semantically under-determined manual sign (Ebbinghaus & Heßmann 2001). The semantic function of mouthings is readily acknowledged while syntactic or grammatical functions of mouthings are challenged. Thus, the disambiguating function of mouthings in homonyms is supported whereas grammatical functions of mouthings are not mentioned. The controversial nature of this claim will be shown in chapter 4, as especially the phenomenon of spread mouth actions reveals crucial syntactic functions of mouthings (as well as mouth gestures).

Concerning the origins and functions of mouthings, Ebbinghaus and Heßmann do not believe that mouthings can be regarded as instances of code-mixing or borrowing as many other researchers do. That would only be the case if the mouthings were spoken language words intruding in the sign language context. They believe that mouthings belong to the sign language context (Ebbinghaus & Heßmann 2001); the context is just unique for the use of spoken words. The mouthed words are often not German (or taken from the ambient spoken language) proper (Ebbinghaus & Heßmann 1996). They are only similar to or fragments of a spoken language word and can only be recognized as a certain spoken language word because they are contextualized by the manual sign.

As is evident above, Ebbinghaus and Heßmann clearly view mouthings as a part of sign languages. According to them, they are just one of many
components that add to the multidimensional communication mode of a sign language.

Despite the controversy on the origins and functions of mouthings, there are certain facts that are universally agreed on. Most researchers today concur that mouthings originated as borrowings from spoken languages (e.g. Raino 2001; Boyes Braem 2001; Sutton-Spence & Woll 2006; Nadolske & Rosenstock 2007). The functionality of mouthings varies across different sign languages. Thus, the function of disambiguation of homonyms as in the aforementioned DGS example of BRÜDER/SCHWESTER is uncontroversial for DGS, a sign language that has had a lot of contact with the surrounding spoken language due to an oralist education policy in the last decades. In cases like these, mouthings seem to substitute lexical variation in manual signs. However, it is possible that with an expanding lexicon these mouthings would become unnecessary and fall out of use. In contrast to the situation described for DGS and several other European sign languages, mouthings have been described as very restricted in ASL (e.g. Padden 1980; Boyes Braem 2001). Consequently, their functions remain controversial.

For the lexical level, Boyes Braem (2001) also reports that mouthings may function as gap filling mechanisms in DSGS. This might refer to the linguistic system in general, or to an individual’s language use, especially with respect to later learners.

Furthermore, mouthings might fulfill the function of grammatical derivation. Hence, they act as derivational elements used for the creation of new lexical material (Boyes Braem 2001). These items are usually nominal in character (Schermer 1990; Boyes Braem 2001; Nadolske & Rosenstock 2007; Crasborn et al. 2008; Bank et al. 2011) which is supported by theories on spoken language mixing (Poplack & Meechan 1998). Another phenomenon that has been observed for several sign languages is the link of mouthings to the morphological complexity of a sign or open and closed class differences. Thus, morphologically simple signs (usually nouns and adjectives) occur more often with mouthings while morphologically complex signs occur more often with mouth gestures (Crasborn et al. 2008; Sutton-Spence & Day 2001). Crasborn et al. (2008) state that mouthings are most frequent with nouns and uninflected verbs, open class items and morphologically simple signs, which is supported by their findings for NGT, BSL and SSL where mouthings occur most often with content items (nouns, verbs, adverbs and adjectives) (Crasborn et al. 2008:53). All three languages investigated by them show similar figures for the word class of nouns, for instance: BSL 40%, NGT 39%, SSL 43%. As will be shown in 3.2.4, mouthings may
also function to bind syntactic elements from different word classes by the process of spreading.

Finally, mouthings have been thought to fulfil certain discourse functions such as “constructed speaking” which refers to the imitation of spoken language as used by hearing people and drawing attention to a certain part of a narrative (Boyes Braem 2001).

In spite of the similarities mentioned above, there is a lot of inter- as well as intra-linguistic variation which makes it hard to determine the exact function and status of mouthings. As was already shown in the description of Keller’s theory, there is more than one possible combination of manual sign and mouthing. Even mouthings which do not accompany any manual sign are possible. Vogt-Svendsen (2001) even mentions what she calls “simultaneous compound signs”. In this case, the mouthings function as non-manual adjectives modifying the nominal manual sign. Thus, in Norwegian Sign Language (NSL) the sign pullover might be accompanied by the mouthing rød (=‘red’) expressing the meaning ‘red pullover’. These types of compounds are similar to grammatical derivation by mouthings, as new lexical material is created.

Moreover, Sutton-Spence and Day (2001) and Nadolske and Rosenstock (2007) found striking differences concerning the use of mouthings in different registers and/or text types. For BSL, e.g., 77% mouthings were found for informative registers and only 50% mouthings for narrative registers (Sutton-Spence & Day 2001). Nadolske and Rosenstock investigated mouthing behaviour in ASL for lectures, natural conversation and story-telling. They found that the categories of lecture and natural conversation were fairly similar concerning the use of mouthings (average of 60.4%), however, the occurrence of mouthings in story-telling was much lower (42.4%). This refutes their own and other researchers’ theories that the frequency of mouthings increases with the formality of the situation. Yet, investigations into that direction have to prove this fact for other sign languages.

The form of mouthings may also differ inter- as well as intra-linguistically. Thus, mouthings may be either reduced or full. A whole spoken language word that is mouthed alongside a manual sign such as for example Bruder being mouthed to accompany the manual sign bruder (‘brother’) in DGS is referred to as a full mouthing. A reduced mouthing refers to a spoken language word of which only a part (often the first syllable) is articulated alongside the manual sign as in the example zoek- (from the Dutch word zoeken = ‘to look for’) that accompanies the NGT sign ZOEKEN (Crasborn et al. 2008). Bank et al. (2011) further report that in NGT, the stressed syllables
of Dutch words are usually retained in mouthings, while unstressed syllables might get lost.

Recent studies (e.g. Crasborn et al. 2008) have also investigated the spreading of mouthings. This is the last issue in this section and will be dealt with in section 3.2.4, together with the spreading of mouth gestures.

3.2.4. Spreading of Mouth Actions

Although spreading of mouth actions has been mentioned in the literature on mouth action research, the first detailed study on the spreading behavior of the different types of mouth actions was the Crasborn et al. study from 2008. It was also the first larger cross-linguistic study on this phenomenon, although other studies had certainly mentioned it and provided examples from different sign languages (e.g. Plaza Pust 2005; Pfau 2005; 2009). Other studies such as Sandler (1999) had looked at spreading of mouthings for one sign language (IsSL in this case) only. Crasborn and colleagues investigated whether all types of mouth actions spread, whether the direction of spreading is the same cross-linguistically, and they investigated the spreading domain in further detail looking at its size (Crasborn et al. 2008:56). With their results they hoped to gain further insight into signed languages’ prosodic phonology. I will mainly concentrate on this study, as it is most informative concerning the spread of mouth actions across language boundaries.

Before elaborating on a discussion of spreading of mouth actions in sign languages, I will address some parallels to spreading of tone in spoken languages. Pfau (2009) mentions these parallels of “tone sandhi” in spoken languages and the spreading of non-manual features in sign languages. Concerning spoken languages, there are three possible ways in which tones may spread. Firstly, a tone may spread onto a toneless segment as in Chilungu (a Bantu language of the Niger-Congo phylum), where the high (register) tone of the prefix kú- may spread to all adjacent syllables (except for the last one) as in kú-vúl-à= ‘to be enough’ or kú-sóóbólól-à= ‘to sort out’ (Bickmore 1996: 11).

Secondly, a tone may spread and combine with the tone of the adjacent unit, thus creating a contour tone. In Yoruba (a Benue-Congo language of the Niger-Congo phylum), high and low level tones never combine in bisyllabic words. The tone of the first syllable spreads onto the second syllable resulting in a contour tone (Pfau 2009). This can be seen in /àlá/, [álá] = ‘dream’ or /rárá/, [rárá] = ‘elegy’ (Yip 2002: 47).
Finally, spreading of tone might also involve delinking, resulting in a tone-bearing unit losing its tone (Pfau 2009). Hence, in Barasana (a language of the southern branch of the Tucanoan language family) compounds, the last tone of the first part of the compound spreads onto the second part. An example of this is héè + jài→hééjài= ‘shaman (ancestor-jaguar)’ (Gomez-Imbert & Kenstowicz 2000: 433).

As could be seen in the above examples, tone easily spreads word-internally. The same holds true for word-external spreading onto clitics, for instance. This kind of spreading is similar to the spread of non-manuals in sign languages, as discussed for mouth actions in the following paragraphs.\(^{37}\)

Crasborn et al. (2008) as well as Pfau (2009) found that mouth actions in sign languages may spread onto adjacent functional signs such as pronouns, for example. Especially mouthing (as they often co-occur with nouns or other content words), often spread onto functional signs. Crasborn et al. (2008) found that mouthing spread in a manner similar to mouth gestures (being sign language inherent), a fact which, according to them, proves that mouthing fulfill grammatical function in sign languages and are not due to code-switching (Crasborn et al. 2008:57). However, spread mouth gestures were rare in all three sign languages (SSL, BSL, NGT) investigated. Moreover, intra-linguistic variation was observed concerning this issue as some signers did not use spread mouth gestures at all.

The direction of spreading was very different for the sign languages investigated. BSL showed a pattern of rightward (progressive) spreading, NGT an overall rightward pattern while the data for SSL was very mixed. One of the signers showed as much leftward as rightward spreading while the other signer showed much less leftward spreading. They analyzed the data with respect to two hypotheses. The first is that spreading proceeds from content to function words which is supported by the finding that almost all spreading, irrespective of the direction, went from content words (such as nouns) to function words (such as determiners). The second hypothesis is that mouth actions may spread according to prosodic binding (Boyes Braem 2001) similar to prosodic binding in spoken (tone) languages.\(^{38}\) This theory suggests the prosodic linking of signs to form a syntactic unit (Crasborn et al. 2008:64).

The results were very heterogeneous as in BSL, spreading appears to be strictly rightward, irrespective of the type of sign (content or function). The SSL data could not be accounted for by a content-to-function word hypothesis as for example compound signs (morphological units) that were linked by mouth actions could not be explained. Thus the prosodic binding theory seems to be more likely for SSL. In NGT, mouth actions seem to conform to
the content-to-function word hypothesis. This might cause leftward (regressive) spreading which is not avoided as in BSL, however it is much rarer than rightward spreading (Crasborn et al. 2008:65).

As spreading was observed not only onto the adjacent sign but over more than one neighbouring sign, a claim for the existence of not only prosodic words but also prosodic phrases was made. However, further research in this area is needed to prove or disprove these preliminary findings. Similarly, research on the spreading behaviour of mouth actions in other sign languages is needed in order to investigate whether the direction of spreading is a sign language specific feature or not. The issue of spreading of mouth actions is also discussed regarding the ISL data in chapter 4.2.1. It will be shown that especially theories of prosodic binding seem to be well-substantiated claims.