

The development of sign language competence of deaf children in bilingual school classes:

A description based on the example of a longitudinal study of the development of a deaf pupil (at ages 8;2 and 9;5)

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English translation (2022) of the original German version (2010)

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Preface to German publication of 2010

The present VUGS issue No. 47 is a slightly modified version of the thesis written by Siv Fosshaug for her master's degree program at the Inter-Cantonal School of Special Education, (Hochschule für Heilpädagogik, HfH) in Zurich. In a longitudinal study, the author used two video recordings of the signing of the deaf pupil "Tom" to analyze his development in the use of polymorphemic verbs. She had the pupil Tom look at and then retell in Swiss German Sign Language (Deutschschweizerische Gebärdensprache, DSGS) the picture story without words "Frog, Where are You?" by Mayer (1969). This retelling was done twice by Tom, at ages 8;5 and 9;2. Fosshaug then compared the collected data from Tom with the retelling of the same picture story in DSGS by a deaf adult.

This study provides important new insights into a whole range of questions that should be of interest to deaf educators, as well as to parents of deaf children. One gains not only an insight into the development of the sign language competence of Tom, but also into cognition and narration in the medium of sign language - a medium with which the deaf are naturally familiar, which they can naturally acquire at a very early age and in which they are able to communicate very early and in an age-appropriate way. In addition, interesting comparisons are made with similar research that had been done in other countries. Readers interested in ensuring that deaf children, due to their often slow and difficult acquisition of spoken language do not fall behind in reaching language milestones and in cognition may find here some suggestions for what should happen to these children to avoid their becoming isolated in the hearing world because they lack the words, the grammatical competence and the communication partners which are so important for them.

Benno Caramore, Zurich, March 2010

Foreword by Siv Fosshaug to the English translation (2022)

To reach readers beyond those in German-speaking countries, I decided in 2022 to translate from German into English this modified version of my Master thesis entitled “A longitudinal study of acquisition of ‘classifier constructions’ and narrative structures in Swiss German Sign Language (DSGS)”. I hope that new readers such as students, teachers and school personnel, parents of or professionals working with deaf children, as well as linguists will find this study interesting and useful. I also hope that this Master thesis might provide inspiration for future research on this topic.

More research studies have been done on this topic since 2007, when I finished my master thesis. If I were doing this study today, the literature list would need to be enlarged and updated. Some of the terms I used in 2007 might also need to be updated. However, even with not-updated terms and references, I think the topic remains pertinent today. We still do need more research on deaf children’s sign language development. We still know too little about what one can expect from deaf children of different ages. For example, what marks good narrative skills in sign language and what we can do to give deaf children opportunities to develop better language skills - both written and signed – as well as well-developed general communication skills. After working as a teacher of the deaf for 17 years, both in Switzerland and Norway, and in my current work as assistant principal at Vetland provincial school for deaf and hard of hearing in Oslo since 2017, I can confirm that there is a lot that we don’t know about sign language development and teaching in sign language. In Norway we have the Education Act §2-6 from 1997 that says that deaf pupils can receive sign-bilingual education in Norway from ages 6 to 16. Nevertheless, we still have had very few research studies in the 25 years since this Education Act was passed. I hope that the university school’s cooperation with OsloMet (Oslo Metropolitan University) and the Vetland school and resource center for deaf and hard of hearing will be the start of a future, bigger research project.

I want to give a big thanks to Penny Boyes Braem who has helped me with the translation work. During the translation process, we have had several long discusses about sign language research for deaf children and youth and as well sign language teaching. The discussions have taken place on Zoom, Penny sitting in Basel, Switzerland and I in Oslo, Norway. The world gets smaller thanks to technology development and digital possibilities that improved during the Corona years, technologies that give researchers speedy possibilities for sharing knowledge across the world’s borders.

The original German version of my Master thesis, together with the annotated transcriptions of the three videotapes of data collected in 2005 and 2006 are available on the <https://oda.oslomet.no/oda-xmlui/handle/11250/3045690>

Siv Fosshaug, Oslo, October 2022

Siv Fosshaug

The development of sign language competence of deaf children in bilingual school classes:

A description based on the example of a longitudinal study of the development of a deaf pupil (at ages 8;2 and 9;51.¹)

1. Introductory remarks

I have structured the following chapters so that first a problem definition and the basic research question are presented in Chapter 2. Following this, some preliminary considerations are described in Chapter 3 that into account the theoretical principles that are relevant to my research question. Chapter 4 describes the method that is relevant for my research. The analysis of the video recordings and the evaluation of this data in connection with my research question are documented in Chapter 5 followed by a summary of the research work in Chapter 6.

Much of the information here is based on research done in a workshop on children's sign language acquisition in Zurich (September 2006) as well as from a workshop in London (March 2007) on data gathered using Mayer's 1969 children's picture book "Frog, where are you?" and annotated with the media tagging system 'Elan'. I was able to benefit greatly from these workshops for my MA thesis and more generally for the analysis of the sign language competence of deaf children. I had many valuable discussions with Penny Boyes Braem from which I learned a great deal, and who motivated me and supported my work. Many thanks also go to the two sign language interpreters who helped me to translate Swiss German Sign Language into written German and to my writing tutor who supported me immensely during the whole process of correcting my German texts.

2. Problem definition and research task

2.1 Introduction

I work as a deaf classroom teacher at the Sprachheilschule (Speech Therapy School) in Riehen near Basel where I teach deaf pupils in a bilingual class. The languages of instruction are Swiss German Sign Language (DSGS) and written and spoken German. This bilingual school project is the first pilot project of its kind to be implemented in German-speaking

¹ This publication is a revised version of the 2007 Masters thesis by Siv Fosshaug entitled "Wie entwickelt Tom, ein Schüler der bilingual geführten Klasse in Riehen seine Kompetenz in der Gebärdensprache im Zeitraum zwischen Mai 2005 und September 2006?". The thesis was written in the context of the Master program in the Department of Education at the Inter cantonal University for Special Education, (Interkantonalen Hochschule für Heilpädagogik, HfH) in Zurich.

Switzerland in the last ten years. It was realized not least through the initiative of the parents of the children involved. The idea for the topic of my diploma thesis arose during my lessons in sign language. The question kept coming up about at what level the children, depending on their age, should master the different elements of sign language grammar when telling a story. Since there has been very little research on sign language acquisition for deaf children in German-speaking Switzerland, there is a great need for information and scientific theories on how deaf children progress when telling a story in DSGS. The most important terms in my work with the master thesis are briefly explained in **Appendix 1**.

For spoken language acquisition, there is ample and diverse research and literature. It is known at what respective levels what children should achieve at different ages. These standard scores help teachers assess a child's language competence, so that, based on the standardized benchmarks, it is possible to see whether a child is making progress or is lagging behind in spoken language. This is a great help for teachers. Unfortunately, there has been too little research in this area for sign language (Haug, 2005).

2.2 Research question

In the bilingual class of the Riehen school, there are six pupils with more or less well-developed sign language competence. I will focus on one single pupil in my thesis, whom I will call Tom (name changed). To investigate my research question, I closely observed the pupil Tom and compared my findings with published research results.

After an initial review of the literature, I could refine my original research question about the child's sign language development as follows:

- How does Tom, a pupil in the bilingual class in Riehen, develop his competence in sign language in the period between May 2005 and September 2006?
(Differential diagnosis based on two test situations).
- What is the development of his sign language competence with respect to polymorphemic verbs with classificatory handshapes as well as narrative structures in two episodes of a story?
- Where does his sign language development stand in comparison to an adult deaf person in terms of polymorphemic verbs with classificatory handshapes, their manipulation, and narrative structures? (Comparison of two episodes of the same narrative).

3 Preliminary considerations and theoretical basis

3.1 Language acquisition in spoken and signed languages

3.1.1 How children learn spoken language – the Language Tree

The "Language Tree" model, shown in **Appendix 2**, is from Wendlandt's (2000) book "Sprachstörungen im Kindesalter" ("Language Disorders in Childhood Language"). The tree image illustrates how the child's language (= the crown of the tree) with its three branches (articulation, vocabulary, grammar) can only develop if a number of basic skills are adequately developed (the roots: e.g., vision, hearing, and fine motor skills) and if an understanding of language and the motivation to speak (=trunk) are already present. The tree unfolds only when there is sufficient warmth and light (sun: acceptance and love in the family) and the vital water (daily communication with the child) contains sufficient nutrients (language stimuli). The illustration "Language Tree" represents spoken language acquisition in hearing children. Wendlandt's description of the acquisition of spoken German forms the basis upon which I build my thoughts about the acquisition of DSGS. In the following chapter, I will discuss to what extent Wendlandt's "Language Tree" can be transferred to deaf children learning sign language.

3.1.2 The Language Tree applied to the acquisition of sign language by the deaf child

Much of Wendlandt's spoken language "language tree" can be transferred to sign language acquisition of deaf children. According to findings from studies on deaf children of deaf parents, one can make the basic claim that there are many similarities between the early language acquisition stages of spoken language and those of sign language (Woll, 1998; Volterra & Caselli, 1985). Armstrong et al. (1995) also confirms the comparability of the sequence of developmental stages that deaf and hearing children go through during language acquisition in both languages (as discussed in Grieder, 2002).

Babbling

Much research (e.g., by Deuchar 1984, Masataka 2000, Meier 2000, and Goldin-Meadow 1999) confirms that early in the first year of life, deaf babies with access to sign language go through a stage of babbling. This is equivalent to the voiced babbling of hearing babies. The babies produce signs that are often very similar to signed sentences, however no linguistically analyzable meaning is yet evident (as discussed in Grieder, 2002).

From gesture/vocalization to sign/word

Prinz and Prinz (1979), among others, have previously claimed that sign language is acquired well before spoken language, but this claim has been disputed since then. In terms of the different modalities of signs or words, the transitional phase from prelinguistic to linguistic communication in spoken language now seems clearer (Volterra & Caselli, 1985). What some linguists had initially called a "sign" what should be classified as a "gesture". This distinction between "gesture" and "sign" corresponds to that between "vocalization" and "word" in the speech of hearing children. At an early stage of acquisition, both hearing and deaf children use both the auditory and gestural modality. The study by Ackerman et al. (1990) showed that while children learning sign language develop a larger vocabulary in the first two years of life than do children learning spoken language, this difference is only temporary. Hearing children typically have a vocabulary of about 10 words at 15 months and about 50 words at 20 months. Studies of ASL have shown that children of both languages have vocabularies of similar size (Baker et al., 2000). The imagery (iconicity) of sign language does not seem to make its acquisition easier or allow it to occur earlier. Research has shown that young children use very similar strategies and principles in

acquiring sign language or spoken language. Like the hearing child, the deaf child relies in his language acquisition process in an analysis of the components of language. This is the case despite the fact that many of the forms appear highly pictorial and would be easy for an adult to imitate (Volterra & Caselli, 1985); Baker et al., 2000).

First sentences

At about 18 months of age, the first combinations of two words or two signs, i.e., first two-word sentences, appear. Hearing children with spoken language exposure produce two-word combinations, but then increasingly omit the manual signs they used earlier. Hearing and deaf children who are exposed to sign language, on the other hand, continue to produce combinations of two signs (Volterra & Caselli, 1985). As mentioned earlier, signing and speaking children have similar strategies for acquiring their first language. Deaf people who do not acquire sign language until adolescence or adulthood usually learn the language incompletely. They use a different, holistic learning strategy, matching the forms of the signs to their meanings. Children use a component analysis. As in spoken language, deaf children outperform their models when they are exposed to language at an early age (Volterra & Caselli, 1985). Becker (2006) also emphasizes that there is no evidence that early sign language acquisition negatively affects spoken language acquisition.

Summary

Infants are born with the ability to learn any language. Which language they eventually acquire depends on which one is offered to them (Baker et al., 2000). Combinations of signs or words emerge at approximately the same age. Although there are individual differences, preschoolers go through similar steps at the syntactic and morphological levels in acquiring a spoken language. There is evidence that the acquisition of some syntactic structures spans the first 10 years of life (Baker et al., 2000). In order to develop the components of signs such as handshape, hand orientation, place of execution, movement, facial expression, vocabulary, and grammar in an age-appropriate manner, basic skills must be adequately developed by deaf as well as hearing children. These include skills in the sensory motor, cognition, and the social-emotional domains. Hearing children benefit from the auditory perception channel in the acquisition of spoken language. For the acquisition of sign language, deaf children use vision, visual information, and the other senses more and differently than do hearing children. Mental development and the ability to understand language is a prerequisite for learning sign language age-appropriately. Deaf children also need daily communication, information and language stimulation to develop. There is a close connection between daily, language input and social-emotional development as well as a motivation to sign. Deaf children need both adult deaf persons as language role models and interaction with other deaf children. To maintain and develop their bilingualism and dual cultures, they also need access to Deaf culture. Exposure to written forms of sign language, such as SignWriting², can support their awareness of the various components that comprise each sign and sign language grammar. Another important condition for deaf children in their development of sign language is that they experience acceptance and love in the family. Every deaf child goes through an individual language development.

² Sign writing is a kind of "alphabet," a visually represented list of symbols.

I think that the account in Grohnfeldt's (1999) book "Disorders of Language Development" is valid for both spoken language and for signed language. Grohnfeldt suggests that the developmental foci are diverse and cannot be viewed in isolation. It is an integrative development in which the different areas overlap and are weighted differently depending on the age and stage. (See **Appendix 3**: The underlying multidimensional development model.)

3.1.3 Temporal sequence of the acquisition and development of sign language

Many previous studies on acquisition processes and learning strategies (e.g., by Woll 1998, and Volterra and Erting 1990) have shown that deaf children of deaf parents acquire sign language in the same way as hearing children acquire spoken language. In the book "Sprachstörungen im Kindesalter" (Language Disorders in Childhood) by Wendlandt (2000), there are two different accounts of natural spoken language acquisition for spoken language. A chronological sequence of the ages of linguistic milestones as well as a pyramid with linguistic examples describing what a child can express at what age (See **Appendix 4** for an overview of the acquisition of the spoken language of German.) Wendlandt's overview of spoken language development is used here as a starting point for looking at the child's development of sign languages.

Some studies are based on research with children who have deaf parents and thus were exposed to sign language from birth (Baker et al., 2000). It is reasonable to assume that children with parents who are not fluent in sign language do not fit the same pattern. However, a study of American Sign Language (ASL) by Mayberry and Eichen (1991) found that there was no difference between children who had contact with ASL from birth and those who were offered fluent ASL beginning at age two (as discussed in Baker et al., 2000). I think it would be interesting to follow this study over time, considering several important influencing factors. A review by Woll (1998) can be found in **Appendix 5**: Review of British Sign Language acquisition.

Between the ages of six and ten, a child learns to tell stories. By then, most sentence structures have been acquired. In order to tell a story, a child must combine sentence structures, take on different roles, and establish a context for the content. The child develops these skills in the latter stages of the developmental period (Woll 1998). It would be interesting to compare the individual developmental stages identified for British Sign Language (BSL) with DSGS in a comprehensive study. A comparison could provide information about the sign language acquisition of a deaf child in DSGS at the different stages.

3.1.4 Criteria for age-appropriate language development

For spoken languages, there are guidelines for assessing whether a child has age-appropriate or "deviant" language development (Wendlandt, 2000). Unfortunately, as mentioned earlier, for DSGS there is little research on how sign language acquisition proceeds. We do not know exactly what a child should master at the end of each of the first years of life in order for his or her language development to be considered age-appropriate.

However, an overview of sign language acquisition can be helpful in getting a better picture. I have already referred to the statement in Baker et al. (2000) that the acquisition of signs and words occurs at the same age in both deaf and hearing children, although there are, of course, individual differences. In addition, most syntactic and morphological structures are further developed later in school. For a promotion to the next class, it is important to know if a child has a lag in sign language and if so, what could be the reason for it. Is it a "language disorder" or a problem with sensorimotor integration (i.e., a combination of sensorimotor development, social-emotional development, and intellectual abilities)? Or has previous sign language support been applied too little or too late? We know little about sign language disorders. My hypothesis is that there is often a similarity between language disorders in spoken language and those in sign language. DSGS, like spoken language, is linguistically structured on different levels. With a research study, it is possible to discover if a child makes conspicuous grammatical errors and what type of error is involved. The results of such an analysis can indicate what needs to be furthered. The Language Tree model makes clear that treating disorders of speech/signing and language, which can be seen in the crown of the tree, require strengthening of other parts of the tree. For this, the individual environmental conditions also need to be changed to some extent.

3.2 Polymorphemic verbs and classificatory handshapes in sign languages.

My focus in this study is on the development of a boy's sign language competence in relation to polymorphemic verbs with classificatory handshapes. For this, a clear definition is needed of these terms, as various alternative terms and opinions exist on this topic.

Padden (1988, 1990) divided the verbs in ASL into three categories: simple verbs, agreeing verbs, and spatial verbs. These groups differ in meaning. Furthermore, Padden argues that the agreeing verbs are influenced by person and number, whereas the markers of spatial verbs have localized meaning (Engberg-Pedersen, 1993). In **Appendix 7** is Boyes Braem's (2003) overview of the three verb groups in Swiss German Sign Language. Engberg-Pedersen (1993) writes that the major difference in Danish Sign Language is between the "polymorphemic and the non-polymorphemic verbs" with the "agreeing verbs" belonging to the latter group. Polymorphemic verbs can include morphemes of movement that are not found in the agreement verbs.

"Classifying verbs" are considered to be a subclass of the "spatial verbs" group. As with other spatial verbs, the direction and type of movement are significant in these verbs. In addition, the handshape serves to represent a group (or class) of nominal reference. Members of a class all share some kind of visual features (Boyes Braem, 2003). The theory of "classifiers" comes from research in spoken languages, and this term has become the topic of much discussion among sign language researchers in recent years. First, a brief explanation of the term "classifier" in spoken language theory will be given. Then, other authors who have also dealt with relevant aspects of classifiers will be discussed. Finally, I turn my attention to Boyes Braem's work (2003, 2004a, 2004b, 2005a, 2005b). Her definitions and terms form the basis for the present work. Boyes Braem has already done a

great deal of research on DSGS and has helped developed sign language learning materials such as the SGB sign language course levels 1 to 4³.

3.2.1 About the term classifier in spoken and signed language

Examples of classifiers in the spoken languages

In many spoken languages there is a strictly required and obligatory differentiation of masculine and feminine forms as well as of the informal "you" form and the polite form "you". In some spoken languages, there are obligatory elements that indicate whether an object is large or small, heavy or light, straight or crooked, and thick or thin. In addition, surface texture, spatial orientation, and, for example, vehicle class are marked. The spoken American Indian language Navajo uses such structures. Many of these physical properties are expressed in the morphemes of its verbs. For example, when talking about money lying someplace, the verb simultaneously informs us of the shape and consistency of the money, e.g., whether it is coins, notes, or a pile of money. In this case, a morpheme is added to the Navajo verb *lies (si)* (See the discussion of this in Boyes Braem, 1995).

Classifiers in sign languages

The term classifier first appeared in sign language linguistics in Frishberg (1975), where a classifier is seen to be realized by the handshape and hand orientation and stands for a group of nouns with the same semantic features. Sign language classifiers are expressed with a specific handshape in a group of verbs. Frishberg does not compare sign language classifiers with those of spoken language. In later studies, however, sign language classifiers have been compared with spoken languages, such as Navajo. The use of the classifier signs is mostly productive. They are also analyzable into subcomponents. Supalla (1982, 1986) and other linguists have adopted this definition (Engberg-Pedersen, 1993).

3.2.2 Other classifier systems for sign languages

Hong (2001) presents a table in her master's thesis that gives a rough overview of various classifier systems from different researchers (**Appendix 6: Other Classifier Systems**). From this it is apparent that different sign languages seem to have very similar classifier structures, although most authors group them differently. What they all do use, however, are the semantic classifiers described by Supalla (1986). Although different terms are used, they refer to the same phenomenon, namely a handshape that represents an object as a whole and reflects the location and orientation of the reference object by its orientation and movement.

3.2.3 Polymorphemic verbs with classifying handshapes from Boyes Braem

Boyes Braem (2003) provides an overview of verbs in Swiss German Sign Language. Following Padden (1990), she divides the verbs in DSGS into three groups: simple verbs, agreement verbs, and spatial verbs (**Appendix 7: Three verb groups in DSGS**) and provides

³ SGB = Schweizerische Gehörlosenbund / Swiss Federation of the Deaf. The private association GS-Media developed learning CDs for the DSGS sign language courses of the SGB. This association has since been integrated into the SGB.

examples for each group.) Boyes Braem (2003), like Engberg-Pedersen (1993), describes spatial verbs in more detail and distinguishes weak and strong polymorphemic spatial verbs. Weak polymorphemic verbs refer to the spatial verbs in which the spatial reference is to one place. In weak polymorphemic verbs, there is no possibility for a change in handshape. In strong polymorphemic verbs, not only the spatial components, but also the manner of movement and, in particular, the handshape together with hand orientation can be modified to add new or different meanings. In my study here, I am concerned with the strongly polymorphemic verbs, which involve properties such as place and manner of movement and handshape. I will predominantly use terms from Boyes Braem's discussion of DSGS. Boyes Braem (2004a, 2004b, 2005a, 2005b) divides polymorphemic verbs with classificatory handshapes into the following groups: a) location and movement verbs, and b) handling (CL-hl). Boyes Braem (2004b) provides an overview of classificatory handshapes (**Appendix 8: Classificatory handshapes in DSGS**).

Location and movement verbs

Classifying location verbs (Cl-loc)

Examples of classifying location verbs, which are translated into German with words such as "stehen"/ "to stand" and "liegen"/ "to lie", are in DSGS polymorphemic verbs with classificatory handshapes. In these verbs, the handshapes can represent several different object classes including the following: large vehicles such as buses, trucks, trains; two-wheeled vehicles such as bicycles, mopeds; people or animals. In these forms, the handshape within the verb behaves like a substitute, or a proform, for a class of objects. (E.g., for "car" or "bicycle" the proform is "it" - in English; for "person" the English proform is "they.") (Boyes Braem, 2004a, Linguistic Commentary, p. 8). Examples of classifying location (Cl-loc) verbs are given in **Appendix 9**.

Classifying movement verbs (Cl-mov)

Classifying movement verbs are also polymorphemic. "Many handshapes used to express the object classes of location verbs can also be used for verbs indicating the movement of objects in movement verbs, such as in sentences like, "It (the car, the bicycle) is moving, and she (the person) is walking"" (Boyes Braem, 2004a, Linguistic Commentary, p. 8). The orientation of the hand is often an important part of the classificatory form. The same handshape in a different hand orientation may refer to a different class of object. For example, the V-handshape in different orientations can represent a person walking, or cutting with scissors, or the overhead electrical connection for a streetcar. Other manual morphemes in the verbs of this group can express additional semantic or grammatical information include place of location, direction or manner of movement. Facial expressions can add additional semantic or grammatical information (Boyes Braem, 2004a). Examples of Movement (Cl-mov) verbs are shown in **Appendix 10**.

The spatial positions and movements of animals and humans can be represented using a group of handshapes within location and movement verbs. "Describing typical body movements of animals can be used to express various behaviors and states of animals such as fear, interest, aggressiveness, tiredness, etc. Shape descriptions are also used in the DSGS for such descriptions of animals (as well as humans)" (Boyes Braem, 2005a, Linguistic Commentary, p. 12) Examples of Classifying Handshapes for Animals in DSGS can be found

in **Appendix 11**. Sometimes it is not the whole body, but a body part which is represented by a classifier. "For example, a dog's behavior or condition is described in DSGS by portraying its tail, ears, tongue or direction of its gaze. Some of these kinds of classifiers are physical descriptions, while others are stereotypical renderings of movements that mimic typical human behavior" (Boyes Braem, 2005a, Linguistic Commentary, p. 12). For humans, the types of movements include blinking, eye shape, direction of gaze, or nature of the hair, among many others. "These forms can be used to show how different animals move on the ground, in water, and in the air. Classifying handshapes for the animals used for this purpose, often portray the shape of their feet. The movement component of the location and movement verbs in these cases reflects the stereotypical way in which the animal moves" (Boyes Braem, 2005a, Linguistic Commentary, p. 12). The same is true for reference to the location and movement of humans.

Cl-handling verbs (CL-hl)

Cl-handling verbs involve the use of various classificatory handshapes that refer to other objects, such as those with round or wide surfaces, that are being handled. As an expression of manipulation (handling) of objects, certain handshapes stand for groups or classes of objects as well as their manipulation, such as a hand, an instrument, a tool. This type of verb is considered a classifying verb because the handshape in this way also represents a class of objects. First, the object must have been accurately identified using the appropriate signs, e.g., an apple. Subsequently, an appropriate handshape is used for the "handling" verb, for example for handling small round objects such as an apple. Thus, the handling handshapes in the verbs in the following sentences all involving 'giving' are different: "I give him an apple" and "I give him a pencil" and "I give him the book." The different "handling" handshapes represent the object being handled are used (Boyes Braem, 2004a).

Facial expression and movement in movement, location and Cl-handling verbs.

Facial expression is not central to my research question. However, because polymorphemic verbs of location, movement and handling are composed of several components (morphemes), they can express simultaneously several and different meanings. A basic knowledge of facial expression and movement is also necessary for producing polymorphemic verbs with classifying handshapes. The choice of handshape depends partly on the distance from which a movement is observed and described. Near objects, for example, must be represented with the appropriate classifying handshape. For distant objects, the handshape with outstretched index finger and the appropriate direction is used for all objects in the DSGS. However, in addition to these manually represented adjectives or adverbs, specific facial expressions can add adjectival or adverbial meaning. Adjectival information about a polymorphemic verb, such as how an object moves, is often conveyed by the way the hand moves together with an associated facial expression. For example, the movement verb meaning "to fall" can express different movements depending on how large or heavy the falling object is and on what it falls (hard or soft ground, water, etc.). Signers almost always accompany such polymorphemic verbs with mouth gestures that further describe the nature of the movement. If this component is omitted, the verb would be lacking an important piece of information (Boyes Braem, 2005b). In sign languages, if a sequence of actions always refers to the same referent, the individual sequences of verbs are usually combined into one sentence. In these sequences, verbs of location and of movement with classifying handshapes are often used. The components of such verbs in

these sequences are used to indicate the basic meaning of the verb (go forward, stop, etc.) and rough directional information, but not the exact course of a movement (Boyes Braem, 2005b).

3.2.4 The acquisition of classifying forms in sign language.

Kantor (1980) did a study whose purpose was to collect data on the developmental stages that deaf children go through in acquiring the adult form of pronominal classifiers in ASL. Data were collected on production, comprehension, and imitation in sign language for nine children between the ages of three to seven. All nine children are genetically deaf and have deaf parents. In all cases, the classifiers were mastered much later than previously thought. Evidence of sequences of development was found and as well as acquisition strategies in sign language that are similar to those in spoken language of hearing children. The use of classifiers is linguistically complicated, and the signer must choose the correct syntactic, semantic, and phonological information to express the correct function of the classification. Data were collected from children's spontaneous utterances in sign language, video recordings of imitations, and data on grasping. The test focused on only three classifiers: classifiers for vehicles, two-legged animals, and tall, upright objects.

An important finding of this study is that the progression of development is dependent on linguistic ability rather than on motor ability. The youngest group (3;0-3;11) was able to recognize when a classifier was needed. They were unable to use certain handshapes for the classifiers, although they could use the same handshape in lexically simple signs. The children did, however, show a mastery of certain classifiers, which they could match to mimic test situations in which they had already used them. The intermediate age group (5;8-6;0) showed semantic expansion in the category of vehicles and syntactic environment in which the classifier was embedded. Classifiers for tall, upright as well as two-legged objects were still used in a limited way. The oldest group (6;0-7;0) used the 3-handshape for vehicles (cars, trains, trucks, parked cars) even more frequently and with more variation in context. The classifiers for tall, upright objects were used consistently. The fourth classifier, i.e., that for static objects such as bridges, was used spontaneously by subjects. The two-legged classifier - still with orientation and movement changes - now appeared more regularly. The data on grasping and imitation relied on the model that emerged in the observations on production (Kantor, 1980). I will make a comparison between Tom's production of the classificatory handshapes and the narrative structures with those of other deaf children in section 5.2.3. In doing so, I also refer to research by Schick (1990), Supalla (1982), Newport and Meier (1986), and Berman & Slobin (1994).

3.3 Narrative Aspects

Since I am using a picture story for my research, narrative structures must be considered. Although narrative structures are not central to my research question, basic theoretical knowledge of narrative structures must be involved. As mentioned in the research question, I choose two episodes from the deaf pupil's narrative. I then compare the two recordings, which I took 16 months apart. Furthermore, I then compared the pupil's narrative with that of an adult deaf person. The narrative structures may also have an impact on sign language grammar, especially also on polymorphemic verbs with classificatory handshapes and their

handling. The discussions of these data are always supplemented with data from the literature. The notion of "narrative aspects" is discussed first, followed by looking at the acquisition of narrative structures in spoken language and sign language. Similar studies on the acquisition of narrative skills are described. This is followed by an introduction to typical narrative styles that are relevant to this research.

3.3.1 Narrative structures

Herman (2006) defines the term "narrative" as a communication that describes particulars of an action, incident, or sequence of events of a story. Narrative is an important part of communication in all languages including sign language. There are different narrative styles and a limited number of structured patterns. In the context of a child's development, it is important to give a realistic context to "language use." Narrative structures also represent a universally valued academic achievement that is given much attention in the education and literacy development of hearing learners. These skills are all developed during the early school years. Vercaingne-Ménard et al. (2001) write that children make initial developmental leaps via their own associations to a story and then describe initial sequences themselves. At about age six or seven, they eventually use correct narrative structures. A well-formulated story can be described with the help of a narrative grammar which consists of at least one complete episode and includes an event with activities and at least one consequence.

3.3.2 Acquisition of narrative structures in spoken language

There is little knowledge about narrative structures used by deaf children (Herman, 2006). Herman (2006) and Vercaingne-Ménard et al. (2001) describe the process of acquiring narrative structures in spoken language which is shown in **Appendices 12a and 12b**. Berman et al. (1994) conducted extensive linguistic research in five different spoken languages (English, German, Spanish, Hebrew, and Turkish). They used the picture book; "Frog, where are you?" by Mayer (1969) to explore and compare different linguistic elements of the languages. Among other things, they also explored the developmental competency with narrative structures of different age groups in these languages. As text-free test material, a picture story such as "Frog, where are you?" provides good opportunities for the narrators to be free to choose the perspectives of events independently. There is no simple, "objective" narrative which is shown in **Appendix 13** „Development of narrative structures in spoken languages“ (Slobin et al., 2003).

3.3.3 Acquisition of narrative structures in sign language

Herman (2006) cites the observation by Morgan (1999, 2002) that there is limited research on narrative structures of adult signers' narratives. According to Hosie and Gray (1996), deaf children with late access to language have difficulty developing narrative structures. There is limited research (e.g., by Loew 1984, Morgan 1998, Morgan and Woll 2003) with children ages 4 to 12 whose first language is sign language In **Table 1** is an overview by Herman (2006) of the narrative structures of sign language:

Age	Development of narrative structures
3 years	<ul style="list-style-type: none"> ▪ The use of reference is ambiguous, with little use of sign space to make the character's identity or action clear.
4-6 years	<ul style="list-style-type: none"> ▪ Classifiers for persons and objects are used referentially in sentences, but not using the sign space consequently in these sentences. E.g., multiple speakers are shown in the same spatial location. ▪ Lack of character introduction; lack of clarity of characters; can only focus on one character. ▪ Difficulty meeting narrative time constraints
7-10 years	<ul style="list-style-type: none"> ▪ Improvement in reference; still difficulty sustaining long expositions ▪ Describing actions of different characters sequentially in overlapping gestural spaces; no indication that events are simultaneous
11-13 years	<ul style="list-style-type: none"> ▪ Complete mastery of roleplay changes.

Table 1: Overview of the acquisition of narrative structures in sign language (Herman, 2006).

Herman (2006) reports a study (Herman et al. 2004) that collected narratives from 75 deaf signing children aged 4;01 to 11;07 years in order to study the development of BSL narrative content, structure, and grammar. The goal was to obtain a standardized norm on narrative development. The 30 subjects (41 girls and 34 boys) all had sign language as their first language. Twenty-five of them were deaf children of deaf parents (DCDP), and 5 were hearing children of deaf parents (HCDP). Forty-three children were from hearing families, half of whom were bilingually schooled and half of whom grew up with Total Communication (TC)⁴. To collect data, the children first watched a videotaped dialogue in sign language. Afterwards, each child recounted the sequence of events and answered six questions about the film. These were asked by an adult whose first language is sign language. Each child's narration was videotaped and analyzed for, among other things, narrative structures. For this purpose, the following aspects were examined in more detail:

- Description of the situation through narrative episodes
- Interrelated events
- Climax of the story
- Consequence after the climax
- Evaluation of the child's reaction to the story
- Chronology

Herman et al. (2004) focus their analysis on BSL grammar, spatial verbs (including classifiers), agreement verbs, aspect, manner, and reference change (role change). They conclude that the skills of narrative structures in BSL increase significantly with advancing age. First-language signers show steady progress, while deaf children of hearing parents (DCHP) with either bilingual or Total Communication (TC) education show less consistent development. Results show correlations with gender (girls show better performance), the child's degree of hearing loss, and experience with BSL. As for hearing children, the first

⁴ Total Communication (TC) is philosophy of educating children with hearing loss that incorporates all means of communication; formal signs, natural gestures, fingerspelling, body language, listening, lipreading and speech.

components of narrative structures do not always emerge at the same age for everyone. The orientation aspect is less present in the data of younger children. The climax is described in almost all narratives. Story length and chronology gradually improve with age (as discussed in Herman, 2006).

3.4 Reference in classificatory handshapes and narrative structures.

3.4.1. Reference in sign language

Morgan (1999) writes: Sign languages are articulated in space around the signer's body. The constructions have a rich referential system that exploits linguistic, topographic, and even representational spaces. Describing ongoing scenes in which two or more events occur simultaneously requires a clear structure. In narration, signers order the sequence of events or use a clear narrative form to guide the audience through the discourse. In doing so, the narrative moves through different scenes. A complete narrative involves the activation of spaces and the cohesive movement through those spaces. A narrative in sign language has three overlapping referential frames of reference. The three representational spaces are:

1. **Narrator space:** the narrator describes the information with a direct gaze to his audience. This is especially true for the setting of the scene, the first mention of the protagonists, the plot motivation, and the appropriate introduction. This space is used throughout the narrative for comprehension checks and filler information. It can interact with the fixed and changed referential frames of reference.
2. **The fixed referential frame** is used to set up the scene. This includes topographic space, reference movement through classification, and pronominal points at spatial locations. Looking in the direction of the hands marks the use of the classification. This space interacts with the other referential reference system in exchange.
3. **The modified referential frame** is mainly used in dialogue and in describing actions and thoughts of the protagonists. The movement of an altered referential frame of reference is usually accompanied by the direction of gaze or of other non-manual markers following the locations built into the topographic space or in the fixed referential frame of reference (Morgan, 1999).

Morgan notes that previous work on referents in sign language has focused predominantly on analysis in ASL. Work on BSL (Brennan, 1986) and other European sign languages (Engberg-Pedersen, 1995; Pizzuto, 1990) has contributed to the general recognition that morphological mechanisms are used within the surrounding space and on the signer's body (cf. the discussion in Morgan, 1999). Morgan further observes that according to Slobin (1996) and others, the marking of simultaneity is also of interest in the literature. According to Bamberg (1987), Hickmann (1994), and Jisa and Kern (1997), when aspects of the discourse are simultaneous, terms from the foreground and background of events are used to describe encoding. Usually, the background event is a continuous event opposite to which a foreground event occurs. The use of temporal marking to avoid confusion of background and foreground events regulates the flow of attention for both narrator and

audience (Tomlin, 1987). The use of markers to illustrate simultaneity refers to the narrator's intention to describe various ongoing events happening simultaneously. In English, it is common to use the figurative and temporal markers of verb morphology to mark background and foreground, for example, "As he (the boy) slept, the frog climbed out of the jar" (Berman & Slobin, 1994). Silvia (1991) suggests the markings of the following conjunctions form the continuum of simultaneity: "if", "while", and "as". The preceding description of a rich referential system in BSL gives the signer, unlike the spoken language narrator, the ability to report events in a dramatic and specific way (as discussed in Morgan, 1999).

Morgan's (1999) study was focused on the use of the signing space to report on the simultaneity of occurring events in free narratives. He also used the book "Frog, Where Are You?" by Mayer (1969) and examined scene construction and movement between represented spaces and temporal devices. Morgan's findings recognized that referential forms are multifunctional in BSL. Signers use reference both to track protagonists through discourse and to organize discourse into episodes, themes, and hierarchy. For example, gaze direction can be seen as relevant to both syntax and narrative. The signing space is used throughout at all levels of discourse. This space is composed of several subsystems. In order to establish referents and maintain them in the representational space, signers use the modified and fixed referential frames of reference. The production of the overlapping representational spaces serves to encode the simultaneity of the events that occur. In discourse, adult signers rotate their bodies with ease in the signing space to change between different perspectives of events. More detailed information on the assignment and use of reference points is summarized in **Appendix 14: The Assignment of Reference Points/Loci** by Boyes Braem (2005b).

3.4.2 The acquisition of showing reference with classificatory handshapes and in narrative structures.

When a character role is used within a narrative, it is illustrated or demonstrated by constructed forms. Two areas are distinguished: constructed speech (formerly called direct speech) and constructed action. In constructed speech, the content of a character's utterance is reproduced. It is spoken in the 1st person. Constructed action is used to represent the character's action. This is carried out by means of signing in a kind of pantomime. One can compare this form of expression with non-verbal behavior in spoken language descriptions. A change in role or reference is indicated by a pause in eye contact with the audience, a change in facial expression, and a (not obligatory) change in head and body position (as discussed in Emmorey & Reilly, 1998).

Reilly et al. (1994) found that children as young as four years old first used eye contact to mark referential change and by six years old were able to indicate referential change by changing facial expressions. Reilly et al. were interested in how children learned to integrate linguistic and affective expressions. They found that young signing children used facial expressions somewhat haphazardly. They were also unable to accurately time their facial expressions with appropriate (manual) discourse (cf. the discussion in Emmorey & Reilly, 1998). Emmorey and Reilly also examined how children learn to integrate affective expressions from a different perspective. In a comparison of children's abilities in producing

constructed speech and action within a linguistic discourse were compared. Twenty-nine narratives of deaf children aged three to seven years were analyzed. In addition, ten narratives of adult signers whose first language was ASL were observed. Among them, an episode in "Frog. Where are you?" was analyzed in more detail. It was found that the narratives of three-year-old children generally did not contain much constructed speech and consisted of simple nouns or verbs. Five-year-old children produced the constructed speech with inconsistent mastery of modified facial expressions, and they often used the manual sign SAY to introduce the constructed speech. Seven-year-old children were able to correctly produce the non-manual markers for the constructed speech and the facial expression change.

Children master the linguistic mechanisms of constructed speech before those of constructed action. Seven-year-old deaf children were able to use referential alternation to indicate constructed speech, but nevertheless they did not fully master constructed action. They produced many constructions in which the facial expressions were unclear, and they break down the story into sections differently than do adults. It could be argued that children have greater difficulty manipulating the dual perspective involved in constructed action. For example, while the content of the discourse in the manual signs reflects the perspective of the narrator, the non-manual affective behaviors reflect the character's perspective.

In short, although constructed speech and the constructed action are examples of referential switching in ASL, they follow a different pattern of development (Emmorey & Reilly, 1998).

A story, or even single actions, can be told from the perspective of different viewpoints in any language. The distinction is made between the perspective of the narrator and that of a participant in the story. In DSGS, as in most sign languages, the participant form is often chosen, which is similar to a type of direct speech in spoken languages (**Table 2**).

Narrator style	Participant style
<i>I tell my husband to please buy wine.</i>	<i>I tell my husband, "Please buy wine!"</i>
The following are features in the DSGS: <ul style="list-style-type: none"> ▪ The word I refers to the narrator. ▪ The signer's non-verbal expressions reflect those of the narrator. ▪ The narrator's gaze is often directed at the addressee of the signing discourse. 	The following are characteristics in DSGS: <ul style="list-style-type: none"> ▪ The word I refers to the participant. ▪ The signer's non-verbal expressions reflect those of the participant in the story. ▪ The signer's gaze is rarely directed at the addressee of the signing discourse.

Table 2: Narrator style and participant style (Boyes Braem, 2005a)

Participant style in DSGS, as in other sign languages, can be used to express not only direct or constructed speech, but also constructed action. Because of its similarity to the roles in a play, participant style has also been referred to as "role style" (Boyes Braem, 2004a). In

DSGS, storytelling involves frequent and rapid switching between the narrative and participant styles. The perspective being taken is identified by where the narrator directs his or her gaze, i.e., to whom his or her nonverbal story expression (facial expression) is attributed and to whom the first person (I) pronoun refers. (Boyes Braem, 2005a).

4. Method

4.1 Qualitative method and longitudinal study

For my thesis, I chose a qualitative research method with the aim of analyzing two episodes of three video recordings in DSGS focusing on specific grammatical functions. For the systematic observation and assessment of sign language competence, I chose the picture story by Mayer (1969): "Frog, where are you?". In a longitudinal study, the child is followed for an extended period to collect data at different time points. The results are then compared to show development. The single informant study has the advantage that many of the variables are consistent (Baker et al., 2000). Using the two recordings from May 2005 and September 2006, I could analyze how the child's sign language competence developed during this period. I could make a differential diagnosis based on two test situations, by analyzing the child's development in DSGS in terms of polymorphemic verbs with classificatory handshapes and their handling in two different episodes of Mayer's (1969) story "Frog, where are you?" (**Appendix 15**). Subsequently, I compared the child's sign language development in the two selected episodes in terms of polymorphemic verbs with classificatory handshapes and their handling with an adult deaf person's signing of the same story. My observations and descriptions of the video recordings are related to relevant literature on the topic.

4.2 Transcription of Sign Language

A transcription must be organized in a readable form and based on the features being transcribed and can be on paper or with computer (Baker et al., 2000). The substructure of the manual part of the signs consists of four parameters: handshape, hand orientation, place of execution, and movement. Sign language has additional non-manual components (face, head, upper body) in addition to the manual components of the hand. Since sign language is a simultaneous form of communication, it is very challenging to transcribe all these components. It is also difficult to separate phonology from morphology. Stokoe (1978) referred to the differences between a spoken and a signed morpheme in his analysis of sign forms. The studies of the morphemes of spoken language are based on spoken sounds that are produced sequentially. Many morphemes in sign language, however, are produced simultaneously in a single unit. In order to analyze them, it is necessary to recognize that a sign morpheme can reflect different aspects of the same action; and this aspectual character of a sign morpheme can only be represented if in the investigation these different simultaneous components of the sign morpheme are captured and analyzed. Sign morphemes are often a physiologically and/or physically simultaneous unit and are not produced consecutively and in isolation, as is the case in languages in the spoken modality

(e.g., in English for /æ/, /k/, and /t/ for cat and tack). The aspects of a sign morpheme only make sense in connection with each other (cf. Engberg-Pedersen, 1993).

Stokoe (1991) analyzed the sign in terms of the actor, its action, and its location. The aspectual model emphasizes the similarities of the three viewpoints⁵. Each viewpoint is a different way of looking at the entity or sign. The component model provides a focus on minimal pairs and shows their independence. Stokoe's model emphasizes the view that signing is a muscular activity. Engberg-Pedersen (1993) points out that the doer and the action in a sign complement each other. Neither the aspectual model nor the component model is fundamentally disconnected from handshape. Many base forms of signs can be modified to express specific kinds of meanings. Such modifications affect the movement of the basic form, its arrangement, or the hand orientation (Engberg-Pedersen, 1993). According to Klima and Bellugi (1979), meaningful modifications of signs in ASL include types of movement and changes in space, which are not found in unmodified signs.

Klima and Bellugi (1979) separate the following five types of form changes:

1. The intensity of the movement of a sign is changed.
2. The sign is doubled.
3. The sign experiences a spatial change, e.g., the location or orientation of the hand.
4. The sign is incorporated into a movement of the hand, or an additional movement of the hand is added.
5. One-handed signs become two-handed. Signing is done with both hands either alternately or simultaneously.

Liddell and Johnson (1989) developed an analysis for ASL signs based on the idea that signs have sequential structures. Liddell and Johnson consider movement to be the most important component as it determines the segmentation of the sign flow. The greater emphasis on the movement component allows for the description of sublexical and morphological processes. Liddell and Johnson have analyzed verbs using their own method. They say that a sign can be located at different places in the signing space (loci). The locus is not a fixed point in space. In the context of polymorphemic verbs, for example, the locus expresses points or areas of signing space. The change in signs during a movement which affect the locus is important for transcription. Therefore, it is important for my work to choose a transcription method which is appropriate for annotating polymorphemic verbs. There are several ways to transcribe the DSGS data. No transcription system has yet achieved standardized status, although such a system would obviously allow for more efficient and easier data exchange (Baker et al., 2000). Sign language linguists have used several different notation systems for accurate phonetic-linguistic transcription (e.g., Stokoe notation and HamNoSys) (Boyes Braem, 2004a). I have chosen to use SignWriting symbols for the transcription of my data. Additionally, I will use glosses, which are single words of a spoken language that reflect a general meaning of the sign

⁵ In Stokoe's first analysis of ASL, the orientation of hands was not considered one of the independent form parameters of the sign.

4.2.1 SignWriting

SignWriting is a kind of "alphabet", a list of visual symbols that can be used to write any sign language in the world. Handshape together with orientation and location of the hands, and grammatically important facial expressions can be accurately recorded with special symbols." (Boyes Braem, 2004a, Introduction, p. 3). As emphasized in Liddell and Johnson (1989), it is important to describe all components of sign language in a notation. With SignWriting, one can accurately record individual signs and their components and also write down entire signed sentences and texts. For example, signs with modified beginnings and endings can be written down in a clearly recognizable way. The development of a writing system is a great challenge due to the use of three-dimensional space as well as special facial expressions. Among various notation systems, the writing system "SignWriting" by Valerie Sutton is the most developed and currently the most used internationally (Boyes Braem, 2004a). I use her platform "SignPuddle" on the Internet for transcription. More information and explanations about the symbols of SignWriting can be found on the websites www.signwriting.com and www.gebaerden-schrift.de. Since such transcriptions are very time-consuming from a technical point of view, for this study I only annotate the polymorphemic verbs with classificatory handshapes, handling, and shape description in the two different episodes of the narrative with SignWriting. The other signs in the two episodes that are not polymorphemic verbs with classifying or handling handshapes, I annotate with glosses (written words of the spoken language).

4.2.2 Glosses, transcription scheme and German translation

In order to simplify the reading of my work for readers unaccustomed to SignWriting, I also use glosses for the polymorphemic verbs with classificatory handshapes and their handling. Although the glosses are single words from a spoken language that reflect the meaning of the sign, they say nothing about the form of the sign. The sign transcription scheme also includes the following: video time-tagging, relevant non-manual linguistic cues, mouthings, a German translation of the sentence, and contextual comments.

In my master's thesis, I annotate all of my subjects' utterances that are targeted for my analysis in SignWriting and include these fuller transcripts in the thesis appendices. In the text here, which is a slightly reduced text of the original thesis, there are in **Appendices 18, 19 and 20** only some excerpts of the transcriptions as examples of my transcribing procedure using SignWriting Notation.

Traditionally, no matter which annotation system is chosen by the researcher, a tier with glosses as labels for the signs has been used. I have partly followed the glossing style of Boyes Braem (2005b) and Baker et al. (2000) to create my own version of glossing in my transcription. (See **Appendix 16** for an overview of the glosses I've used.) In the German language glosses for the DSGS signs, the uninflected base form of the German word is written in capital letters (HUND, BAUM, LAUFEN, RUFEN). Writing these words in all caps makes it clear that these words as glosses are merely "labels" and not complete translations of the signs, as glosses alone do not provide a complete translation of individual signs or a signed sentence. There remains a fundamental difficulty of using words of spoken language

to refer to signs, as a single uninflected word used may not encompass all the meanings and uses of the sign being labelled with that word. Conversely, a spoken word used as a gloss could have a meaning that the sign does not have. For this reason, if additional information is required for a sign, it is added in parentheses to the gloss: e.g., WE (we two), WE (all of us).

For polymorphemic verbs with classifying handshapes and their modifications, additional descriptive information about the sign is given. For example, the handling of an object glossed as CL-hl is also given in parentheses. Verbs involving classifiers with specific referents (also called multimorphemic features) are often glossed with the lexical propositional and content-determining referents of the spoken language. For example, the combination of a classifier with a movement verb can be glossed as follows: CI,car,-MOVE-ZIGZAG, CI,man,-WALK-ZIGZAG, or CI,bicycle,-MOVE-ZIGZAG. (Baker et al., 2000). Non-manual linguistic signals can also be part of the basic form of signs as they carry basic linguistic information. The components of the pronunciation of spoken words in sign sequences (mouthings) are included in my transcription because the mouthing of these spoken words is considered part of the respective sign language utterance (Cf. Vogt-Svendsen, 1981 for Norwegian Sign Language ; Lucas & Valli, 1989 for ASL; Pimiäa, 1990 for Finnish Sign Language; Schermer, 1990 for the Sign Language of the Netherlands; Turner, 1995 for British Sign Language. Research on mouthing in several sign languages is discussed in Baker et al. (2000) and Boyes Braem and Sutton-Spence (2001).

The German translation of the signed discourse that was made contains all the information from the original signed text, including information that cannot be conveyed by simple glosses, such as the direction of gaze and the linguistically important facial expressions.

4.3 Informant and collection of data

4.3.1 Linguistic and social background of the informant

The DSGS deaf community is small and most of its members know each other. Therefore, study results must be published in such a way that the anonymity of the participants is guaranteed. This measure also protects the deaf community as a group. My informant (described in **Table 3**) is one of six pupils of a bilingual class at the Riehen school. In my research reports, I call him Tom, which is not his real name.

<p>Tom (a boy)</p> <p>Age: 8;2 (1st video recording), 9;5 (2nd video recording)</p> <p>Nationality: CH</p> <p>Family: At home, the hearing family communicates with Tom in Swiss German Sign Language, spoken Standard German, spoken Swiss German and spoken French.</p> <p>Preschool contact with DSGS: Tom communicated in DSGS from the age of two.</p> <p>School entry: Entry into a bilingual class in Riehen: August '03, when he was 6;4 years old.</p> <p>Hearing status: Profound hearing loss from birth: Tom has worn two hearing aids since his hearing loss was diagnosed at age 1;6.</p> <p>Cognition: acceptable performance</p> <p>Motor skills: good performance in gross motor skills. Slight abnormalities in fine motor skills.</p> <p>Perception: Well-developed sense of rhythm.</p> <p>Social competence and communication: Tom is an open, communicative boy.</p>

Table 3: Description of the subject "Tom"

4.3.2 Presentation of story to be re-told and the making of the video recording

I recorded Tom's narratives in May 2006 and in September 2007. The first recording was done in one of our classrooms in the afternoon. Only Tom and I were in the room. The situation was relaxed. Tom was familiar with such situations, as I often filmed him and his classmates. Tom sat at a table where the 24 pictures (in A5-paper forms) of the selected story were laid out in the correct order. He first looked closely at the pictures. I told Tom that I was going to film him. He was looking forward to telling me the story. As for a child, 24 pictures is a lot, I divided the picture story into four episode-related groups (picture #1-7, 8-13, 14-19, 20-24). In each case, only the pictures about which he had just told something were visible to him, while the others remained hidden. The aim of the study was not to test memory performance, but to test narrative skills. His task was to tell me the story in an understandable way. He could look at the pictures but was not allowed to point with his finger to the individual elements of the pictures. To be an active communication partner for Tom, I stood behind the camera and conveyed that I was following his story by nodding often and otherwise using my facial expressions to make the situation seem as natural as possible. During the second recording, Tom sat across from another deaf person adult in the classroom who knew Tom a little bit. The procedure followed for the second recording was very similar to that for the first recording.

4.3.3 The role of the researcher and critical reflections on that researcher being me

Subjects tend to adapt their style of speaking or signing to the formality of the situation, the interaction style, and even to the intensity of a research situation. Schaerlakenes (1989), for example, has found that the presence of a researcher induces children to make longer utterances. This paradoxical observational situation which has often been discussed in sociolinguistic studies also applies to data collection in sign language. Due to the historical and long-lasting suppression of sign language, many Deaf people are still reluctant to sign when hearing persons are present. Any presence of a hearing person changes the formality of the situation and thus usually changes the Deaf person's speech production (as discussed in Baker et al., 2000). Many researchers have pointed out (for example, Deuchar, 1984) that when collecting data of sign language utterances of the deaf, all the persons present, such as the interlocutor and the cameraman, should, if possible, also be deaf in order to exclude possible influences of the presence of hearing persons. (See the discussion of this in Baker et al., 2000). One advantage of my relationship with Tom is that I am his deaf classroom teacher. Our communication is in sign language. Thus, we use the same language and operate in the same cultural context. The situation would be different if a hearing person were present, as Tom would unconsciously automatically adapt to the hearing person to be sure that this person also understands him. Tom would then use the different form of sign language that deaf people automatically use for hearing interlocutors.

4.4 Transcription and Coding

Two episodes from Tom's narratives were chosen for detailed coding and analysis: the wasp's nest (illustrations #8-12 in Episode 1) and the deer (illustrations #13-18 in Episode 2).

For my analysis, I used ELAN, a coding and transcription program that can be downloaded from the Internet. ELAN allows one to analyze a linked video recording accurately and to write an unlimited number of comments on or annotations of a videoclip, using a transcription scheme. The annotation can be a word, a gloss, a sentence, a comment, or a description of a special feature in the recording. Such annotations are thus distributed over several hierarchically organized lines (or tiers). Any part of the narration can be so transcribed and viewed in sync with the video of the signing. I organized the transcription according to different grammatical functions, such as CI-loc verbs, CI-mov verbs, and CL-hl (See **Appendix 17**: Transcription/ Tagging in ELAN. In addition to the classifier handshapes, I also annotated the other signs so that the transcription gives a complete overview. When transcribing sign language, it helps to view the recording in slow motion (Baker et al., 2000).

In addition to annotating with the ELAN program, I also developed separately my own transcription scheme for both recordings. My goal was to include in it the classifying verbs such as CI-loc verbs, CI-mov and CI-handling verbs in SignWriting notation. In this scheme, the first column lists the classifying handshapes in sign language. In the second column, each is followed by the classifying verb (CI-loc, CI-mov, and CL-hl) with its meaning. The time Tom took to make his utterances with the classifying handshapes was also noted in the transcription scheme (**Appendix 18**: Transcription scheme of the May 2005 recording (Tom: 8;2) and **Appendix 19**: Transcription scheme of the Sept. 2006 recording (Tom: 9;5).

Ideally, sign language transcription should be done jointly by deaf together with hearing researchers who have a good knowledge of sign language (Baker et al., 2000). In order to be able to fully rely on my transcription and the German translation, I worked with DSGS interpreters to revise the German translation. We had a lot of discussion about the different possibilities of translation. The goal of the translation was to translate the content as well as the grammatical errors in the child's utterances. During the transcription and analysis work, I discussed again and again with Boyes Braem about how to mark of the classifier handshapes.

5. Analysis and evaluation

5.1 Components of the analysis

The analysis is organized according to the following five groups of questions:

- a). **Which hand** (dominant hand, non-dominant hand, or both hands) uses a classifying handshape and which handshape does it use? Classification group: which classification group is used?
- b) **Reference identified:** Is the reference identified or separated before classification or after, and how? (With signs, mouthing, facial expression or pointing finger (IX) for pronouns?)
- c) **Is the classificatory handshape appropriate?** Or is it an invention? Is the classificatory handshape similar to the handshape used by a deaf adult?
- d) **Comparison of role and classification:** Is there a separation between role and classification?
- e) **Narrative structures:** How is the story structured, and how can the signer set up and change a new scene? What is the narrative style?

5.2 Results and discussion of the analyses

5.2.1 Polymorphemic verbs with classifying handshapes.

In **Table 4**, the results for both narratives are divided into two main categories:

1. Appropriate classifying handshapes for the dominant hand, both hands, or the non-dominant hand
2. Inappropriate classifying handshapes for the dominant hand, both hands, or the non-dominant hand.

For 'appropriate handshapes', there is an additional subcategory for the appropriate classificatory handshapes that are not yet produced phonologically quite correctly. The list of classificatory handshapes such as Cl-mov and Cl-loc verbs and CL-hl shows all handshapes present in this sequence of the story. The chart shows for both recordings how often Tom used the different groups of classification, and which are suitable or unsuitable classificatory

handshapes. Various charts are based on the data in **Table 4** below, "Appropriate and Inappropriate Use of Classifying Hand Shapes" for both recordings

	Appropriate and inappropriate use of the classifying handshapes (Even if phonologically not quite correctly produced)	1. Recording				2. Recording			
		approp.		inapprop.		approp.		inapprop.	
		dH 2H or ndH	dH or 2H	ndH		dH 2H or ndH	dH or 2H	ndH	
Type			*				*		
CI-mov (movement)	Insect (Wasp)	7				6			
	Person/animal (bent-V)	1				2			
	Person/Animal (V)	4				4			
	Large round object (Wasp nest)	4				2			
	Animal (Deer)	2		2		1	3		
	Animal (Dog)	5	1			4			
	Animal (Mole)	1	1						
	Single object (1)					1	1		
	Several objects (5)						1		
	Head (Mole)						1		
	Foot (Human)					2			
CI-loc (location)	Large round object (Wasp nest)	1				1			
	Round hollow object (hole)					2			
	Head (Mole)							1	
	Head (S)							1	
	Person (V)	3	2	1					
	Animal (Dog)				1	2			1
	Animal (Deer)	1	1			1			1
	Animal (Mole)	1	1						
	Tree	1				1			
	Rounded solid object (S) (brake pedal)					1			
	Flat surface (B)	1	1			3	2		
	Stem object (antlers)	1	1						
	Long round object (twig/branch)				1				1
CL-hl (handling)	Hands (round B) support themselves on long round object (branch)	1				2			
	Hands (round 5) shake big round object (tree)					1			
	Paws (bent) push against large object (tree)	2	2			1	1		
	hand (S) grasps small, long, round object (antlers)	1				2			
TOTALS		37	10	3	2	39	3	6	5
	Total number (appropriate and inappropriate)	42				50			
	Total types (appropriate and inappropriate)	17				23			

Table 4: Overview of appropriate and inappropriate use of the classifying handshapes in both recordings (approp = appropriate, inapprop = inappropriate; dH = dominant hand, ndH = non-dominant hand, 2H = both hands, * = phonologically not completely correct)

Percentage of occurrence of appropriate and inappropriate classifying handshapes at two different ages

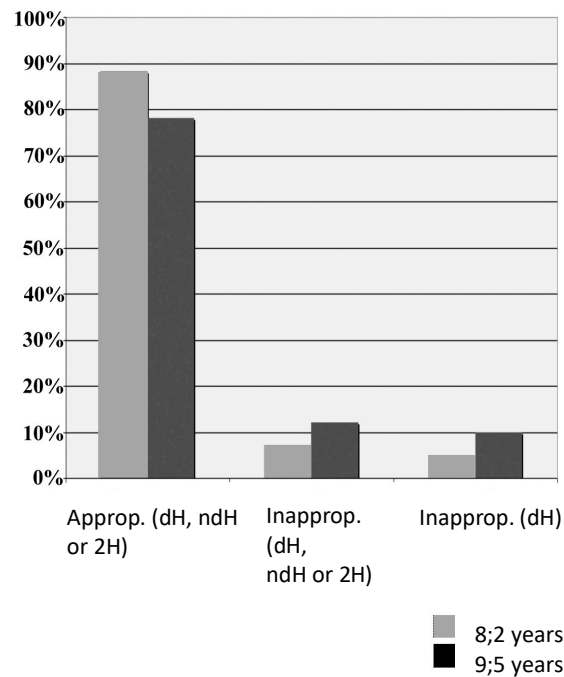


Diagram 1: Percentage occurrence of appropriate and inappropriate classifying handshapes at two different ages (8;2 and 9;5 years)

Diagram 1 ("Percent Occurrence of Appropriate Classifying Hand Shapes at Two Different Ages") is based on **Table 4** ("Appropriate and Inappropriate Use of Classifying Hand Shapes") above. This chart shows the percent occurrence of appropriate and inappropriate classifying handshapes used by Tom in the two narratives of May 2005 and September 2006.

In the first narrative, out of a total of 42 classifying handshapes, Tom used 37 correct and appropriate classifying handshapes for the dominant hand or both hands. This represents 88% of the total. In the second narrative, Tom used 39 correct classifying handshapes out of a total of 50, which is 78%. As mentioned earlier, this includes the classifying handshapes with phonological errors. This means that the handshape and hand orientation were partially correct. The classificatory handshapes with "improper execution location or movement" are reported in the **Table 5**. Although the percentage of occurrence of correctly used classificatory handshapes is higher in the first narrative, this must be seen in light of Tom's attempts to incorporate multiple and more classificatory handshapes in the second narrative (50 correct classificatory handshapes versus 42 and 23 different types versus 17).

In the second narrative, Tom used more inappropriate classificatory handshapes for the dominant hand or both hands than in the first narrative. There were 7% errors on the first recording and 12% errors on the second. Thus, Tom used more inappropriate handshapes in the second recording than in the first recording. In the second recording, he made more

errors with the non-dominant hand than in the first. In the first narrative there are 5% errors and in the second 10% errors. He has made progress with the non-dominant hand.

As we have already seen in the first chart "Percentage occurrence of appropriate and inappropriate classifying handshapes at two different ages" (**Diagram 1**), Tom made more errors in the category "inappropriate handshapes" in the second recording. He made 12 errors there and only 5 in the first recording. However, as mentioned above, we know that Tom used more correct classifying handshapes in the second recording situation than in the first and there were fewer repetitions. He had additionally acquired new classifying handshapes, but he had not yet mastered them and was still experimenting with them at the time of this recording. This led to some errors.

Classifying handshapes, inappropriate phonological location, movement and orientation errors.

As already shown in **Diagram 1** Tom made more mistakes in the category "inappropriate handshapes" in the second recording. He had 12 errors there in comparison with only 5 in the first recording. However, as mentioned above, we know that Tom in the second recording situation used more correct classifying handshapes than in the first and there were fewer repetitions. He had additionally acquired new classifying handshapes, however he had not yet master them and was still experimenting with them at that time. This led to some errors. (See **Table 5** and **Diagram 2**).

Phonological errors	1. telling	2. telling
Inappropriate	5	12
Handshapes phonologically incorrect	10	3
Location/movement incorrect	1	4

Table 5: Classifying handshapes - inappropriate phonological localization, movement and orientation errors

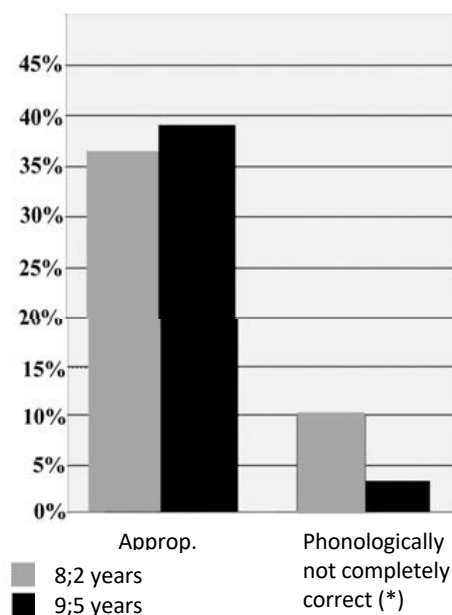


Diagram 2: Classifying handshapes: Inappropriate phonological localization, movement and orientation errors

Diagram 2 ("Classifying handshapes - inappropriate and phonologically not quite correct handshapes") also shows that Tom made more phonological errors in the classifying handshapes in the first recording than in the second recording. To me, this suggests that Tom was more confident with the already familiar classificatory handshapes in the second recording than in the first recording. By the second recording, he was mature enough to include new classificatory handshapes. This seems to me to be the reason for his errors with new classifying handshapes, as mentioned earlier. The same is true for signs with classifying handshapes that Tom used with incorrect movement, location, or orientation. For example, when describing the wasp's nest falling from the branch, he made a phonological movement error with respect to location with a classificatory index finger for a single object. Tom signed a too fast swirling falling down motion. You can see how it came about that he made multiple errors on the second recording. He was trying out new classifying handshapes and experimenting with them.

Classifying handshapes - number and types appropriate

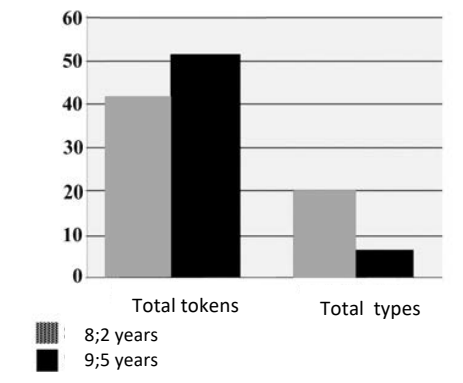


Diagram 3: *Classifying handshapes - number and types appropriate*

Diagram 3 ("Classifying handshapes - number and types appropriate") shows the appropriate number of tokens and types of classifying handshapes. Tom used classifying handshapes 42 times in the first story and 50 times in the second story. However, he used several different classifying handshapes in the second recording from September 2006 compared to the first recording. In the second recording, he used 23 different classifying handshapes, and in the first recording, he used 17 different ones. So, Tom made nice progress in the time between the first narrative to the second narrative, a period of 15 months. The column for total number of classifying handshapes and total of different classifying handshapes shows healthy, progressive development. He has a larger repertoire of classifying handshapes, and fewer repetitions are occurring. It can also be seen that Tom made more phonological errors in the first narrative than in the second and signed with more appropriate handshapes the second time. For this reason, it can be said that his second narration actually turns out better than it appears in the chart.

Classifying handshapes that are retained in the non-dominant hand

	Sign made in ndH	Retained over number of signs made by dH			
		2 signs	3 signs	4 signs	5 signs
First telling	Wasp nest	1	1		1
	Dog (leg)			1	
	<i>Subtotals</i>	1	1	1	1
	Total all forms retained in the ndH = 4				

Second telling	Dog (leg)	2			
	Hand of the boy	1			
	Paw of the dog	1			
	Deer (leg)	1	1	1	
	Tree	1			
	<i>Subtotals</i>	6	1	1	
Total all forms retained in the ndH = 8					

Table 6: *Classifying handshapes held in the non-dominant hand*

In **Table 6** ("Classifying handshapes remain in the non-dominant hand"), we can see how many signs of the dominant hand were performed as classifying handshapes in the non-dominant hand. Interestingly, Tom made great progress in this area. In the first recording, the various classifying handshapes remained in the non-dominant hand for several signs, longer than in the second recording. In the first recording, he used the non-dominant hand across five signs and only once across two signs. In the second recording, the longest sequence with the non-dominant hand lasted over four signs and six times over two signs.

Tom was able to narrate different things in less time in the second recording than in the first, where he clearly needed more narration time. For example, in the situation where the dog barks next to the deer and tells the boy to come down, Tom did exactly the same thing in both narrations. However, in the second narrative, he used the classificatory handshape for the CI-loc verb for the dog's paw across two signs. In the first narrative, this marking lasted for four signs. Tom also used CI-loc verbs with a classificatory handshape with the non-dominant hand for the deer's hooves across multiple signs with the dominant hand, using the deer's role as well as Direct Speech so that he could express the deer's thoughts. In an English translation, this is expressed as follows: "The deer looks up and wonders what could be there. He shakes his head. He thinks it is probably the boy". To express this utterance in sign language and to show that it is about the deer, Tom had decided to use both hooves for the time being and then only one hoof for the CI-loc verbs with the classificatory handshape. With the dog walking beside the deer to the precipice, Tom does the same thing in both stories, that is, he has the dog speak to the deer. In the first narrative, the dog says, "Let the boy down," and in the second narrative, "Come down, we are in this together...". Tom again chose CI-loc verbs for the classificatory handshapes of the dog's paw to show that the dog is speaking to the deer. In the second recording, Tom used eight different classifying handshapes which he retained in the non-dominant hand while the dominant hand went on to produce multiple other signs. In the first recording, there were only four classifying handshapes which were so retained by the non-dominant hand.

Appropriate and inappropriate CI-mov and CI-loc handshapes

In both narratives, Tom used more appropriate classifying movement verbs (CI-mov) than appropriate classifying location verbs (CI-loc) (See **Table 7**).

		First Telling		Second Telling	
Verb type		Total	<i>of which</i> *	Total	<i>of which</i> *
CI-mov	Tokens	26	*2	28	*6
	Types	7	*1	11	*5
CI-loc	Tokens	13	*3	16	*5
	Types	8	*3	10	*5

Table 7: *Classifying handshapes (CI-mov and CI-loc) – Total of all tokens and of those the inappropriate / incorrect tokens.*

As we also saw, Tom used more different appropriate classificatory handshapes for CI-mov and CI-loc verbs in the second recording than in the first recording. Tom also made more errors with new classifying verbs for CI-mov and CI-loc verbs in the second recording than in the first. The reason for this, as already mentioned, is that he is trying to use new classifying verbs. Repetition of classificatory handshapes also occurred less frequently in the second recording than in the first recording. Some classificatory handshapes were produced phonologically incorrectly or inappropriately because they were influenced by the signs used previously in the utterance. For example, the classificatory handshapes for the CI-loc verb of a dog's paw were influenced in the second story by barking with the O-handshape to the stretched, angled 5-handshape. The O-handshape was produced instead of the angled 5-handshape. The same is true for the classifying handshape for the head of the deer. The S-handshape was produced incorrectly and was also influenced by the previously used CI-handling verbs for grasping a small, long, round object. Interestingly, a CI-handling verb was missing from the first story. Tom told about how the wasp's nest began to sway strongly and slowly become detached from the branch. There was a missing CI-loc verb for fixing the nest to the branch and then a CI-mov verb for the wasp nest falling down.

Classifying movement verbs (CI-mov): In both recordings, Tom used the CI-mov verb with the classificatory handshape for the insects (wasps) more frequently compared to the other CI-mov verbs with classificatory handshapes (see **Diagram 4**). Tom repeated the CI-mov verb for the wasps less in the second recording.

The CI-mov verbs with the classificatory handshape for the dog that "runs" and "hops" were often used in both stories. The CI-mov verbs for the legs of animals or people (bent V-hand and V-hand) were used often in both stories. The CI-mov verb and the classificatory handshape for the running deer were used appropriately two times and two times inappropriately in the first story and one time appropriately and three times inappropriately in the second. As we can see in **Diagram 4**, Tom made mistakes in describing the hooves of the deer in the second story. The sign had a S-handshape instead of a bent B-handshape. He made the same mistake in the first story. In the first recording, phonological errors appeared in the CI-mov verb with the classifying handshape for the mole's paw. In the second story, Tom stopped using CI-mov verbs with classificatory handshapes for the mole's

paw because he wanted to use a different classificatory handshape for the mole. However, he did not succeed in doing so. The same is true for the head of the owl that flies into the sky and threatens the boy. Tom wanted to use a classifying handshape for the head of the mole that had quickly come up through the hole. But the extended-bent handshape is wrong here. For his depiction, he should have used the index finger or the closed-bent-B-handshape. He did this only in the second narrative. This is the use of the index finger as a classifier for a single object. He also used this handshape for the wasp's nest that fell from the branch. Tom tried something else new in the second narrative, and, again, he didn't really succeed. He wanted to say that many bad wasps were flying after the dog. To do this, he used the bent 5-handshape, instead of the extended 5-handshape. He had bent the 5-handshape in an attempt to indicate that the wasps are evil. In the second narrative, Tom makes a funny comparison with the braking of the deer before the precipice by using a Cl-mov verb with classifying B-handshape that one would use for the braking pedal of a car.

Classifying location verbs (Cl-loc): As can be seen in **Diagram 5**, Tom used the similar types of classifying handshapes for Cl-mov verbs as he did for Cl-loc verbs. Tom sometimes used the same classifying handshapes as for Cl-mov verbs, plus new classifying handshapes. Which handshapes he uses also depends on how he builds a story and which action is given more weight. In the first narrative, he used the wrong handshape for the dog's paws. He used the S-handshape instead of the bent-B-handshape. He used this correctly in the second story, as one can see in the table and diagram. It is interesting that Tom used the classifying handshape for the flat surface (B-handshape) more than he did in the first story. Sometimes the handshapes were a bit too indistinct and were therefore scored as phonological errors. As noted above with the Cl-mov verbs, Tom made the same mistake for the description of the mole's head. He should use an index finger or a fully closed, bent-B-handshape in place of the extended, bent-B-handshape. In the S-handshape for the deer head, the hand orientation was not correct. These examples show us that Tom is trying to incorporate new classifying handshapes into his narrative. In both stories, Tom was unable to use the correct classifying handshape for the branch of the tree where the wasp's nest hangs. In both stories, he tried two different classificatory handshapes with Cl-loc verbs for the branch but was unsuccessful.

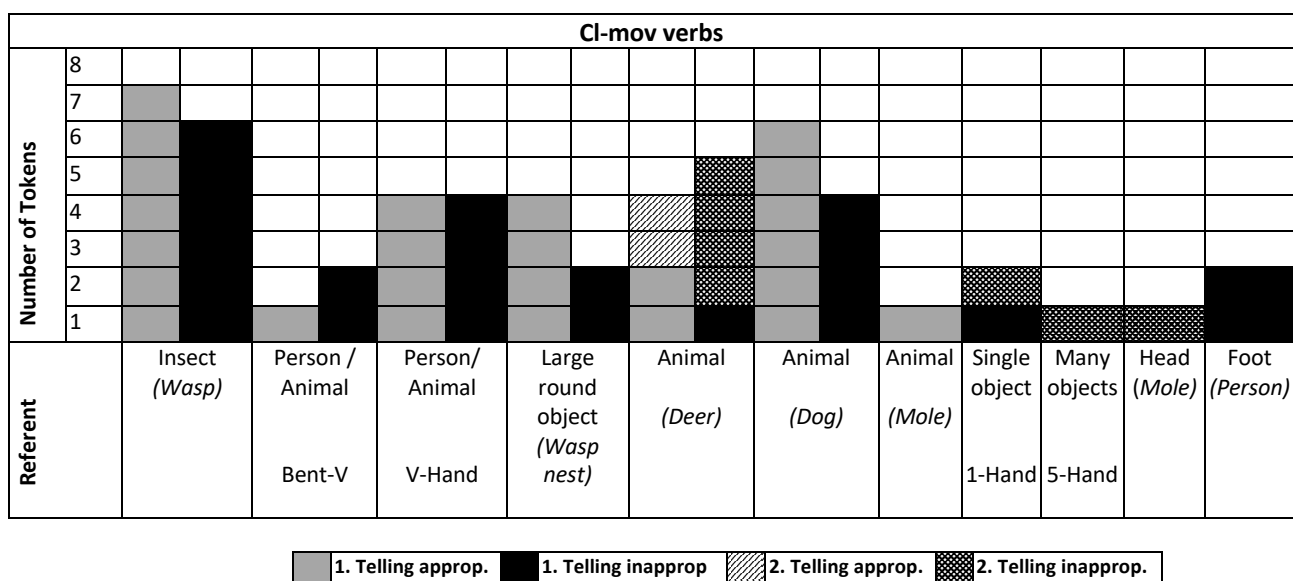


Diagram 4: Number of classifying handshapes in CI-mov verbs - appropriate and inappropriate

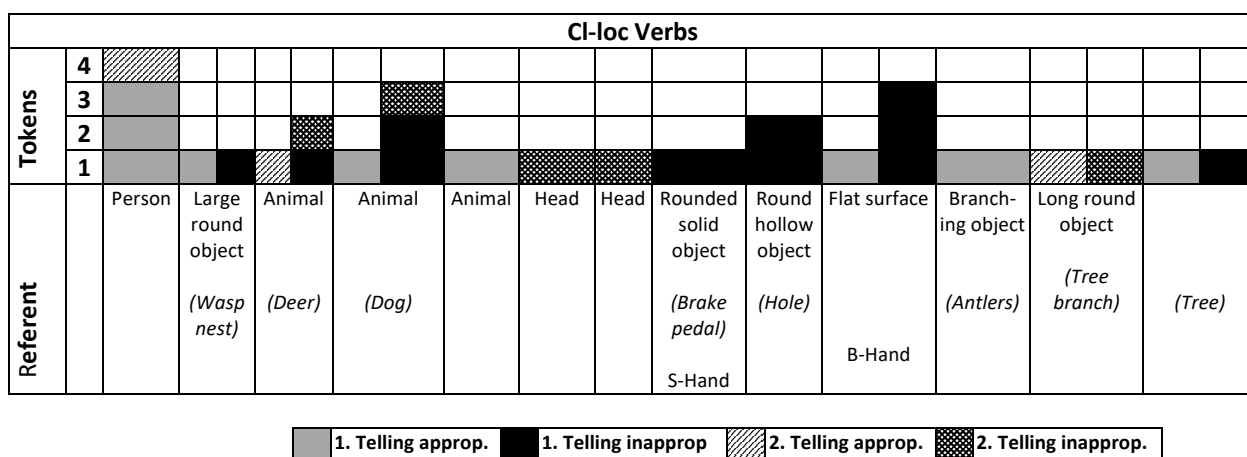


Diagram 5: Number of classifying handshapes in CI-loc verbs - appropriate and inappropriate

CI-handling verbs (CL-hl): As we can see in Table 4, the CI-handling verbs were used differently in the two stories. That is because they are based on the content and focus of the plot. In the first story, Tom used three different CI-handling verbs five times and in the second story he used four different CI-handling verbs six times. He shows some progress here. He did make the same phonological errors in both stories, such as pushing against the big tree with the dog's paws. A deaf adult would use the bent-B-handshape and not the extended bent-5-handshape or the spread-C-handshape. But you can see in the second recording that he has made progress in expressing the push. Fewer repetitions and fewer mistakes are showing up. What I find more generally interesting is that Tom is making far fewer CI-handling errors than with the CI-mov and CI-loc verbs.

General comments

Sometimes it was difficult for Tom to separate between the role and the classifying handshapes. Let's take an example at the beginning of the first episode in the first narration in which there is the dog standing by the tree. The dog is restless and bouncing on the ground. There are other examples from the first and second narratives where it is somewhat difficult to separate exactly between the role and the classifying handshape. The question is where the boundary is, or whether sometimes there really is a mixture of the two modes of representation exists.

5.2.2 Narrative structures

Tom makes greater progress with narrative structures than with classificatory verbs. Tom owes this strong progress to his cognitive and linguistic maturation between ages 8;2 and 9;5. In **Table 8**, observations are made about the narrative elements and structures in the data collected.

Narrative elements and structure	Analysis of the Data	1. Telling	2. Telling
Place	New scene - place not identified	6	1
Role play	Role play – too often and unclear	5	2
Style	Always uses the same sign	2	1
Body	Uses the whole body (when not necessary)	10	3
Reference identification	Reference identification missing	8	5
	Reference made but unclear 'who'	4	4
	Reference made but much later	2	0
Sequence	No sequencing – everything is simultaneous	4	5
	Sequencing elements missing	5	1

Table 8: *Narrative elements and structure*

Narrative is defined by Herman (2006) as a communication that describes particulars of an action, incident, or sequence of events of a narrative. As we can see in **Table 8**, Tom improved his skills in telling a story related to the factors of location, role change, style, and use of the body.

Location: In the first narrative, Tom often omitted the description of a new place or situation. In the first story, six new places were not identified. Only one place at the very beginning was described. There were no clear descriptions or indications that a new situation had occurred or that the scene had changed. There were many ambiguities throughout the narration, and at times one could not clearly follow what situation he was talking about. In the second narration, Tom gave several clear descriptions for new situations. Here it was understandable which scene he was talking about. Nevertheless, the description of a new scene was missing once. He forgot to describe the precipice before which the deer brakes, so that one can not immediately quite understand why the deer

suddenly braked. As mentioned above with the classifying handshapes, Tom compared the braking of the deer to the braking of a car. In my opinion, this was a misplaced focus. He should be directing his focus to the description of the precipice and not to the braking of the deer doing so as a car would do. This can be explained by Tom's interest in cars, as is often the case with boys his age. Although Tom frequently gave descriptions of the new situations in the second narrative, the flow of the description was not always correct. Sometimes, in general terms, the sign language grammar used in the descriptions was also not quite correct, for example, the order of the signs.

Role switching: In both narratives, Tom switched character roles very frequently compared to the adult signer. Despite this, he also shows a marked improvement in role switching from the first to the second narrative. In the first narrative he switched roles five times too much and in the second narrative he switched roles twice too much or unclearly. For both narratives, he made too many or subsequently unclear role changes for the first episode. There was no mistake in the second episode. What struck me about both narratives was that the flow of the whole story resembles the genre of an animated movie. In this kind of movie, there is very quick switching between roles from time to time. However, in sign language and also in spoken language, it is not common to switch roles of characters so frequently. You normally stay in a role longer while narrating or characterizing a person or action and do not have to change it again right away. It was noticeable to me that Tom followed the illustration frames of original story a bit too closely in his narration. This is a disadvantage of using picture stories. Retelling a movie rather than a picture book would reduce the number of changes somewhat. But then other difficulties would be involved in the creation of the test situation. The question arises of whether the sign language competence can still be tested reliably enough, if the arrangement of the film test material makes very high demands on the memory ability of the tested child and the moving picture of the film puts too much strain on the child's narrative act.

Style: In the narrations, Tom could use other sentence forms, as the narration became a bit monotonous at times. For example, he repeated himself frequently to express that the dog kept looking. The reason for the frequent repetitions was his many role changes between the dog and the boy. In part, he performed some classificatory handshapes a little too long; especially the dog's jumping and barking at the tree. Tom could not keep "the secrets" to himself in the second narrative and could not refrain from revealing something to the addressee in advance. For example, when the boy looked into the hole in the ground, Tom, having taken the role of the boy, said, "I think that's where the frog is. No, I think it's a guinea pig. Isn't it?" Tom looked at the spectator and added, "I don't think so. I think it's the frog." Suddenly, a guinea pig had emerged from the hole after all. He told the same story when the boy looked for the frog in the hole of the tree trunk. Tom took on the role of the boy wondering if there was the frog in there or maybe more likely an owl. He then looked around uncertainly - but there was nothing. And then suddenly the owl appeared.

Body: In the first narrative, Tom uses his whole body too often. For example, he often stood up or moved his whole upper body in a forward falling direction. This is atypical for the DSGS of an adult signer. He did this ten times in the first narrative but only three times in the second, indicating a strong improvement in this area.

Identification of references: Identification of references of a classifying handshape can be made before performing the classifying handshapes or after this with a sign, mouthing, facial expression, or pointing finger (IX). It was very noticeable that references were regularly missing from both stories Tom told. It was often unclear who Tom was talking about, whether it was the dog, the boy, or the mole. In the first story, he said nothing about the hole and that the mole came out of the hole. In the second story, he mentioned the hole and the mole. It became much clearer what he meant. In general, Tom's competence in using the references improved a bit. When there was ambiguity, it was often in the context of changing roles. Although one can guess who is meant, an adult would make a reference to clarify the situation. While many references were missing, Tom also used many identifying references correctly for the classifying handshapes: 17 correct references in the first narrative and 20 correct in the second.

Sequences: As can be seen in **Table 8**, Tom made great progress in the second narrative with this aspect, with just one sequence missing. In dropping the wasp's nest, he tried something new. Tom used classifying handshapes, e.g., the index finger for a single object. He forgot to show beforehand that it was the wasp's nest. Tom should have used the classifying handshape for the wasp's nest to show the first part of falling down, and only then should he have used the classifying handshape for a single object. He related in the context of the wasp's nest falling down that the wasps became angry. However, he failed to use conjunctions such as BECAUSE, THROUGH, or WHY. There was no clear context as to why the wasps got mad at the dog, who, by shaking the tree, caused the wasps' nest to fall down. There were five missing sequences in the first narrative. Finally, the movement of the classifying handshape for the wasp's nest falling down was too unclear and too short. For the dog and boy falling down into the pond, Tom only used the role of the dog and boy. It lacked a classifying handshape like the V-handshape. The same is true for the ducking of the mole into his hole. It lacked a classifying handshape for the head of the mole. Just before the wasp's nest fell to the ground, a classifying handshape was also missing for the branch from which the wasp's nest slowly detached. There was also a missing classifying handshape for the large branch on which the boy stood to look into the hole of the tree.

In both stories, Tom produced several sequences simultaneously. He made four mistakes in the first and five in the second. In the first story, one such error occurred in the 55th scene where the boy falls backwards off the branch after looking for the frog in the hole in the tree trunk and the owl startles him. Tom had a sequential problem. He combined the role for falling-on-the-back with the classifying handshape, the V-hand. He should separate these two components, marking the roll first and using the classifying handshapes afterwards, or vice versa. This is exactly how it works with the scene when the boy falls forward onto the deer's head. Tom used multiple and different hand positions of the classifying handshapes with the role. In the second story, Tom expressed the classifying handshape for the mole and the roll of the boy at the same time. However, he should have made a segmental separation between the two. Tom did something very interesting here. He combined the CI-handling of the dog's paws on the trunk of the tree and the role of the dog when the wasp's nest fell down. For this dropping down of the wasp's nest, he used a classifying handshape for a large round object. The movement performed by Tom was also very interesting. Based on his movement, it can be understood that the wasp nest fell over the dog and then down to the other side. An adult would describe this fall directly toward one side and

without crossing over. I assume Tom simply copied the exact picture of the picture of the original showing how the wasp's nest fell down. Because of this, the CI-handling of the dog's paws on the tree trunk blocked Tom's free movement possibilities for the sign showing the falling wasp's nest.

Concluding observation: Tom needed 4:15 minutes for the two selected episodes of the first video recording. For the second recording, he needed only 3:05 minutes for the same narrative. This is nice progress in the area of narrative structures. It shows that he repeated himself much less and can explain different things much more precisely and quickly.

5.2.3 Tom's classificatory handshapes compared to other deaf children

I will compare below Tom's production of classificatory verbs and narrative structures with other deaf children using other sign languages. Kantor (1980), as mentioned in Section 3.2.4, conducted a study of three- to seven-year-old deaf children of deaf parents in their acquisition of the adult form of pronominal classifiers in ASL. The oldest group (6;0 to 7;0) was able to use classifiers in context quite variably. Tom also used the classifiers for tall, upright objects repeatedly, and the bipedal classifier appeared – with orientation and movement changes – regularly. Tom meets the criteria for the six to seven age group for ASL.

Some studies of classifier development in children with sign language as their first language have focused more on the group of general classifiers than on the body classifiers (Kantor 1980, Schick, 1990, Supalla, 1982). Schick (1990) reported that deaf children of deaf parents began to use the ASL general classification system at age 4;6, despite initial errors. The generally semantically appropriate handshapes were now used selectively to represent the figure. Nevertheless, there are frequent omissions of the basic handshape: e.g., the B-handshape can represent a TABLE-SURFACE but is omitted from the CUP-ON-TABLE sentence structure. Tom increasingly used such B-handshapes in the second narrative. However, the form for SURFACE was still occasionally unclear. According to Kantor, there are difficulties in selecting appropriate classifiers at ages five to six. Complex syntactic environments that occur in connection with the use of classifiers (movement and localization) pose special problems for the child who is in the process of language development. This is also the case with Tom. His use of classifiers, their localization, and their movement sequences are still maturing. Schick (1990) mentions that children gradually acquire abstract classifiers as they mature, and they eventually are able to comprehend and actively produce them. Tom still needs to develop his existing abstract classificatory handshapes and acquire additional handshapes.

Newport and Meier (1985) report that the classification system is acquired relatively late, i.e., between the ages of three to eight years. The prerequisite for this is the ability to sort objects into semantic categories (e.g., living things, objects, plants, or vehicles) or by size and shape (e.g., straight, round, large, or small). Berman et al. (1994) report relatively early use of size and shape specifiers, which is also part of the categorization of form and function. Tom's performance is not yet fully developed in this regard.

5.2.4 Tom's narrative structures compared to other deaf children

Tom made progress in making reference during the period between the two videotaped sessions. This is consistent with his age level according to Herman et al. (2004, as discussed in Herman, 2006). The next developmental step should be for him to fully master role reversal. Herman further emphasizes that narrative structures then continue to develop with age. Children with sign language as their first language show more uniform development than children of hearing parents. In Tom's case, this the uniformity of development is only partial. His parents are hearing. He came into contact with sign language only in his 2nd year of life. In general, however, one assumes that the course of acquisition of narrative structures is very heterogeneous in both hearing and deaf children. Section 3.4.1 mentions Emmorey and Reilly's (1998) study in which it was found that seven-year-old children could correctly produce the non-manual markers for constructed speech and for facial expression change. They master the linguistic mechanisms of constructed speech before that of constructed action and are able to use referential alternation to indicate speech. Reilly et al. also mentions the differing developmental patterns of individual children. The role is not yet fully mastered. Tom's performance here is also in line with his peers. His skills are not yet fully developed.

5.2.5 Narration of the picture story by the deaf adult: Results and comparison with Tom's narration

The reason I am analyzing the performance of a deaf adult signing the same story is to make a comparison with an adult's signing and thus a benchmark to strive for. This gives me some additional theoretical grounding and shows me what Tom still needs to learn in order to achieve the narrative structures of an adult. The analysis of the adult narrative data followed the same structural examination methods as with the deaf child, with the difference that it was applied to data from an adult. (Steiner 2000). The transcription scheme of the adult's narrative can be found in **Appendix 20. Diagrams 6 and 7** are based on the data from **Table 9**, "Overview of classifying handshapes used by the adult Deaf signer." The results of the Deaf adult are only compared with the second recording of Tom, as the aim was to find out what Tom still has to learn in order to reach the level of a Deaf adult.

Adult signer: Number and types of classifying handshapes

The adult deaf person used classifying handshapes 50 times and 18 different classifying handshape types. This includes a variety of movements of the classifying handshapes. Comparing Tom's performance in the second narrative with the deaf adult, the deaf adult uses classifying handshapes much more often in these two episodes of the frog story. Tom, on the other hand, uses different types of classificatory handshapes slightly more often than the adult signer. What I noticed was that the adult person could use the different classifying handshapes with more varied movements and manners than Tom.

Types	Classifying handshapes used by a Deaf adult	All (approp. and *)	*
Cl-Mov	Insect (wasp)	3	
	Person/animal. (bent-V Hand)	8	
	Person/animal (V-Hand)	3	
	Person/animal (H-Hand)	2	
	Large round object (wasp nest)	1	
	Animal (deer)	3	
	Animal (dog)	6	
	Single object (1-Hand)	6	*1
	Long nose (H-Hand)	1	
	Cl-Loc	Many objects (5-Hand)	1
Long object with a rounded object on top		1	
Round object (tree trunk)		2	
Person (V-Hand)		1	
Person (bent V-Hand)		1	
Animal (dog)		2	
Animal (deer)		4	
Flat surface (B-Hand)		4	
HH		Branching object (antlers)	1
	Hands (rounded 5-Hand) shaking large round object (tree)	1	
Total tokens		50	*1
Total types (approp. and inapprop.)			18

Table 9: Overview: classifying handshapes used by the adult deaf person (Suitable and * unsuitable/phonologically not quite correct)

The adult deaf signer retains the non-dominant hand through 3 signs only once, but otherwise only over 2 signs each time (See **Table 10**). In total, five classifying handshapes were retained in the passive hand. Tom used a total of eight here. In the second recording, the classifying handshapes were held in the non-dominant hand for a shorter time than in the first recording. In the second narrative, he uses two holds across four signs, one hold across three signs, and six holds across two signs. Tom will likely soon know how to narrate things with classificatory handshapes in the non-dominant hand even more accurately and correctly across multiple signs.

CL-Handshape in the ndH remains	2 signs	3 signs	
Round object (Tree trunk)	1		
Animal (Dog)	1		
Animal (Deer)	1		
Flat surface (Ground)	1	1	
Total	4	1	
Total over 1->3 signs			5

Table 10: Classifying handshapes held in the non-dominant hand by the adult signer

Like Tom, the deaf adult uses more Classifying movement verbs than classifying location verbs. The choice and number of classificatory verbs depends on the focus of the story chosen by the narrator. Tom and the adult deaf signer sometimes used the same classificatory handshapes and sometimes used different ones. As an example, consider

again Tom's invention when he compares the deer abruptly halting itself to braking a car and uses the corresponding CI-mov and CI-loc verbs.

Classifying movement verbs (CI-mov): It is noticeable that the adult deaf signer often uses the classifying curved-V-handshape for the legs of people or animals, which is much less frequently used by Tom. I think Tom could have switched more between different classifying handshapes with the curved-V-handshape and if he did, there wouldn't be so much repetition. Another noticeable thing is the adult's use of the classifying 1-handshape (index finger pointing upward) for a single object. This also allows for more variety to choose from between the classifier forms. The index finger can be used to clearly represent many things and referents in a narrative. The adult puts less focus on the wasp's nest and wasps compared to Tom because the wasp's nest and wasps are only a small part of the whole story. She uses the classifying handshape for the wasp nest only once. An H-handshape for the long snout was used by the adult as a classifier for the mole. Her other handshapes are similar to Tom's. Tom used several different classifying handshapes for the mole because he paid much more attention to it than did the adult, who used only the one classifying handshape for it.

CI-mov Verbs (Adult deaf signer)										
Tokens	8									
	7									
	6									
	5									
	4									
	3									
	2									
	1									
Referent	Insect <i>(Wasp)</i>	Person/ Animal Bent V- Hand	Person/ Animal V-Hand	Person/ Animal H-Hand	Large round object <i>(Wasp nest)</i>	Animal <i>(Dog)</i>	Animal <i>(Deer)</i>	Single object 1-Hand	Many objects 5-Hand	Long snout H-Hand

Diagram 6: Classifying Handshapes (CI-mov verbs) used by an adult.

Classifying location verbs (CI-loc): The adult often uses the classificatory hand form for the flat surface (B-handshape). This is something that was not always produced correctly phonologically by Tom in the second recording. The adult deaf signer uses two new classificatory handshapes for the tree and the trunk of the tree. The other ones for these referents are similar to those used by Tom. In total, Tom uses seven classifying handshapes that were different from those used by the adult deaf signer. This depended on the focus of the story. As mentioned earlier, Tom placed his primary focus on the wasp's nest. The remaining classificatory handshapes are correctly chosen, although, as mentioned earlier, some of them were produced phonetically incorrectly and/or inappropriately because Tom was trying something new.

CI-loc (Adult deaf signer)									
Tokens	4								
	3								
	2								
	1								
Referent		Long object with round object on top (Wasp nest)	Round object (Tree trunk)	Person (V-Hand)	Person (bent V-Hand)	Animal (Dog)	Animal (Deer)	Flat surface B-Hand	Branching object (Antlers)

Diagram 7: Classifying handshapes (CI-loc verbs) used by an adult signer

CI-handling (CL-hl): The deaf adult uses only one handling sign CL-hl throughout the narrative. It was the use of a round-5-handshape when the hands had to jiggle a large, round object (tree). Tom uses four different handshapes. I think the number of CI-handling classifiers used can vary and depend on the focus and use of the narrator's role.

General remark about the narrative and structural arrangement:

Tom's difficulty in separating the role of the dog from the classifying handshape of the dog's legs was discussed earlier. Having seen the same sign in the adult signer's data, I realized that it involves a combination of the role and the classificatory handshape. Nevertheless, I wonder when a combination and when the separation is required. As sign language is a language with simultaneous components that can express many things at the same time, this is difficult to answer.

Assessment of narrative structures

The adult deaf signer recognizes which content in the narrative is important for the story line and can focus on it. Tom sometimes focuses too much on the things that interest him, such as the wasp's nest or the braking of the car.

Description of new places of action or new scenes: The adult gives clear descriptions or good hints that they are changing the scene, person, or place. Tom still has difficulty with this.

Changing roles: the adult deaf signer can effortlessly change the different roles correctly. The story is divided into five clear parts. First, she tells only about the dog and the boy who go into the forest to look for the frog. Then she tells about the boy and the mole. She continues with the dog, the tree and the wasp's nest. Then she tells about the boy, the deer and the dog. She does not even switch roles between scenes, which gives a very clear flow to the story. Tom's narration is still too reminiscent of a comic book movie, where the roles in the scenes keep switching back and forth.

Style: The adult's style is fluid throughout the narrative. There is not as much repetition as in Tom's narration.

Body: The adult narrator signs in the signing space and uses only the upper body, something which Tom has not yet fully mastered.

Reference identification: With the adult narrator it is very clear to whom or to which role she is changing, which is still difficult for Tom. Often the classifying handshapes were identified by the adult deaf person in advance, although sometimes the classifying handshape follows afterwards. Once, when referential identification occurred a little later, the narrator repeated the classifying handshape. The sign itself could indicate the reference. She uses it only when the references were clearly defined a while ago in the narration.

Sequences: The adult lacks no classifying handshape. She does not produce a classifying handshape in isolation or with a role incorrectly. Tom hasn't quite figured out what to combine or not combine and in what sequence.

General Conclusion:

The adult deaf signer takes only 1:45 minutes to narrate the episodes for which Tom needed 3:05 minutes in his second narration of the story. This represents a big decrease from the first telling, in which he needed 4:15 minutes.

5.2.6 In which areas can Tom still develop further?

The following are areas that Tom still needs to develop in order to move from the status of the second recording to the level of an adult deaf signer

Classifying handshapes:

- *Less repetition of the same classificatory handshapes.*
- *Increased correct production of existing classificatory handshapes.*
- *Expansion of the existing set of classifying handshapes.*

Narrative Structures:

- *Tom should recognize and separate important and less important things in a story. This may influence his choice of classificatory handshapes.*
- *Although he improved in this area from the first to the second narrative, better descriptions of a new place or new scenes are still needed. The flow of the description needs to be better observed.*
- *He should focus on one scene and conclude it before beginning another. The change between two scenes has been done quite correctly narratively a few times, but scene changes should not occur as frequently as in a comic book.*
- *Tom should tell narratives increasingly only in the signing space and not use the whole body as when he stands up himself instead of signing 'standing up'.*
- *All references must be identified, either before or after or with a lexical sign, but all must be identified.*
- *Once in a while, a sequence is missing. This should not be the case.*
- *Tom should tell a narrative more compactly, more precisely, and in less time. He needs to choose the right focus to use the right classifying handshapes.*

6. Concluding thoughts

It was very valuable for me to compare Tom's sign language competence with the sign language competence of an adult signer. I found that it takes much more time to analyze a child's narrative than that of an adult person. A child is still developing, and some of the narrative structures are still diffuse and complex. The results clearly showed me in which areas Tom can still develop further. This was very informative for me and helped me in furthering Tom's development.

As a summary, I would like to add a few final remarks. In Switzerland, children with a cochlear Implantation (CI) are still almost exclusively supported by spoken language. Sign language is only used when the acquisition of spoken language is not successful. Unfortunately, many educators still believe that sign language prevents spoken language acquisition. This is despite the fact that Szagun (2007) was able to disprove this with many practical examples from the USA, the UK, Israel, the Netherlands and Denmark and reports that studies have shown that the acquisition of spoken language is even supported by the acquisition of sign language (cf. Baker, Broek, Coerts & Brokx 1996; Johnston et al. 2005).

Szagun further notes that symbols have a fundamental importance for our cognitive performance. Symbols are metaphors for real events. A symbol system such as language enables us to think in abstract terms and to exchange a great deal of information in a wide variety of sentences, the modality of which, whether auditory or visual, does not matter. Szagun maintains that the risk of too slow a rate of spoken language acquisition in children with CIs means that, in addition to language ability, also thinking ability and intelligence are affected. Children with a CI who have two symbol systems (i.e., sign language and spoken language) at their disposal can benefit a great deal. Such bilingualism, she concludes, is not a problem for children.

Johnston (2006) also reports that in recent research on hearing, speaking children, research has found that children between the ages of four and six, who are reasonably good storytellers, have better language development opportunities when they are schooled bilingually in two spoken languages. I think these findings of Johnston also apply to bilingual sign language/spoken language instruction. I think one could thus also conclude that it is important that children like Tom have the opportunity to develop narrative skills first in the language they can fully understand and produce – that is, sign language.

Narratives are planned texts. They require that content and structure and cohesive language and the listener's needs be considered simultaneously in a coordinated fashion, keeping in mind the purpose and shape of the whole (p. 94) ...Virtually, any child in primary grades who has a history of language difficulties, or a current delay will profit in some respect from narrative intervention... The fact that story telling is also fun is a bonus for everyone, including us (Johnston, 2008, p. 98).

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Appendix 1: Explanations of terms

To provide clarity on some of terms used in this text, I have searched for definitions in the literature. I hope these definitions and explanations will make the reading my paper easier and provide more clarity.

Deafness

In the past, deaf people were considered exclusively to be disabled. This way of looking at things is based on the fact that from an audio-educational point of view, hearing loss, the prevention of deafness, the development of medical technology, operations to reduce deafness and experimentation with deaf people were given priority and everything was done to turn deaf people into hearing people. Hauland (2002) writes that deaf people were equated and classified with other disabled people, but an important aspect was overlooked. Deaf people have their own language. In recent years, however, academic interest in sign language and Deaf culture has increased considerably.

Today, there are different opinions about what Deafness means. Definitions depend on the perspective (i.e., medical or cultural) taken toward the term. Padden and Humphries (1988), in their publication *Deaf in America: Voices from a Culture*, write that it has become customary to distinguish between *deaf*, for a person with a hearing loss, and *Deaf*, indicating membership of a particular subculture. "Following a convention proposed by James Woodward (1972), we use the lowercase *deaf* when referring to the audiological condition of not hearing, and the uppercase *Deaf* when referring to a particular group of deaf people who share a language—American Sign Language (ASL)—and a culture". p. 2. In my teaching project, I use the term Deaf from the cultural perspective in which medically hard of hearing and deaf persons identify with Deafness and Deaf culture. In this context, the degree of hearing loss does not matter. Since DSGS (Deutschschweizerische Gebärdensprache = Swiss German Sign Language) is a natural language, it is closely connected to the culture of the Deaf in German Switzerland.

Like hardly any other disabled group, deaf persons seek their self-determination in two quite different worlds. They are born into the world of the hearing, which surrounds them on all sides, in which they live and work. It is a world they cannot hear or can hear only imprecisely, but to which they want to belong, ... a world determined by spoken language, which makes the limits of communicative competence and acceptance hard to see for the deaf. Therefore, many deaf people seek their identity in the Deaf community and often in the deaf association, which even advertises with the slogan: "The home of the Deaf is his association". Issues and problems in sign language communication play a considerable role here. (For more on this, see, among others, Fischer & Lane, 1993; Hintermair & Voit, 1990 cited in Cloerkes, 2001, p. 155-156,).

Swiss German Sign Language – Deutschschweizerische Gebärdensprache (DSGS)

I am guided by Boyes Braem`s (1995) book entitled "Introduction to Sign Language and its Research". DSGS is a distinct visual-gestural language that deaf, hard of hearing, and CODAs (Children of Deaf Adults) in German-speaking Switzerland have naturally developed within Deaf culture. Thus, sign language is the language that the deaf child can learn first and with which he or she is strongly emotionally connected. DSGS has its own grammatical and lexical

structures that have been formed over centuries of everyday communication within the Deaf community. There is no standardized DSGS but five regional dialects of the language. DSGS differs from German spoken language in vocabulary and grammar.

DSGS, like spoken language, is linguistically structured at various levels. These include the smallest meaning-distinguishing form part (phonology), the smallest meaning carrier (morphology), the relationship between words in bound utterances (syntax), and conversation (discourse). Spoken language is communicated through the oral/auditory communication channel, while DSGS uses visual/physical (manual and non-manual) means of expression. The manual means of expression are divided into four parameters: Handshape, Orientation, Location, and Movement. Changes in these parameters can also change the semantic meaning of the sign. In addition to the manual components, the non-manual and oral components play an important role in sign language grammar. The position and movement of the head, and torso, and the oral components, such as mouth image and mouth shape, can express direct and indirect speech in addition to various sentence types, adjectives, and adverbs.

Identity and culture of the deaf

On the way to finding their identity, especially during puberty, deaf young people repeatedly experience and endure highs and lows. For many people it is difficult to understand that deaf people develop a sense of belonging to their own deaf community. There they experience many commonalities and see themselves as part of the sign language culture. This is not always understood by professionals and parents, because it is contrary to the traditional and prevailing practice of deaf education, which aims only at integration into the hearing society. According to one deaf person, "Finding a niche in the deaf world has helped me interact in the hearing world. I now recognize my strengths as a deaf person and can identify and reflect on my potentials and limitations that I can use in the deaf and hearing societies" (Steward, 1991, p.39). A good self-image and identification with the community could help Deaf people to live better with hearing people. In this context, I believe that empowerment plays an important role. Empowerment is "the process of encouraging people to take their own affairs into their own hands, to discover and take seriously their own strengths and competencies, and to learn to appreciate the value of self-generated solutions" (Keupp, 1992, cited in Hintermair, 2005, p.149). That is why the availability of sign language classes at school plays an important role. In this way, deaf and hard of hearing students can get to know both languages (spoken and sign language) and cultures (culture of the hearing and deaf).

Bilingualism

A good sign language competence can, in my opinion, facilitate many everyday situations, lead to greater independence and thus optimize one's coping with life. "Bilingualists, on the one hand, argue that early sign language acquisition activates the cerebral language centers, advances children's language competence in general, and thus benefits spoken language as well. Numerous reports, e.g., from Sweden, confirm this effect" (Hänel, 2004, p. 26). Grosjean (1992) is of the opinion that a well-established first language, whether spoken or sign language, significantly promotes the acquisition of another language. Finally, sign language guarantees the deaf/hard of hearing child at least a good language base. Sign language should also be offered to hearing people as an optional subject. Hearing and deaf

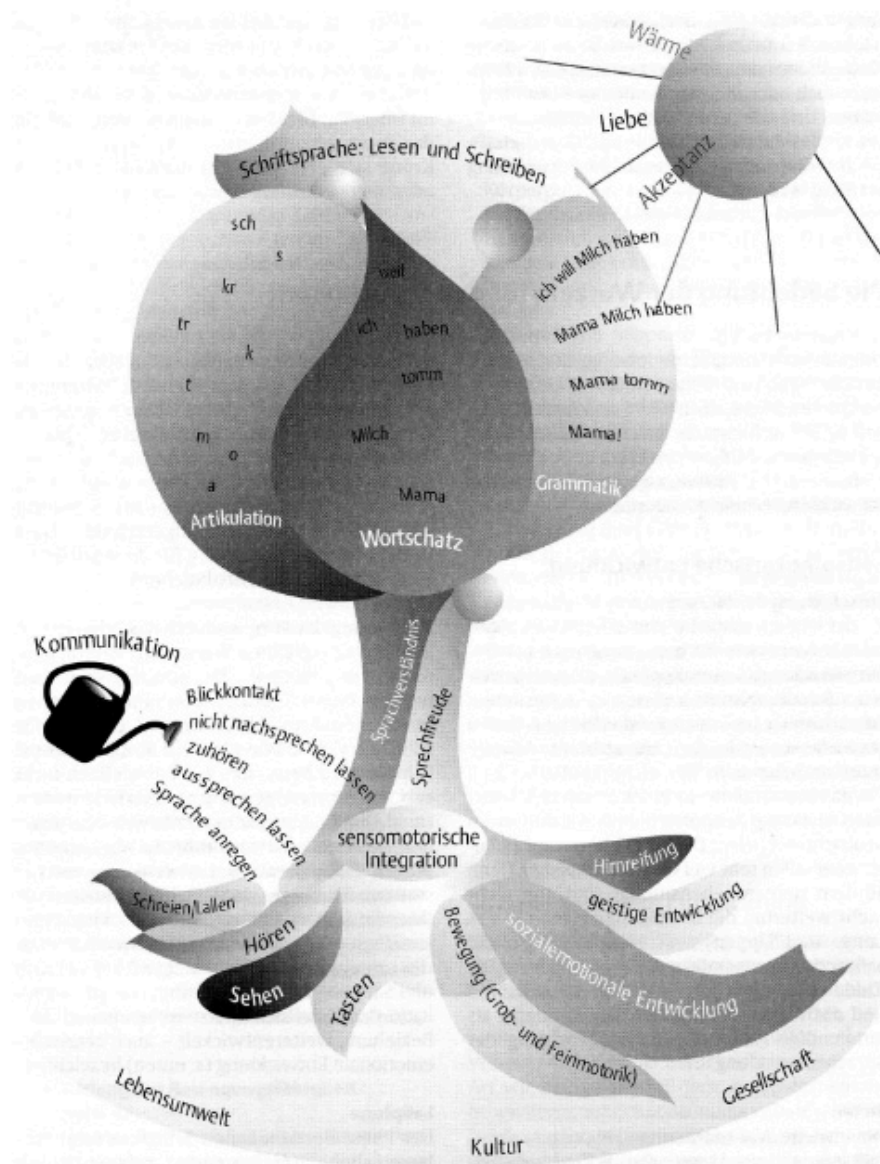
people could then communicate better with each other. With the addition of finger alphabets and some signs, hearing and deaf children could also communicate better with each other.

Bilingual education

Today, most deaf people in German Switzerland receive education according to the oral method, a method which pays no attention to sign language. Only recently has it become possible in this part of Switzerland for deaf children to have a bilingual education. However, this offer is taken advantage of for only very few children. At the time of writing this, Riehen was one school location where this was being implemented. The philosophy of bilingual education in Riehen was: "one person - one language". The bilingual education of deaf pupils in Riehen involved the following languages: DSGS and the German spoken language. The deaf pupils learned to use one or the other language, depending on the situation. The approach of the bilingual school experiment in Hamburg differed from that in Riehen. There, the choice of bilingual support was justified by the need to teach sign language competence to deaf children and to provide social-cultural as well as psychological-emotional identity functions through deaf adults as role models (Günther & Schäfke, 2004). Boyes Braem (2005) writes that bilinguals identify with those who also use two or more languages in their daily lives. The bilingual-bicultural approach in the classroom could be a solution to the language dilemma and help Deaf students perform better in school. Bilingual-bicultural education helps deaf children become more confident. Every deaf child, with or without a cochlear implantation, has his or her own language development story. With the bilingual-bicultural method one can choose one's personal "preferred" language (spoken language and/or sign language). Deaf role models play an important role in this process.

Appendix 2. The Language Tree

(Wendlandt 2000, p. 11, translated into English from the original German)



Earth: Living environment, culture, society

Roots: Crying/singing, listening, vision, touch, movement (gross and fine motor skills), social-emotional development, mental development, brain maturation

Trunk: Sensorimotor integration, language understanding, joy of speaking

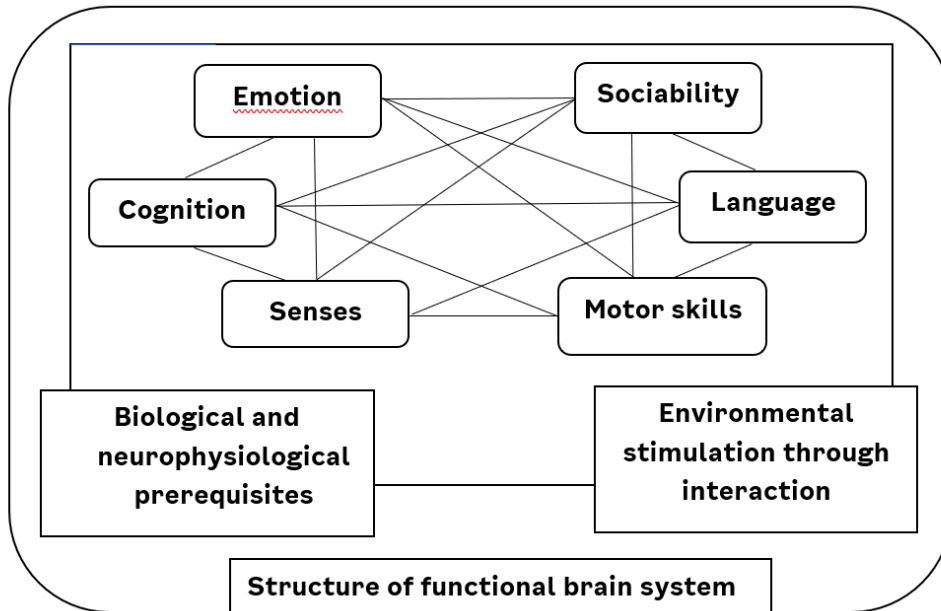
Watering can: Communication: Eye contact, do not repeat, listen, let speak, stimulate speech

The crown of the tree: Articulation: a, o, m, t, k, tr, kr, s, sch. Vocabulary: mum, milk, come, have, I, much. Grammar: mum!, mum come, mum has milk, I want milk

On the top of the crown: Written language: Reading and writing

Sky: Warmth, love, accept

Appendix 3: The underlying multidimensional development model
(Grohnfeldt, 1999, p. 20, translated into English from the original German)



Appendix 4: Overview of the acquisition of spoken German
(Wendlandt, 2000, p.22-23, translated into English from the original German)

Age	Speech utterances	Language comprehension
Newborn	Cries	Not testable
till 6 months	Baby "coos," "yips," "squeals," babbles. Beginning with guttural sounds, a series of sounds are formed in all articulation zones, often consonant compounds such as e.g., "kr."	Not testable
until 10 months	The child babbles syllables: "ba", "be", syllable doublings already occur. "gaga".	Child looks for (e.g., turns head) objects when named.
till 12 months	The child babbles monologues: "babagadenama". First "mama" or "papa".	Child responds to his or her name and to the simplest commands, e.g., "Give it to me!"
12 months until 1,5 years	The child speaks between 2 and 10 words in child language: "Balla", "Wauwau", "Mimi" (cat). The child expresses himself in "one-word sentences". It can state, request, ask, answer with one word, for example: "mommy", "have".	Fetches items when prompted. Simple prompts and questions are understood.
up to 2 years	The active vocabulary consists of 20 to 50 words. Besides nouns, activity words and property words are already used. The child begins to combine 2 and more words into utterances: "Door open"/"Mommy door open". First question age with the help of the sentence melody: "Door open?" First body parts become familiar.	Passive vocabulary is already far ahead of active vocabulary.
up to 2.5 years	Vocabulary increases rapidly. The child uses first endings for activity words and also already first past participles, without being aware of the formation of the forms. "I don't sleep." First question words ("what?" "wo") are used. Speech sounds become clearer, but the child still has considerable difficulty with initial sounds ("kl", "pl", etc.). First use of the first-person form.	The child can understand most of what he hears. Provided that speech is at a similar level.
up to 3 years	Articulation of anlaut compounds becomes increasingly better, but 3 anlauts as a compound are difficult: "plum", for example, is not yet articulated. The use of personal pronouns (I, you, he, etc.) becomes more confident, the first prepositions (on the tree) appear, and also auxiliary verbs to form the past ("I slept"). The endings of the activity words match the subject of the sentence more and more often: "I slept"; the activity word is more and more often in the right place in the sentence. First questions are already formed by rearranging the activity word and the subject: "did you sleep?" Colors are mentioned.	There are still difficulties in understanding opposites and finer gradations e.g., big-no, big-bigger.
up to 3,5 years	The sounds of the mother tongue are pronounced correctly, except for some difficult sounds (e.g., "sch") and sound combinations (e.g., "pfl"). Vocabulary continues to grow rapidly. Simple sentences are formed correctly, first subordinate and accessory clauses appear: "Mama went to the doctor and I played with Jenny". "The sp(r)itze he gave me didn't hurt." In subordinate clauses, the verb is correctly placed at the end of the sentence. Questioning age continues and is expressed primarily in many questions with "why."	The child can understand everything according to his experience.
up to 4-6 years	The child speaks fluently. Sentences are more complex. Thought processes can be expressed variably, stories can be retold. The child can count to 10 and use some abstract terms. The child makes phone calls and gives first and last names.	According to the general development, the understanding of language grows. The mother tongue is mastered in terms of feelings.

Appendix 5: Overview of British Sign Language Acquisition

(Woll, 1998)

Age	Language utterances
0;0-0;9	Babbling and gestures: The first non-linguistic large motor gestures are copies of the parents' signs. The first independent gestures occur at the end of this period.
0;9-1;0	Pointing: First non-linguistic pointing gestures to self, other persons, and objects.
1;0-1;5	Pronominal reference, vocabulary: Pointing to persons decreases at this stage, although pointing to objects is still used. The first real signs appear. They are often overgeneralized, e.g., the sign AUTO is used for car and bus.
1;6-1;11	Pronominal reference: Linguistic pointing gestures to other persons are used. Morphology: first verbs appear in the lexicon. The verb is not morphologically adapted, i.e., there is no connection between noun and verb. Syntax: The first two-sign utterances occur. The verb signs do not establish a connection between subject and object. The sequence of signs indicates the semantic relationships.
2;0-2;5	Pronominal reference: The sign YOU occurs. Sometimes it is still used incorrectly, such as DU HOLEN instead of ICH HOLEN. Pointing to the third person begins a little later. At the age of 2;5 years, clear use of pointing for first, second, and third person is realized. Phonology: the first maximal, visual contrasts of Handshapes such as index finger, closed hand and flat hand, etc. occur. There is little research on pointing and Movement. Children can already perform complex movements. There is some research from the US about the place of execution reporting that the first American signs are used first in the center of the the visual field of vision. Morphology: verbs are increasingly used in agreement but are mostly in citation form without a matching verb or produced in the unanalyzed base form. Often the inflectional rule of verbs is still overgeneralized. E.g., they usually still inflect simple verbs differently than adults do. The first morphological differences between nouns and verbs occur, but the contrast is realized incorrectly.
2;6-2;11	Morphology: The first location and movement verbs with classificatory Handshapes appear. The Handshapes are still produced incorrectly. The verbs do not yet morphologically designate certain properties correctly, e.g., via facial expression or movement change. The first productive use of agreement verbs occurs. Noun-verb pairs become excellent, but in many cases not yet produced in the adult form. Hence, much is expressed in this period via facial expressions, body position, and speed of movement.
3;0-3;5	Morphology: Inflection of the spatial verb for movement and manner appears. The children cannot yet combine them. Classifying verbs are used correctly for the first time. Agreement verbs correctly signal reference between different objects in space. First use of some numbers and morphemic aspects occurs with spatial and agreement verbs.
3;6-3;11	Phonology: lexical compounds articulated without characteristic phonological patterns occur. Morphology: spatial and agreement verbs now include movement and manner, but they are still produced sequentially rather than simultaneously. Toward the end of this period, the child begins to coordinate them. Agreement verbs are increasingly used for abstract space as well. The indications of the different references of a space are still uncoordinated.
4;0-4;11	Phonology: Novel compounds are realized, but they are neither phonologically nor semantically the same as those of the adults. Morphology: At the beginning of this period, the establishment of the space linked to references is not yet present. Increasingly, a child at this age can use abstract space. Now correct and learned inflectional rules of verbs are overgeneralized. The difference between nouns and verbs is now clear, but novel forms still appear alongside the correct forms.
5;0-5;11	Morphology: Most morphologies are mastered, although most polymorphological forms still present difficulties.
8;0-8;11	Morphology: The use of classificatory and spatial verbs is largely mastered. However, there are still some errors in the complex forms.
9;0-9;11	Morphology: The productive use of classificatory and spatial verbs is mastered.

Appendix 6: Other Classifier Systems

(Hong 2001)

Study	Classifier groups	Corresponding to Supalla's 'semantic classifiers'	Corresponding to Supalla's 'limb classifiers'
Brennan, 1992 (BSL)	SASS Tracing size and shape classifier Handling classifier Instrumental classifier Touch classifier Semantic classifier	Semantic classifier	SASS [size and shape specifiers]
Collins-Ahlgren, 1990 (Thai SL)	Whole entity handshape morphemes Surface handshape morphemes Depth, width, and shape handshape morphemes Perimeter handshape morpheme Extent handshape morphemes Instrument handshape morphemes	Whole entity handshape morphemes	
Corazza, 1990 (LIS)	Grab Surface Description Perimeter Quantity	Perimeter	
Engberg-Pedersen, 1993 (DSL)	Whole entity stems Handle stems Limb stems Extension stems	Whole entity	Limb stems
Fourestier, 1998 (LSC)	Object classifiers Classifiers for whole entities Mass classifiers Body part classifiers Handling classifiers Grasp classifiers Instrument classifiers	Classifiers for whole entities	Body part classifier
Johnston, 1989 (Auslan)	Descriptive classifier Proform classifier	Proform classifier	
Liddell/Johnson, 1987, 1996 (ASL)	Whole Entity Morphemes Surface Morphemes Instrumental Morphemes Depth and Width Morphemes Extent Morphemes Perimeter-Shape Morphemes On-Surface	Whole Entity	
Schick, 1990 (ASL)	Class Handle SASS	Class	
Shepard, Kegl, 1985 (ASL)	Shape/object classifier Handling classifier	Shape/object classifier	
















Appendix 7: Three verb groups in the DSGS

(Boyes Braem, 2003)

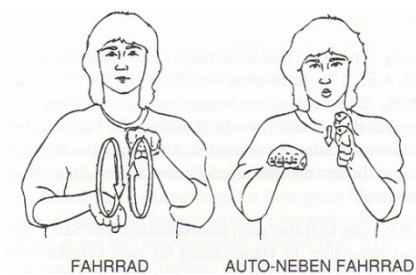
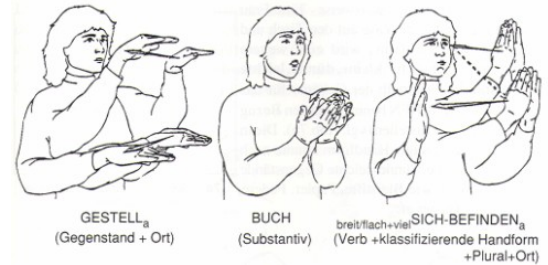
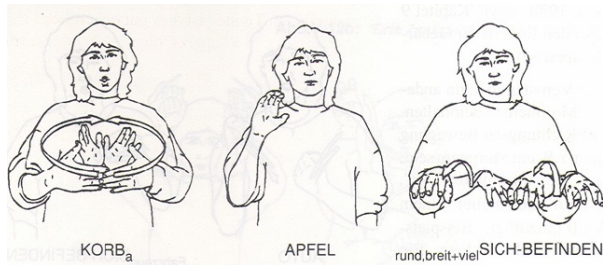
Verb group	Additional information that is built in	Base form example	Modified form example
Simple verbs	None	SCHLAFEN/SLEEP DENKEN/THINK LERNEN/LEARN LIEBEN/LOVE FALLEN/FALL	No inflected forms
Agreement verbs	Grammatical person 1 (ich) 2 (du) 3 (er)	SAGEN/SAY FRAGEN/ASK GEBEN/GIVE ANSCHAUEN/LOOK AT EINLADEN/INVITE INFORMIEREN/INFORM AKZEPTIEREN/ACCEPT	1-SAGEN-2 (Ich sage dir) 2-SAGEN-1 (Du sagst mir) 1-SAGEN-2(pl) (Ich sage euch) 1 = 1. Person, ich 2 = 2. Person, du
Spatial verbs	Location of an action Beginning and target of an action	GEHEN-HIN/GO-TO	a-GEHEN-HIN-b (Ich gehe vom Laden zur Schule) a=Lokus f. Laden b=Lokus f. Schule
	Spatial verbs with 'classifier handshapes' Class of object (Handshape) Manner of the movement (Movement)	SICH BEWEGEN/CI-mov SICH BEFINDEN/CI-loc	AUTO a-SICH_BEWEGEN-b (slowly)

Appendix 8: Classifying Handshapes.

(Boyes Braem, Linguistic Commentary, 2004a, pp. 6-8)

	Handshape & Orientation	Category/class	Example
1		Large vehicle	Auto, Truck
2		Vehicle with two wheels	Bicycle, Mofa
3		Person (standing, walking)	Person
4		Large object with salient large horizontal surface (for descriptions involving two object)	Bed, table, sofa
5		Object with salient long form (for descriptions of object in spatial locations)	Table, bed, sofa
6		Object with salient high, vertical surface	Book, piece of paper, metal plate
7		Object with salient long form	Bathtub, bench, cellphone
8		Heavy, salient rectangular object	Computer, wash machine, telephone, sofa, small sofa table, sink, WC, television
9		Large object that normally stands on a wall	Chest of drawers, cupboard
10		Handleable object with round or rounded surface	Glass, pipe, vase, bottle, post, large candle
11		Large, long, upright object	Tree (observed closeup), large poster
12		Small animals and objects	Cat, dog, chair with salient legs
13		Small	
14		Long thin object	Pencil, cigarette, tree seen from a distance
15		Object with salient flat rectangular form	Picture, card, placemat

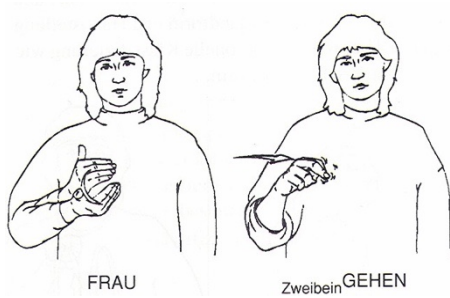
Appendix 9: Examples of Cl-loc verbs (Boyes Braem, 1995, p. 92)



Boyes Braem, 1992, S. 83, 87, 89, 90, 91

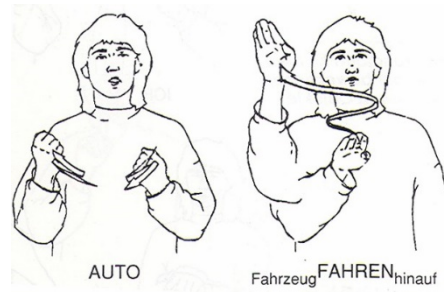
Appendix 10: Examples of Cl-mov Verbs

(Boyes Braem, 1995, pp. 86, 88)



FRAU

Zwei-bein GEHEN



AUTO

Fahrzeug FAHREN_hinauf



AUTO

Fahrzeug FAHREN_schnell-in-die-Kurve



FALLSCHIRM

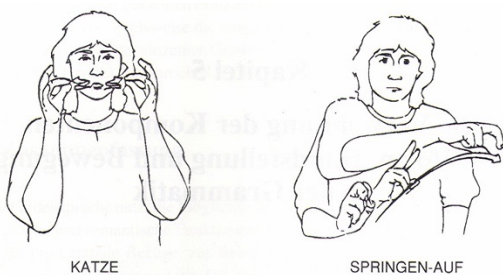
MANN_dialekt (Ztr)

Mann SCHWEBEN_herunter Fallschirm

Boyes Braem, 1992, S. 86, 88, 92

Appendix 11: Example of classificatory handshapes for animals

(Boyes Braem 1995 p.76)



KATZE

SPRINGEN-AUF



HASE

Kleintier SPRINGEN_hinauf

Boyes Braem, 1992, S. 76 und 88

Appendix 12a: Overview of the acquisition of narrative structures in spoken languages

(Herman, 2006)

Age	Development of narrative structures
2-year-olds	<ul style="list-style-type: none"> • Begins to tell of transient events • Narrative narratives are strongly structured by an adult character • Monologues
3 to 4-year-olds	<ul style="list-style-type: none"> • Refers to one or more events • Begins to use structured components of narrative structures: Local situation information ("where," not "who"), events, complications, and outcomes. • Context and sequence may not match (Greater focus on what interests them than chronology) • Very expressive • Connection "and then"
5–7-year-olds	<ul style="list-style-type: none"> • Can state where, when, and who • Understands basic emotions and intentions • Begins to build stories around a theme, logical sequence of events • Involves subplots • Understands time frame
8–10-year-olds	<ul style="list-style-type: none"> • Most structured components are used • Knows how to tell a story to another person • Still uses anaphora incompletely • Understands more complex emotions (jealousy, guilt)
10+ year-olds	<ul style="list-style-type: none"> • Complex, detailed stories are structurally coherent • Varying use of connecting links, such as "and," "then," and "when" • More concerned with holding listener's attention, adapts to different interlocutors

Appendix 12b: Overview of the acquisition of narrative structures in phonetic languages

(Vercaingne-Ménard et al., 2001)

Age	Researcher and Results			
	Applebee (1978)	Sutton-Smith (1975)	McKeough (1984, 1987)	Peterson (1990)
2-year-olds	The connection between events is missing	Free association (description of the action without context)		
3-year-olds	Classification of sequences (activities without time planning)	The main character remains throughout		
4-year-olds	Preliminary stage of narrative structures (presence of a central element), logical links (cause and effect)		Presence of narrative structures, temporal and causal connections, problem receives no solution	Temporal reference, spatial localization
5-year-olds	Thematic chain, truly central characters are linked to a sequence of events, logical temporal links	The plot is kept consistent		
6-year-olds			A problem is solved immediately, juxtaposition of events	

Appendix 13: Development of narrative structures in spoken languages (Slobin et al., 2003)

3-year-olds	5-year-olds	9-year-olds	Adult
<p>General: They fail to demonstrate proficiency in narrative structures even though they have considerable competence in the lexis and syntax of their first language.</p> <p>Interactive and personal narratives: They often digress from the content of the pictures.</p> <p>Figurative expression versus narrative emphasis: narratives are not bound to weigh the relevance of the whole or particular plot.</p> <p>Lack of temporal anchoring: The narratives do not yet follow a "red thread" which would benefit the text coherence and coherence with the grammatical tense. A temporal anchoring is prepared, which is consistently different from the moment of speech.</p> <p>Approximately one third of all adults choose the past tense. The rest choose the present tense. Younger children used the present tense, while older children would choose the past tense throughout the story.</p> <p>Correlation between utterances: They tend to focus on the spatial setting of the pictures in place of the general temporal setting. This picture-by-picture method described also shows a tendency to enumerate events or states that appear in connected picture frames.</p>	<p>General: Some constructions of narrative structures are generalized structured and thematically are motivated. Others refer only to one or at most two of the elements in the main plot. It is not possible for them to organize their narrative around the continuous search for the frog. In some, complicated syntax and a rich vocabulary emerge in the linguistic expressions. Others, however, produce juvenile-sounding texts with improvised linguistics.</p> <p>Temporal anchoring: most show clear signs of temporal organization. Underlying the structural principle is time.</p> <p>Causal connections - The discovery of concatenation: they express the idea that events occur in sequences or simultaneously. Chained causal sentences with and, then and or are often used.</p> <p>Organization of narrative segments: some children show the ability to produce well-structured narratives. They organize the chunks of their speech. Background events are clearly determined by foreground action. Progressive events are connected by a combination of partial markers, such as <i>also</i>, <i>and</i>, and <i>then</i>. They distinguish dynamic from static sentence</p>	<p>General: Nine-year-olds are 4th and 5th graders who can read and write. They have had several years of formal schooling and have been exposed to texts with narrative structures. Almost all nine-year-olds make clear reference to the two key scenes in the plot: the boy's discovery that his frog is missing and his extended search for the missing pet. Most use a sequential and/or causal connection of the partially developed events. Some, like an adult, use complete organization around a unified plot structure throughout the text.</p> <p>A twofold temporal structure: they show the capacity for quite complicated backgrounds and there is evidence of temporal transitions.</p> <p>Temporal and causal links: they still lack the fully developed ability to organize their narratives with tenses into a general plot structure that goes beyond temporal and even causal links at the spatial level of related events, i.e., in adjacent sections.</p> <p>Local and global constraints: They tend to point to causal, sequential, and other temporal relationships. This is consistent with a more general development of the ability to attribute the events of the images to background events. This is evident in the increased use of relative clauses and undefined verb forms.</p> <p>Evaluative comments on the state of mind: these interpretative comments occurred sporadically in nine-year-olds. These more developed, evaluative elements give them a taste and set them apart from the poorer, more picture-related descriptions of the younger children.</p> <p>Stereotypical construction of narrative matches: some follow</p>	<p>General: An adult narrator claims a complete narrative structure. It has been proven that there is no standard profile in narrative structures. They differ significantly in certain things: Procedure in the task, structure of the narrative and especially the form, i.e., expressive or rhetorical.</p> <p>Different attitudes and expressions in narratives: Adult narratives differ in several dimensions in any language. Adults make very individual choices, useful to them, regarding the overall repertoire, linguistic forms, and stylistic possibilities according to their first language and the narrative mode of their speech.</p> <p>Action motivation and embellishment: one of the biggest differences between adult and child narratives is that adults embed each event in an elaborate network of obstacle circumstances and narrator evaluations. Typical for the spatial level is the connection and for the temporal level when or during. They can set the scene for the listener so that the main characters express thoughts and feelings.</p> <p>Mature development of forms and functions: Adults have a richer repertoire of expressive possibilities at their disposal. This They show the capacity for thematic solidity by clearly referring to each other's different events. Adults use forms with a deictic</p>

	statements and clear temporal anchors of events with the following expressions: <i>as one day, in the morning.</i>	the course of classic fairy tales fairly closely, while others use less deliberate literary language but dialogue style. They also have an idea of what is a suitable setting for a children's picture book with a beginning, middle, and end.	sense, that is, starting from the observer. At the level of global organization, some adults provide "encapsulation" with the complete set of events.
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Appendix 14: The assignment of reference points / loci

(Boyes Braem, 2005)

Placement of a reference	Referring to a reference	Moving a reference
<p>"Locus left" and "locus right" are clearly delimited, neutral loci for absent presenters.</p> <p>The effective location of a speaker who is present is assigned to him as a reference point.</p> <p>Typical location of a non-present speaker where he/she is normally located.</p> <p>Conventionalized reference points or the status of a referent is determined by the height at which a reference point is set.</p> <p>Content dependent reference points in narratives are adapted the content of the story.</p> <p>If a new referent with a semantic relation to an already established referent is added, it is placed near the locus for the first referent.</p> <p>Sympathy or antipathy towards a referent can be expressed.</p>	<p>Pronominal reference means that an IX sign can serve as a personal pronoun (IX(er)), possessive pronoun (MY), or demonstrative pronoun (SELF), depending on its orientation and placement in relation to the locus.</p> <p>"Non-anchored signs", i.e., signs that are not signed on the body, can be performed in the area of a locus.</p> <p>The movement of agreement verbs (e.g., SAY, ASK) is coordinated with reference points in space to express agreement with grammatical persons (who, whom, whom).</p> <p>Spatial verbs use orientation or movement between loci to indicate the starting point and the goal of an action, e.g., in GEHEN (go) and many Sbw, Sbf and HH verbs with classifying hand forms.</p> <p>The direction of gaze or the orientation of the head or body (role/constructed speech/action) can be coordinated with already established reference points.</p>	<p>As a result of a movement verb, when a referent moves, its reference point also changes.</p> <p>In new episodes, when the point of view changes, the reference points also change.</p> <p>A reference point can also shift due to a change of role (narrator role/character role) of a narrator.</p>

Appendix 15: The episodes for the analysis of the Frog (Story by Mayer, 1969)

1. Episode (images 8 - 12)

1. Scene: In the forest



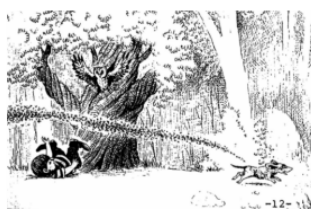
2. Scene: The dog and the wasp nest



3. Scene: The boy and the mole



4. Scene: The boy the the owl



2. Episode (Images 13 – 18)

5. Scene: the boy, the deaf and the dog



Appendix 16: An overview of the glosses in my Transcription

Description	Example – German	Example - English
Gloss (ID name for a sign)	HUND	DOG
Mouthing with a sign	MB:Hund	M:dog
A mouthing with meaning completely different from the accompanying sign	HUND (MB:weiss KOMMEN (MB: alle)	DOG (M:white) COME (M:all)
A mouth gesture	MF: pff	MG: pfff
Additional information	WIR (zwei)	ER (two)
Pointing/Indexing sign	IX(Baum)	IX (tree)
Sich-befinden-Verben	Sbf(Baum)	Cl-loc(tree)
Sich-bewegen-Verben	Sbw (Die Wespen fliegen)	Cl-mov (The wasps fly)
Handhabung	HH (Der Hund rüttelt am Stamm des Baumes)	CL-hl (The dog shakes the trunk of the tree)
Repetition of the sign	+++	

Appendix 17: Transcription / Annotation (ELAN)

Elan - Tom 5. 2005.eaf

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Empty

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nondomHd

domHd

beide Hd

klass.

HH

Pantomime

GSS

LAUFEN-galoppieren & bellen

FLIEGEN- eine

VIELE-set

FLIEGEN-viele Biene

Sbw / F-HF

Sbw / F-HF

Rolle des Hundes

GSS-Sbw

GSS-Sbw

Elan - Tom 8. 2006.eaf

Datei Bearbeiten Suche Ansicht Optionen Hilfe

Tabelle Text Untertitel Steuerung

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Geschwindigkeit: 100 0

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nondomHd

domHd

beide Hd

klass

HH

Pantomime

GSS

PHO PHO

GLA BK-au

PFOTE

GLAUB

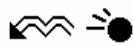
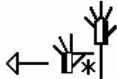
STEHEND-Hirsch WEI STEHE

Sbf Sbf- Pfoten des H



Rolle des Hirsch Rolle d

GSS- GSS GSS-KL GSS-K GSS-K

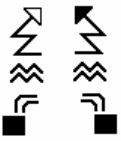

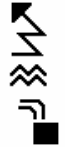
**Appendix 18: Transcription scheme of the video recording from May 2005
(Tom: 8;2)**

SignWriting	Sign	(1) Group of the classification (domHd, nondomHd and beide Hd)	(2) Reference identified? - before CL -after CL -separate	(3) CI appropriate? Invented? Adult form?	(4) Comparison Rolle vs. CI	(5) Narrative structures	Translation of the entire story. Sentences in bold are the translation of the context of the classifying sign)
	Sbw (Eine Wespe fliegt vorbei) CL-mov (A wasp flies by)	domHd/ insect (F-HS)	OK, he shows the reference with the finger on the picture and classifies then with the sign KOMMT (COME).	Ok		There is a scene or explanation of the place or situation. It begins with the boy calling out to the frog.	The boy calls for the frog. A wasp flies by.
	Sbf (Baum) CL-loc (Branch of the tree)	domHd/Baum (5-HF & Arm) domHd/Tree (5-HS & Arm) nondomHd/rundes, langes Objekt (F-HF) nondomHd/ round, long object /F-HS)	Ok, the reference is first identified with the signs IX-TREE and TREE.	An adult would rather use a round F-HS for a long round object instead of the flat F-FS			A large wasp nest hangs on a branch of the tree.

**Appendix 19: Transcription scheme of the video recording from Sept 2006
(Tom: 9;5)**

SignWriting	Sign	(1) Group of the classification (domHd, nondomHd and beide Hd)	(2) Reference identified? - before CL -after CL -separate	(3) CI appropriate? Invented? Adult form?	(4) Comparison Rolle vs. CI	(5) Narrative structures	Translation (of the entire story. Sentences in bold are the translation of the context of the classifying sign)
	Cl-mov (The boy runs in zigzags around)		No clear identification. One does not know whether it is the dog or the boy.	ok			Tom gives an explanation of the new scene and the new location. There is a description of the forest with trees and flowers. He explains that the boy is looking for his frog.
	Cl-mov (the wasps fly over the dog)		OK. The reference is identified with the sign itself and the facial expression.	ok			And there (the boy) sees a ball. Inside are wasps and they fly around.

Appendix 20: Transcription scheme of the video recording of an adult deaf signer

SignWriting	Sign	(1) Group of the classification (domHd, nondomHd and beide Hd)	(2) Reference identified? - before CL -after CL -separate	(3) CI appropriate? Invented? Adult form?	(4) Comparison Rolle vs. CI	(5) Narrative structures	Translation (of the entire story. Sentences in bold are the translation of the context of the classifying sign)
	CL-mov (The boy and dog run beside each other.)		From the sign itself, you recognize the boy and the dog.				Both of them continued walking side by side and came to a meadow where there are trees and also a forest.
	CI-mov (they run)					There is a description of the forest with trees and flowers.	
	CI-mov (they continue running)			From the sign itself, you recognize the boy and the dog from the previous part of the story			