

First Language Acquisition in Deaf Children

With a special focus on the Norwegian educational system

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This Master's Thesis is carried out as a part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.

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1 Introduction

During the master program, I attended a course in language acquisition, where I was given the opportunity to work on a topic of my choice for the entire semester. I chose impaired language acquisition in deaf children. During that semester, my interest in the field grew and I had found the topic for my master thesis. However, due to the scope of this thesis I had to narrow it down to first language acquisition in deaf children who suffer from severe (70-90db) and profound (≥ 90 db) hearing loss without cochlea implants. Linguistically, these children are challenged because they do not benefit from hearing aids or speech training. My interest is to look at linguistic input and how correct/incorrect input affects language acquisition.

The main aim of the thesis is to describe atypical language acquisition in deaf children with hearing parents. However, for a better understanding I will first introduce typical language acquisition in both hearing children with hearing parents and deaf children with deaf parents.

One of my aims is to argue that language is an innate ability (Pinker.1994, Cook & Newson.1996). Chapter 2 is an account of a typical language acquisition in a hearing child with hearing parents. I will also show how the linguistic approaches explain the rapid and effortless acquisition – innateness. A strong argument is the argument of the poverty of input (Pinker.1994), which questions how children can acquire language, and arrive at correct grammatical rules from the incomplete and incorrect input they receive, if there is not something in the human brain that makes this possible. A second strong argument is what proponents of the linguistic approaches call the critical period (Pinker.1994, Sacks.2009). This is a given time space, between birth and the age of six, when this effortless language

acquisition is possible. After age six, language acquisition becomes more difficult and often with permanent traces in e.g. accents or grammatical mistakes (Pinker.1994, Sacks.2009).

The second aim in my thesis is to show that signed languages are natural languages, and that they are acquired in the same manner as spoken languages (Easterbrooks& Baker.2002,Morford& Mayberry.2000). In chapter 3, I therefore give an account of how native signers acquire sign language as their first language, and I compare this to the typical acquisition in hearing children. Because deaf children with deaf parents and hearing children with hearing parents have the same linguistic background, I expect the same language development and acquisition.

As mentioned above, the main aim of this thesis is to describe atypical language acquisition in deaf children with hearing parents. Unlike deaf children with deaf parents and hearing children with hearing parents, deaf children with hearing parents do not have a common way of communication. Depending on when the hearing loss is discovered and, whether parents choose sign language for communicating with their children or not, deaf children will have a delayed language development. By stressing the importance of the critical period, I want to show how deaf children fail to acquire sign language without the correct linguistic input.

My fifth chapter is on bilingualism because, being part of a minority group, deaf children need to learn the majority language to function in society. Deaf children acquire/learn their two languages at different rates and with variable success, and their education play a crucial part in their language development (Berent.2004,Easterbrooks& Baker.2002). I have chosen to compare the educational systems in the USA and Norway. As for the former, much of the available research on deaf children is American, and as for the latter of my familiarity to it. In Norway, deaf children are mainstreamed in their local schools, attend sign language classes organized by the local authority and receive seminars from their regional Kompetensesenter (centre of expertise). I suspect this system to not fully benefit deaf children's needs since it

lacks professional and economic competence (Ohna.2004). I anticipate to find the same negative result in the equivalent mainstreaming system in the USA. The system I expect to find most satisfactory is the bilingual/bicultural program in the USA, in which American Sign Language (ASL) is the primary language and deaf children gain competence in ASL before they start learning English (Israelite.1992, Ratner.2009). In addition, they will gain the important cultural knowledge from both the minority and majority cultures (Israelite.1992). It is my declared aim to show that sign language is, and will be, deaf children's primary language and to emphasize that the importance of correct linguistic input must not be underestimated. In order to ensure deaf children's language development, it is important to understand *how* language works and *how* children acquire language. With one established language, sign language, the second language, the majority language, is learned far more easily.

2 Theoretical background

In this chapter I will provide the theoretical background of my thesis. Due to limitations of time and space, I have chosen to focus on linguistic approaches to language acquisition. As we will see in later paragraphs and chapters, the linguistic approaches serve best to explain the rapid and effortless language acquisition in children.¹

Even though my thesis mainly focuses on sign language acquisition, i.e. an impaired acquisition, my theoretical background is rooted in the unimpaired language acquisition in hearing children. Taking unimpaired language acquisition as my starting point, I show how both unimpaired and impaired language acquisition can be explained by the same theoretical approaches. Spoken languages are considered natural languages and research over the past decades has proven that the same holds for signed languages. Thus, if the linguistic approaches can explain the acquisition of a natural spoken language, these approaches should also explain the acquisition of a natural signed language.

In the first section of this chapter, I will - describe language acquisition in terms of “*what* happens *when*” in some detail from birth to the age of four, and I will briefly comment on later developments. In section 2.2, I will present, in some detail, Universal Grammar, the Language Acquisition Device and *how* the human brain develops and acquires language. Finally, in section 2.3 I will present the main arguments by the proponents of linguistic approaches, and I will discuss in some detail how language acquisition can be explained by these approaches.

¹ However, I do acknowledge that other theories may explain certain aspects of language acquisition better than the linguistic approaches, but I will focus on the approaches that explain the larger picture.

2.1 The course of language acquisition

Much research on language acquisition has been conducted over the last few decades, and linguists have found that children connect to language very early, in fact even before they are born (O'Grady.2007). Already in the womb, the child can hear the intonation of speech surrounding her/him. In the earliest months of their lives, children turn their heads to the source of sound and they already have a preference for the familiar language. Between three and six months of age children begin to babble and they also begin to categorize the sounds of their language. The babbling period starts with the systematic play of consonant-vowel repetitions, but later develops in length and complexity. Around their first birthday, children reach an important milestone: their first words. By that age, they understand the meaning of ca. 50 common words. The referents of these words are found in their immediate surroundings – e.g. parents/caretakers, siblings, favorite toy, pet, etc. Children will continue to babble for a few months, and tend to blend babbling and words, but gradually this will stop. Between twelve and eighteen months children produce one-word utterances. Typical one-word utterances are words which cause immediate change or action in the child's surroundings like the following examples from O'Grady (2007.115):

1. “up” meaning “I want to get up”
2. “again” meaning “Do it again”.

A one-word utterance may consist of an open class word, e.g. ‘ball’, or a pivot word², e.g. ‘want’. When the child wants to get the ball, which is out of reach, he or she, at the one-word stage, will use either ‘ball’ or ‘want’ because he or she has not yet managed to link ‘ball’ and ‘want’. When combining a single pivot word with one of the open class words, the child can successfully produce a host of utterances he or she has never heard before. Palermo's research (1971) focused on how children acquiring English struggle to make the connection between

²A pivot word can be defined as a ‘modifier’, and serve to qualify or limit the meaning of other words.

open and pivot words in their first two-word utterance, which occurs at approximately 18 months. Palermo (1971) also comes to the conclusion that open-pivot or pivot-open combinations are the most frequent two-word utterances. These combinations also reflect the systematic use of syntax. Open-pivot combinations are subject-verb, whilst pivot-open are verb-object combinations. Only 5% of children's two-word utterances violate the "correct" syntactic pattern (O'Grady.2007). Pinker (1994) points out that children's two-word combinations around the world are very similar in that – "children announce when objects appear, disappear, and move about, point out their properties and owners, comment on people doing things and seeing things, reject and request objects and activities, and ask about who, what and where" (Pinker.1994.268). At the age of 18 months, children know around 50 words and will acquire approximately one to two new words every day. At this stage, children also seem to both over- and underextend their speech. In overextension, children use one narrow concept to refer to a wider range of concepts, e.g. – the word 'dog' refers to all four-legged furry mammals, not only to dogs. Conversely, in underextension, a broad concept is applied to a narrow field, e.g. – 'animal' includes only mammals, but not amphibians, reptiles, birds etc, (O'Grady.2007). Underextensions are not so easily spotted in children's speech because they often do not have the 'correct' concept yet. Thus, it is for example 'correct' to refer to a horse as 'animal'. However, we do not know that the child's concept of 'animal' does not include snakes. Overextensions are far more easily spotted: a child refers to all furry four-legged animals as 'dog'. Over- and underextensions usually disappear from the children's speech by age two or two and a half. From the age of two, English speaking children move on to acquire articles, prepositions, and inflections for person, number and tense. With respect to the latter children are observed to overregularize, i.e. they tend to use the regular inflection *-ed* for every past tense verb, whether it is regular or irregular. We find, for example 'goed' and 'runned' instead of 'went' and 'ran' (O'Grady.2007), and the question is why do we find

these ‘incorrect’ forms. Research has shown that children early on acquire the difference between regular and irregular verb inflections. However, these inflections are stored in two different ways in the brain. The regular forms are formed by applying the acquired general rule ‘-ed is the ending of all regular past tense verbs’. Irregular inflections, on the other hand, do not follow from a general rule and the children must retrieve the specific form from their mental grammar every time they want to use an irregular verb. We see how much easier it is for a child to apply the general rule ‘-ed’ when acquiring verb inflections for past tense. The period of overregularization can last from age two up to age five. By the time the child is three years old, he or she will know how to form grammatically ‘correct’ sentences. At the age of four, children will have acquired most of the syntactic knowledge of their mother tongue. By that time, questions, negation, dependent clauses and compound sentences have also been acquired (Berko Gleason.2009). The acquisition of negatives tends to be difficult for children and they do make ‘mistakes’. The most common of them is to use ‘no’ instead of ‘not’ as in the following examples (Taken from O’Grady.2007.97)

3. “*No* singing song”
4. “*No* eating that one”

A plausible explanation for this is that ‘no’ is usually stressed at the beginning of a sentence, e.g. “*No*, you can’t have that” (O’Grady.2007.97), whereas ‘not’ is embedded and contracted to ‘n’t’ in a phrase, and does not carry stress, e.g. “I *wasn’t* watching” (O’Grady.2007.97). Children therefore hear ‘no’ much clearer and also associate negation with ‘no’. Also, children have not yet acquired auxiliaries and therefore apply the negative straight to the main verb. When children negate sentences with subject and verb, the negative will either occur between the subject and verb as in (5.), or at the beginning of the sentence as in (6.) (Both examples are from O’Grady.2007.98):

5. “Me *no* do that”

6. “No the sun shining”

Vocabulary- wise approximately twelve new words are acquired every day and children now have a total vocabulary of 8000 words. At this age, four years old, children have also acquired some pragmatic knowledge, i.e. they know how to use language in different situations. They know how to share jokes with their peers, to speak politely to grown-ups and with babies, or, in playing with dolls, they tend to simplify their speech to so-called ‘baby-talk’. At age two, children are able to recognize colors, but do not use the correct words³, and the first color words they do acquire are contrasting ones (e.g. red and green, black and white). When the child reaches the age of six and enters school, the vocabulary will have grown to 14 000 words and over the next years his or her vocabulary develops even more rapidly with a gain of twenty new words every day (O’Grady.2007). Children now conquer new milestones by learning how to read and write. They develop metalinguistic abilities and are capable of talking about the abstract and, imaginative, and they play with language (making up non existing words). Throughout life, vocabulary will develop and grow, but almost all grammatical elements have now been acquired.

2.2 The Language Acquisition Device, Innateness and Universal Grammar

“Adult speakers of any language can produce and understand sentences they have never said or heard before, simply by using a single grammatical rule and inserting various lexical items.” (Bohannon & Bonvillian.2009.237)

In 1.1, I described typical language acquisition in English speaking children and the obstacles they meet. However, even though there are obstacles, children make surprisingly few

³ Color names are acquired late by children and this happens at age four or even later (O’Grady.2007).

mistakes in the course of acquiring their first language. It is amazing that English children seem to know syntactic functions by the time they start their two-word utterances (around 18 months), or that by age six their vocabulary amounts to 14 000 words. Just imagine yourself learning twenty new words every day in a foreign language. What can possibly describe or explain how children can so acquire language so rapid and effortless?

According to Chomsky, language can be explained as an innate ability. Because children acquire language so fast and effortless, the proponents of linguistic approaches argue that language is innate.⁴ If language really is innate, Chomsky has to explain where in the human brain language is located and how it works and he proposed this in a theory called “principles and parameters” (Pinker.1994, Bohannon & Bonvillian.2009). Certain principles of language are universal and innate. Children have access to the principles via the Language Acquisition Device (LAD,) which is assumed to be a physiological part of the brain which “operates on the raw linguistic data in children’s language to produce particular abstract grammar of the children’s native tongue [...] The LAD allows children to enough innate knowledge of language to speak [...] The innate knowledge must consist of aspects of language that are universal to all languages” (Bohannon & Bonvillian.2009.239). Instead of learning *all* the rules of one specific language, children are equipped⁵ with universals valid for all languages⁵ and the universals allow children to set parameters for their *specific* language. Children listen to their mother tongue and identify and set parameters on the basis of the input they receive. Does the language have free word order with a multitude of morphological inflections, or is the word order fixed and with fewer inflections? Almost as easy as flipping a switch one way or the other (Pinker.1994), children set the parameters for their mother tongue.

As Pinker (1994) points out, Chomsky found two elements that make human language unique. First, every sentence we produce or hear is likely to be a new sentence. Since humans are able

⁴ Certain aspects of language can be explained by other theories or the future may provide us with a new theory of language acquisition.

⁵ This is valid for the languages we have knowledge of so far.

to speak and understand sentences they have never encountered before, there must be something in the human brain that enables them to create an infinite number of sentences. Chomsky named that something a ‘mental grammar’. Second, children all over the world develop a mental grammar rapidly and effortlessly, so the mental grammar, as Chomsky concludes, has to be common to all languages and therefore universal. That is to say, “universal grammar contains the system of grammatical rules and categories common to all the world’s languages” (Bohannon & Bonvillian.2009.238). This will be presented in more detail in the following section.

2.3 The arguments

From what I have described so far it may seem as though the linguistic approaches favor only the innate capacities of human beings. However, as Sacks (2009) emphasizes “one cannot acquire language by oneself [...] It is impossible to acquire language without some essential innate ability, but this ability is only activated by another person who already possesses linguistic power and competence” (Sacks.2009.49f). On the other hand, it is not the interaction itself, the linguistic approaches emphasize, but *how* the interaction starts off the innate abilities of the child.

Children set the parameters in their grammars in the early months of their first year based on the input they receive. Every day we produce a high number of ungrammatical sentences, and start, but never finish just as many. Incomplete and incorrect input is what parameter setting is based on, and is why Chomsky’s perhaps strongest argument for innateness is “the argument from the poverty of the input” (Pinker.1994.42). The input children receive is so poor that if language properties were not innate, they could not acquire their language on the basis of this input. In short, “children’s grammatical knowledge is underdetermined by the input data they

receive” (Deuchar.1987.87). However, children *do* produce sentences they have never heard before and they combine words according to grammatical rules, which they have not been taught. So simply, language must be innate because not many caregivers *teach* their children grammar. Many would argue that they use more grammatically correct sentences in interaction with their children, but very few will teach their children what a noun, or what a verb is, and how they function in the jungle of words. So the child is “not taught grammar; nor does [she or] he learn it: [she or] he *constructs* it” (Sacks.2009.65) from the poor input given by caregivers.

McNeill’s (1971) research on language acquisition strongly supports Chomsky’s view.

According to McNeill (1971), two facts give evidence that the ability to acquire language is innate: speed and abstraction. As for the former, research has shown that four-year olds indeed know most of the syntactic rules they will ever learn. As for the latter, it is clear that the abstractions children make cannot come from adult speech. The question is how children can come up with abstractions; the answer is supposedly knowledge of deep and surface structures of sentences. The deep structure of a sentence includes “all the syntactic information necessary to place the correct meaning on a sentence” (McNeill.1971.18) and the surface structure gives us “all the syntactic information necessary to place the correct pronunciation on a sentence” (McNeill.1971.18). Children somehow seem to know how to relate the deep and surface structures of sentences, but the simple fact that deep structures never appear in actual speech led McNeill (1971) to his conclusion; children must possess this knowledge innately.

Proponents of linguistic approaches have also argued that there is a critical period, i.e. a time window, during which children acquire their first language naturally. During the critical period, up to the age of six, the child is able to develop a grammar from the input he or she receives from caretakers (Sacks.2009). In the years between six and puberty, language can be

acquired with relative success, whereas in adult life, successful language acquisition is very rare (Pinker.1994).⁶

2.4 Summary

Children's language acquisition is rapid and effortless, and they are able to produce sentences they have never heard before. By approximately 18 months of age, English speaking children begin to produce two-word utterances, and only 5% of these violate the "correct" syntactic pattern of English. By the age of four, children have acquired most of the syntactic knowledge they will ever need in their mother tongue. The linguistic approaches argue that humans have innate language abilities. Children acquire principles that are universal for all the world's languages and set parameters for language specific properties from these principles. The Language Acquisition Device (LAD) is presumably a physiological part of the human brain where language is acquired. The perhaps strongest argument of the linguistic approaches is "the argument from the poverty of input" (Pinker.1994.42). The input children receive from caregivers is both incorrect and incomplete. Yet children produce sentences they have never encountered before, and how can they do that if they do not possess innate language abilities? Children are not *taught* grammar by their parents, but still manage to produce grammatically correct sentences and derive at correct grammatical rules. The proponents of the linguistic approaches also argue that children's brains are only capable of fully acquiring a language in a limited time span, the critical period, which lasts from birth to age six. From age six, language acquisition will become more difficult and the language will have permanent traces of a delayed acquisition.

⁶ I will return to this matter in chapter 3.

3 Sign language acquisition

“*Why* is the uneducated deaf person isolated in nature and unable to communicate with other men? *Why* is he reduced to this state of imbecility? Does his biological constitution differ from ours? Does he not have everything he needs for having sensations, acquiring ideas, and combining them to do everything that we do? Does he not get sensory impressions from objects as we do? Are these not, as with us, the occasion of the mind’s sensations and its acquired ideas? *Why* then does the deaf person remain stupid while we become intelligent?” - Abbé Sicard, grammarian and principle of the institutes for deaf in Bordeaux and Paris (Sacks.2009.13)

This chapter is divided into two larger sections – one about native signers (3.1) and one about non-native signers (3.2). The first section, will describe the course of language acquisition for children who acquire sign language from birth. It will become clear that sign language is acquired in the same effortless manner as verbal language and that hearing and deaf children with a typical language development will reach the same milestones at the same time. In the second section, on the other hand, we see how deaf children with an atypical language development struggle with acquiring sign language as their first language. These children are considered to be non-native signers (or late signers) because they do not begin to acquire/learn sign language before they start school. In this section, I address in some detail self-created sign systems and manually created sign systems. Self-created systems are developed by children themselves and are further developed with parents, but they are rarely understood by outsiders. Manually created systems were developed in the 1970s to create a bridge between sign language and English. These systems are used in many homes and schools. Important to note is that none of these systems are *natural languages*.

Signed languages have existed for centuries, and sign language research has been going on for decades, but there are still many common misapprehensions. Signed languages are natural languages and just like their spoken counterparts they are members of language families and they may or may not be mutual intelligible.

Spoken and signed languages are different in the most basic manner. A spoken language relies on the oral/auditory abilities, while a signed language relies on the manual/visual abilities. As a consequence, it was expected that sign language acquisition would also differ from spoken language acquisition. However, as we shall see in section 3.1, there are no radical differences in acquiring signed or spoken language.⁷ As alluded to in chapter 2 there should be no difference in the acquisition of spoken and signed languages since they are both groups of natural languages.

3.1 Native signers

A very small number of deaf children are born into signing families. Deaf children with deaf parents are estimated to constitute only 10% of the world's deaf population (Goldin-Meadow.2003). Signing parents will communicate with their children (deaf or hearing) by using sign language, and the children naturally acquire sign language very much in the same way as hearing children acquire spoken languages (Goldin-Meadow & Mylander.1985). In this chapter I will therefore refer closely to the acquisition stages deaf and hearing children have in common.

Gestures in the prelinguistic stage illustrate important similarities between deaf and hearing children. Both hearing and deaf children use symbolic gestures in their early communication as infants. These gestures appear at the same time as hearing children produce their first

⁷ Research has also shown that hearing children with spoken and signed input perform equally well in both languages, reaching the same milestones at approximately the same time, and show no preferences for either language (Petitto.2000).

spoken words. Characteristically, gestures are used in everyday situations and for requests, and they seem to play an important role in children's language acquisition (Schirmer.2000). In 3.2 I will present a more detailed account of the usage of gestures.

Deaf children move from prelinguistic gesturing to performing manual syllabic babbling which occurs at 7-10 months of age. This is an activity which differs from other hand activity of the child because it “possess (1.) a restricted set of phonetic units (unique to signed languages), (2.) syllabic organization, and it was (3.) used without meaning or reference” (Petitto.2000.45). Like in spoken language, manual babbling is organized around the syllable, which is realized by a rhythmic opening and closing of hands and arms (Petitto.2000). The discovery of this pattern indicates that manual babbling really is something else than gestures and other hand movements, just like syllabic babbling in spoken languages differs from earlier babbling.

In figure 1.below we see the natural handshapes that are universal for all children, deaf or hearing. The handshapes we see in figure 2 can easily be traced back to the natural handshapes, and parents can early spot resemblances of letters and signs. When taking figure 3. into consideration, it might look like deaf children have a remarkable early knowledge of letters. However, the alphabet is based on the universal and natural handshapes. To see the big picture one can combine the equivalents in each drawing and explain this by saying that: 1 \approx A \approx A, 2 \approx S \approx S, 3 \approx L \approx L, 4 \approx bO (baby O) \approx O (here we see an example of the child simplifying a sign because the fine motor skills have not developed enough to yet make the O-shape with the whole hand, only with the thumb and index finger), 5 \approx 5 \approx 5, 6 \approx C \approx C and G \approx I or 1 (there are two possible explanations for this ‘baby’ sign. First, it can mean I, made with a simplification. The fine motor skills necessary to perform the sign with the little finger are not yet developed and the sign is therefore made with the index finger. Second, the sign can mean 1.).

Figure 1. Natural handshapes in children⁸

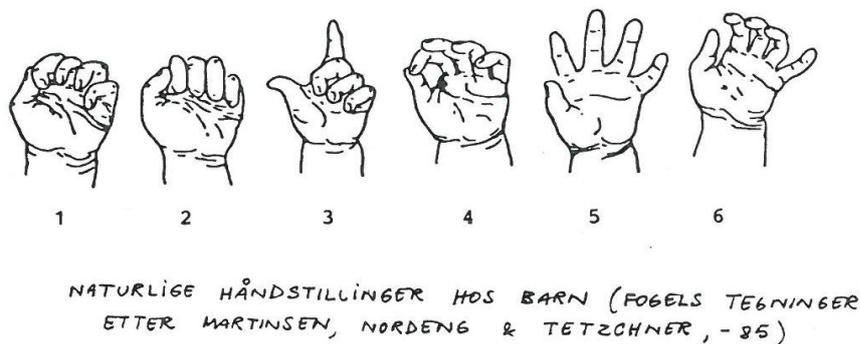


Figure 2. Handshapes in early signs⁹

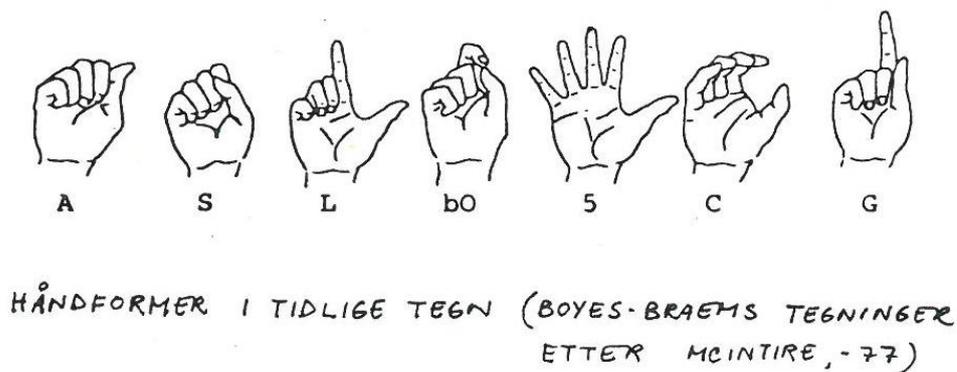
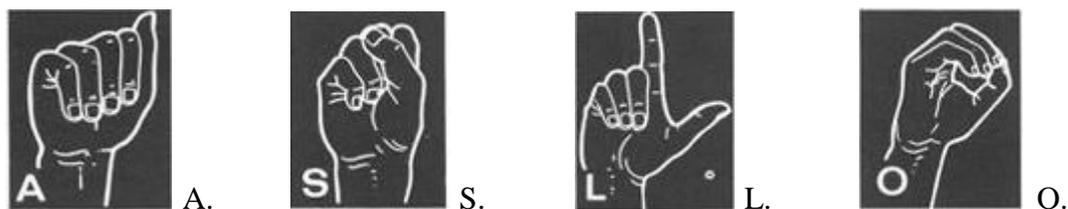


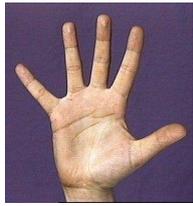
Figure 3. Letters in the international hand alphabet (one-handed)¹⁰



⁸ From Øhre.1987.19

⁹ From Øhre.1987.19

¹⁰ The letters are from http://gordon.acm.no/vgs/1_tegnspraak/pdf_bilder/internasjhandalfabet.pdf. Last accessed 04.06. 2011. The numbers are from <http://www.lifeprint.com/asl101/pages-signs/n/numbers1-10.htm>. Last accessed 04.06. 2011.



5.



C.



I.



1.

When reaching the age of 11-14 months, the deaf child will produce his/her first signs.

However, the child does not immediately use signs in their referential context. It is only at about approximately a month after their first signs that they start to clearly use signs “to name or indicate objects and actions in their worlds” (Goldin-Medow.2003.33) Typically, the first referential signs will denote toys, food, animals, clothing and people in their close surroundings. In this respect, manual signs are very similar to hearing children’s first spoken words.

Just like their hearing peers, deaf children over- and underextend the meaning of words, usually around the age of two. They will overextend by using the sign DOG for every furry four-legged animal, or underextend by using the sign for DOG only to refer to the family’s dog.

Research has shown that children have difficulties with combining the handshape, place of articulation and the movement of signs at first. Deaf children seem to more often sign the handshapes incorrectly than use the wrong place of articulation. The different places of articulation are perhaps more distinct than the handshapes. It is also easier for adults to spot irregularities in handshapes than in place in articulation (Conlin et. al.2000).

Clusters in both spoken and signed languages occur, and both hearing and deaf children will avoid or simplify words with clusters. Deaf children will solve their clusters by using simpler handshapes. This simplification may occur because their fine motor skills have not developed fully yet. The brain may have acquired a word, but the hands have not matured sufficiently to perform a complicated ‘pronunciation’. Hearing children may avoid to produce clusters

altogether and delete the difficult sound or replace it with a familiar sound. 'Blanket' to "banket" or 'bump' becomes "bup" (O'Grady.2007.154). We find simplified constructions in usage of negation as well. As mentioned in 1.1, hearing children have problems placing the negative at the correct place in a sentence and we often hear sentences like (1.) "No singing song" and (2.) "No eating that one" (O'Grady.2007.97). Deaf children's usage of negation is the mirror image of hearing children's use of negation; the sign NO¹¹ simply precedes the sign they want to negate or a simple headshake will signify that something is to be negated.

Pointing has a special function in sign languages, but deaf children start off like their hearing peers by using pointing as a *gesture* and playing with its function. At 10 months of age both hearing and deaf children use pointing in a limited way: - the child will never point to something that is not already in connection to the conversation. When the child then reaches one year of age, he or she will start playing with names (with sender, receiver and an outer referent), e.g. during family dinners when naming parents and siblings, and when looking at photos or picture books. Researchers have actually found a certain pattern as to what children point to in their early stages in life (Øhre.1987):

1. Something which is more than one meter away, either new to the child or occurs in an unexpected situation (e.g., the neighbor has got a new dog, or the neighbor's dog is coming running towards the child)
2. Not new or unexpected things, but pictures of well-known objects (e.g., family photos)
3. Not new or pictured objects, but imagined hypothetical things where the child points to the location of the item (e.g., the child has previously seen an airplane in the sky and now points to the sky to refer to an airplane).

Between 12-18 months, deaf children realize that pointing is not a mere gesture in their language, but rather a linguistic unit. They may, for some months stop using pointing gestures

¹¹ I will use the standard representation of signs, capital letters (e.g. CAR), and give the English equivalent in lowercase letters and single quotation marks (e.g. 'car').

altogether, but when they restart to use them, then as *linguistic units* (pointing *signs*) of their language and not prelinguistic gestures (Goldin-Meadow.2003).

Pronoun reversal (Goldin-Meadow.2003) is something that occurs in both hearing and deaf children. It seems like a common misapprehension for both groups to confuse ‘me’ and ‘you’: Why do you say ‘you’ to me, and ‘me’ to yourself? Between 12-18 months deaf children go through a period where they stop using points to refer to people and start the reversal of pronouns. When other people sign to the child they use the sign YOU, a point sign from the signer’s body towards the addressee, the deaf child makes the wrong generalization and take the YOU sign to actually be the sign for ‘me’. Between 25-27 months, pronouns reversal is overcome and the child will correctly use the ME and YOU signs. Interestingly, the pronoun reversal period actually occurs at the same time as the child discovers pointing as a linguistic unit (Goldin-Meadow.2003).

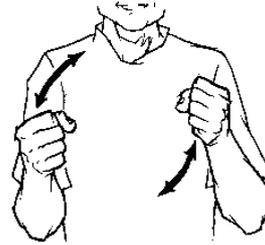
Research on non-native adult signers¹² has shown that the more iconic the signs are, the easier they are to learn and to remember (Conlin et.al.2000). Early research on language acquisition in deaf children predicted the same development. However, only one-third of the children’s early signs are iconic, and these are similar to the words hearing children also produce in their early linguistic language. One possible reason for this is that children simply cannot see the iconicity in the signs, and therefore learn words typical for child language in general (Goldin-Meadow.2003). The children do not see the parallel between the word ‘bicycle’ and the sign BICYCLE, which is made up by the fists making a circular pedaling motion (see drawing 4. below), or the word ‘car’ and the sign CAR, which depicts moving the steering wheel (see drawing 5. below)

¹² These are adults learning sign language as a second language after the critical period.

Figure 4. BICYCLE¹³



Figure 5. CAR¹⁴



The unmarked word order in American Sign Language (ASL) is subject-verb-object (SVO), and this word order is usually used in conversations including non-native signers because it reflects the word order in English. However, word order variation is possible e.g. when a constituent is topicalized and moved to the beginning of the sentence (Goldin-Meadow.2003). Deaf parents emphasize the teaching of the unmarked word order early in language development. This in order to understand how constituents are related to each other both in ASL and English. The children will later learn how to use other word orders, e.g. in topicalization or question formation.

As seen above, deaf children exposed to sign language from birth do not lag behind in language acquisition at all. There are even indicators that deaf children acquire sign language faster than hearing children acquire spoken language. The reasons may be that (1.) children reach control over their hands earlier than over their speech organs, (2.) children can *see how* signs are produced with the hands, but it is impossible to see how words are produced by the speech organs and (3.) parents often sign on their child's body or shape the child's hands into the given sign for a better understanding of the shape and movement (Øhre.1987). Deaf children with late-signing parents acquire sign language perfectly, and their language

¹³ This is the ASL representation of the sign BIKE. Source: <http://www.lifeprint.com/asl101/pages-signs/b/bicycle.htm>. Last accessed 03.18. 2011.

¹⁴ This is the ASL representation of the sign CAR. Source: <http://www.lifeprint.com/asl101/pages-signs/c/car.htm> Last accessed 03.25. 2011.

development may serve as an argument of Chomsky's argument of poverty of stimulus (Pinker.1994).

Hearing children receiving only signed input will reach the same milestones at the same time as hearing children with spoken input or deaf children with signed input. Hearing children with both spoken and signed input will acquire both languages at the same time and with no preference for either (Petitto.2000).

3.2 Non-native signers

A huge majority (90%) of the world's deaf children is born into families with hearing parents (Goldin-Meadow & Mylander.1985, Schirmer.2000). Having a deaf child is a great challenge for the parents and they must early on choose what method they believe will benefit their child's language development. The most common path is for the parents to *not* learn sign language, but a manually created system¹⁵ combined with speech to communicate with their children. The main goal is to get the child to speak, with the help of hearing aids and extensive speech training.

For children with severe and profound hearing loss, hearing aids and speech training will do little good. Linguists have found that shouted conversation is impossible to hear for a child with a severe hearing loss (70-90 db) and for a child with a profound hearing loss (≥ 90 db); only occasional sounds can be heard. However, researchers do maintain that these sounds are vibrations rather than actual sounds. "Even with instruction, the children's acquisition of speech is markedly delayed when compared either to the signs of deaf children of deaf parents or to the speech of hearing children of hearing parents" (Goldin-Meadow & Mylander.1985.6).

¹⁵ I will come back to manually created systems in 3.2.2.

Frustrating for all hearing parents with a deaf child is the lack of a common form of communication. The important issue in my thesis is *when* deaf children with hearing parents actually gain fluency in any language and whether a critical period will stop them from ever being fluent in any language. Goldin-Meadow's research (2003) shows how resilient properties in language can develop in children who do not receive sufficient linguistic input. That is to say, they neither receive oral input, which would 'teach' them how to speak, nor manually created sign input to 'accompany' the spoken input. I come back to her findings in 3.2.1. By learning sign language and using it at home as soon as the hearing loss is discovered, hearing parents can offer their children the same language development and language acquisition as hearing children with hearing parents and deaf children with deaf parents. Research on *Swedish Sign Language* (Deuchar.1984) has shown that, if parents start to attend sign language classes before their children are one year of age, their children acquire sign language in the same typical manner as deaf children with deaf parents. However, children will often be superior to their parents in developing sign language and it is therefore important for children to spend time with native signers to receive appropriate input.

Children with profound and severe hearing loss gain next to nothing from hearing aids and speech training and will therefore lag behind in their language development. Parents who do not use signing in their communication with deaf children delay their children's acquisition, which could have developed naturally if the proper input (sign language) had been provided. Research by both Morford & Mayberry (2000) and Easterbrooks & Baker (2002) has shown that, in order for children to gain native fluency in ASL, exposure to the language must not occur later than at age six. There are significant differences in children signing from birth and those signing from age six. Deuchar (1984) found that certain inflectional rules of ASL are related to having signing parents and to have acquired ASL before age six. I return to the age issue in chapter 4 where I discuss bilingualism in deaf children. Deaf youths who begin to

sign only in adolescence face the same problems - as adults do when learning a foreign language, or hearing youths who experience delayed oral language acquisition (see Ratner.2009 for further discussion). Moreover, they will never achieve native competence in the signed language. Deaf children with hearing parents who receive no linguistic input, neither signed nor spoken, provide evidence that language is not a skill which develops automatically in children (Sacks.2009). These children have no reference of self and others. Understanding the principle of pronouns is a huge task. What are the referents of personal pronouns, who is/are *me, you, him, her, us* or *them*? Pronouns are often mistaken for proper names and cause confusion when used to refer to different entities. The linguistic concepts of time, such as *day, year, hour* or *minute* will have no meaning and the same goes for 'future'. Moreover, deaf children with no linguistic input will have been deprived of the concepts of the abstract and the imaginative (Sacks.2009).

3.2.1 Self-developed gesture systems

Through her years of research on ASL, Susan Goldin-Meadow has focused on the nature and development of the home signing systems of deaf children with hearing parents. It is important to notice that Goldin-Meadow's research has been conducted on children that have no spoken or signed linguistic input. They develop their signing systems merely from the *gestures* they see in conversations around them. Her statement in her research is:

“If there is a threshold level of linguistic input necessary for certain language properties to develop, these properties should *not* develop in a child who lacks linguistic input. If, however, linguistic input is not necessary for a set of language properties to develop, these properties ought to emerge in the communications of a child without input” (Goldin-Meadow.2003.47).

3.2.1.1 Pointing gestures

Deaf children's gesture systems differ greatly from the gestures of speaking children. Deaf children create a system and use the gestures consistently as soon as they have been mapped with a meaning. Their pointing gestures are used as nouns and pronouns, e.g. to refer to both present and non-present objects, places, and people; and their headshakes have the properties of the negations 'not' and 'can't'.

Deaf children use their pointing gestures to direct the interlocutor's gaze to an object. The point itself does not refer to *what* the object is, only *where* it is. This one point can therefore be assigned with several interpretations as deaf children can place many meanings in a single point. Deaf children use their pointing gestures to cover the same objects (inanimate objects, people and animals) that speaking children refer to with words.

3.2.1.2 Iconic gestures

In spoken conversations we sometimes use iconic gestures to display what has happened in a given situation or what is actually going on at the present moment in the conversation. Two of the iconic gestures deaf children pick up from conversations actually look a lot like two ASL signs: BREAK (as in something is broken) and GIVE. However, these are often not as iconic as the gestures could have been. The children use the sign/gesture BREAK, which looks like something is broken in half, for everything that is broken, not just in half. The sign/gesture GIVE, an extracted hand palm up, is used whether to indicate giving or receiving, and of objects that are both small enough to fit the palm, but also objects that would be too big. It is also important to note that these children have to create iconic gestures themselves to be understood by their surroundings and they seem to be much more conscious of iconicity than their deaf peers acquiring sign language from birth.

3.2.1.3 *Conversational gestures*

Modulating gestures represent a group of gestures that is borrowed from spoken conversational gestures. The three most common conversational gestures are: “nods, side-to-side headshakes, and one- or two-handed flips” (Goldin-Meadow.2003.79). In the following example, taken from Goldin-Meadow (2003.79) we see how one of the deaf children uses modulating gestures both to negate and to affirm something:

4. Lisa + [headshake] + CHEW – DAVID + [nod] – EAT – DAVID

The sentence means “Lisa is not going to eat lunch but I am” and we see how the headshake negates the first element of the sentence and how the nod affirms the second part. In spoken language(s), the third type of modulating gestures, flips, is usually used to express doubt and surprise. In addition to these meanings, deaf children use this gesture to question an object’s location (whether this is present or not) or to mark the remote future and past.

Deaf children have almost as many iconic gestures as pointing gestures, but fewer modulating gestures. Hearing children on the other hand, produce many pointing and modulating gestures, but not as many iconic gestures (Goldin-Meadow.2003).

The question that comes to mind is of course where the children get all these gestures from. It seems almost like an impossible explanation that they just pick it from conversations and develop a complete system themselves. Goldin-Meadow has studied how mothers use gestures in communication with their deaf children to see if there is a pattern. The answer is ‘no’. The mothers use iconic and pointing gestures in almost the same range as their children. However, they use about 20% of their children’s gesture vocabulary so that the children have 80% novel gestures that do not come from their mothers. The mothers seem to have fewer types of iconic gestures and they tend to use iconic gestures for verbs and adjectives rather than for nouns. Pointing and modulating gestures are used in a much more restricted way by mothers than by their deaf children. Mothers never refer to non-present objects with points

and as mentioned previously, deaf children have extended the meanings of modulating gestures to a considerable degree. Both Goldin-Meadow (2003) and Deuchar (1984) have concluded that mothers (and other caregivers) are not language models, but they are in fact learning the gesture systems from their own children.

The results of Goldin-Meadow's research provide us with invaluable information on how deaf children can create a "language" by themselves, which further supports the theory that speech production and speech perception do not control language development in children.

3.2.2 Manually created systems

From 1880 up to 1960s, the usage of signed languages was banned from schools all over the world, and the deaf population around the world suffered during 'the oral period'. Parents were discouraged to sign with their children because the children should learn speech. After 'the oral period', signed languages such as ASL were not reintroduced in schools, but manually created systems were developed to function together with English. There are several types of these systems, but they have certain aspects in common. Syntax and morphology follow the rules of English and in order to do so, inflectional signs have been invented. Most of the lexical words are signs from ASL and are supplemented to varying degrees by fingerspelling. So in order to sign 'playing' in Manually Coded English (MCE), one uses the ASL sign PLAY + the created inflection -ING (Berent.2004.316). Parents sometimes favor these manually created systems over ASL because they can sign to their children at the same time as they speak and it seems easier for parents to sign to a system which follows the syntax of their first language, in this case English. Linguists know that children exposed to created systems change the input into structures more similar to those of ASL than MCE or English (Goldin-Meadow.2003). We know that grammatical relations in ASL are spatial and the ones in MCE are sequential (as in spoken English). Children actually replace the sequential

relations with spatial ones similar to those we find in ASL. Further research (Sacks.2009) provides us with supporting evidence that *Signed English*¹⁶ might hinder children's ability to acquire the natural signed language. Deaf children must be allowed to change the input of manually created systems into more ASL looking forms in order to naturally acquire their first language. Parents and educationalists may not be aware of the important linguistic elements that are deleted from both ASL and English in the usage of MCE. By using MCE one deletes the intonation and rhythm. To compare, we can think of "watching a kind of written language performed in the air without any periods, commas, dashes, or semicolons, and without any clues about what is important" (Israelite.1992.33). According to Israelite, children who communicate only with MCE might be considered "half-lingual" because they learn neither ASL nor English. They learn to communicate with a made-up system and consequently they do not have a natural language.

3.3 Summary

The linguistic approaches provide us with a valid explanation of the language acquisition of natural languages. Because signed languages are natural languages, we expect the explanation to remain valid, which it does in fact. Native signers¹⁷ will reach the same milestones at the same time as hearing children who acquire spoken languages. Non-native signers, on the other hand, begin their language acquisition (or learning) after the age of six (in other words, when the critical period is over), and their sign language show permanent traces of delayed acquisition. 90% of all deaf children are born to hearing parents, and most parents choose not to learn sign language, but a sign system which consists of signs, but follows the grammatical rules of their first language. This makes it easier for them to speak and sign at the same time.

¹⁶*Signed English* is one variety of the manually created systems.

¹⁷Children who begin to sign between birth and the age of six.

However, as I wrote in 3.2.2, researchers question the usage of these sign systems, believing deaf children are linguistically restrained. One of the important questions in research on children with atypical language developments has been ‘what happens when children receive no linguistic input?’ Goldin-Meadow’s research, described in some detail in 3.2.1, provides us with invaluable information on home signing systems. These systems are developed by children with no spoken or signed input, and their caregivers are not language models, but learn the signing system from their own child. The goal of Goldin-Meadow’s research was to show which properties of language that are innate and can develop without input. This chapter is divided into two important parts: native signing children with a typical language acquisition and non-native signing children who have an atypical language development and delayed acquisition. As we shall see in chapter 4, language from birth will profit the deaf child immensely.

4 Bilingualism in deaf children

This chapter will describe how deaf children are bilingual and it is divided into two larger sections. The first section focuses on what bilingualism is, different types of bilingualism and how deaf children become bilingual. In this section I use ASL and English as examples of bilingualism, but this applies for all signed languages and majority verbal languages. In the second section I take a closer look at the educational systems in Norway and the USA. Norway has only one system of education for deaf children whereas the USA has several types of systems, and parents can choose whatever system they believe benefits their child. I have decided to look at the two educational systems separately by giving an introduction to what obstacles and difficulties deaf children may encounter in Norwegian and English and if there are any advantages in starting school with a developed sign language. Then I will provide a more detailed description of the school system(s) before I conclude each section with criticism and consequences of the system(s).

4.1 Bilingualism and deaf children

4.1.1 Bilingualism in general

No single definition explains bilingualism since it all depends on how we as individuals consider bilingualism. Many would argue that non-native English students at university level are bilingual because they master their own first language and English fluently. Or others would argue that only children who have simultaneously acquired two languages from birth are to be considered bilingual. Zahl¹⁸ (2004.164) presents five different definitions of who a bilingual might be:

“de er tospråklige som enten har lært seg to språk fra starten av i sin egen familie (1),
de som har lært seg to språk fullstendig (2), de som kan bruke to språk i de fleste

¹⁸ This book is in Norwegian and I have given an English translation following the Norwegian quote.

situasjoner (3), de som kan identifisere seg med to språk og to kulturer (4), og/eller de som kan identifiseres av andre som tospråklige (5).”

Translated to English: “bilinguals are someone who has acquired two languages from birth within their own family (1), someone who has fully learnt two languages (2), someone who can use two languages in most situations (3), someone who can identify with two languages and two cultures (4), and/or someone who are identified as bilingual by others (5)”.

There are also two important definitions of *how* one becomes bilingual. First, simultaneous bilingualism is what we might think of as the classical case of bilingualism – a child having a parallel acquisition of two languages resulting in two first languages. Second, sequential bilingualism is achieved if someone has fully acquired a first language and then learns a second.

4.1.2 Bilingualism in deaf children

Deaf children become bilingual one way or another because as a minority group they need to learn the majority language to function in society. Similar to other minority groups, deaf children do not have the opportunity to choose their second language – it is given that they learn the majority language (Zahl.2004). However, spoken-signed bilingualism is radically different from spoken-spoken bilingualism for two reasons. First, signed languages are visual-spatial languages whereas spoken languages are auditory-vocal languages. Secondly, the hearing status in deaf children determines how they will learn English, and deaf children are challenged when the hearing status is so bad that English cannot be perceived through speech, but only through English in its written form (Berent.2004). This often results in English being the child’s second language (L2) even though he or she was exposed to English as the first language (L1) or as the only language. Linguists have argued that, based on modality alone, deaf children’s first language (L1) will always be sign language irrespective of whether they

were exposed to sign language or English first. The reason for this lies in the restricted access deaf children have to English as a spoken language (Berent.2004). Because deaf children may be born with damages to the speech organs or never receive speech training, their abilities in the majority language are always measured in reading and writing, and not speech.

Berent's research on spoken language vs. signed language bilingualism can be presented as in the table below which I will explain in some detail. A number of factors affect the degree to which deaf children become bilinguals, and the different combinations of letters give us different possibilities of bilingualism. The left column provides us with the hearing status 'deaf' or 'hearing'. I will not comment on bilingual development in hearing children since my thesis is on deaf children. The mid column will tell us of the deaf child's ASL competence level, which can be L1, L2 early or L2 late. The right column will provide us with competence level in English. This is L1, L1.5 or L2. The term 'L1.5' is included by Berent, and denotes English learnt as L1, but with L2 qualities. A fully bilingual deaf child would have the combination ACF (ASL and English as first languages) and "be a native ASL signer who had internalized English language sufficiently early to possess native (-like) English competence" (Berent.2004.318). However, 90% of all deaf children are born to hearing parents and the most common combination of ASL vs. English bilingualism would be ADG (deaf, ASL early L2 and English as L1.5) and AEG (deaf, ASL late L2 and English as L1.5).

Table 1. Categories defining ASL-English bilinguals¹⁹

Hearing status	Language	
	ASL	English
A) Deaf	C) L1	F) L1
B) Hearing	D) L2: early	G) L 1.5
	E) L2: late	H) L2

From the research conducted on language preferences in deaf children it emerges that there is a close connection between hearing loss and language preference. Children who are hard of hearing will prefer speech over signs, whereas deaf children prefer sign language over speech. However, research results also indicate that the bilingual children switch between language codes depending on who they are interacting with: they use only sign language when communicating with deaf peers and teachers, and they use both sign and verbal language when communicating with hearing parents (Høie & Vonen.2004). Deaf children also code-switch between different types of sign languages. Surprisingly, Berent's research (2004) shows that native signers (who have acquired ASL from birth) switch more successfully from ASL-like to more English-like signing than non-native signers (who have learnt ASL after age six). Certain English words are blended into sign language either through borrowings which are turned into signs or fingerspelled. When a deaf person has become bilingual, he or she will use ASL and English in different situations. He or she will be more comfortable using ASL in close up communication situations, i.e. face-to-face conversations. English in its written form, on the other hand, will be preferred in non-face-to-face communication, i.e. e-mails over phone calls (Zahl.2004).

¹⁹ Taken from Berent.2004.319

4.2 Educational systems: in USA vs. Norway

Deafness is a shared handicap: ‘The deaf child is not like a blind person who is seen though he cannot see; the deaf person not only can’t hear, but is not heard’ (Julian de Ajuriaguerra in Bouvet.1990.86). A meeting between a hearing and a deaf person results in two “deaf” people because there is no common way of communicating. I believe that one of our greatest fears is to be without language. For centuries, the ultimate educational goal of the hearing/speaking majority has been to make deaf/signing minority *speak!* Deaf children could be fluent in sign language and reading/writing the majority language and have a more typical language development if the language were taught through the available channels. Instead, the educational systems have insisted on speech training, resulting in children lacking abilities in sign language, reading and writing the majority language.

For centuries, educationalists have disputed *how* deaf children should be educated. The first major decision was made during the teacher conference in Milan in 1880. As mentioned in 3.2.2, signing was banned and up until the 1960s, the teaching method was oral language only. When signing was allowed in teaching again it was not *American Sign Language* (ASL), but *Manually Coded English* (MCE), as discussed in 3.2.2. The main argument for this decision was that sign language (ASL) would interfere with the deaf children’s learning of English because of the different nature of the two languages. The reason behind this argument was that the deaf children who learnt a sign system “would develop English skills naturally and at a pace equivalent to that of hearing children learning English” (Berent.2004.315f). However, later research has shown that this theory is not tenable (see section 4.2.2.1 for discussion). The second argument which has also been discarded through research is that sign language is not related to the learning of English at all. The differences between the two languages will “constitute as a barrier rather than a bridge” (Hoffmeister.2000.146). Sign

language should therefore only be used exclusively in informal face-to-face conversational settings between two or more deaf persons. English would be the preferred language in informal conversations with hearing people, and more in formal settings. The one argument which has been accepted time and time again in research papers is that sign language *is indeed* related to the learning of English. Linguists have shown that deaf children who start school with well-developed sign language abilities outperform late signers significantly on most language tests (Hoffmeister.2000). With a well-developed language, the ability to remember printed text is much better so that deaf children who already master sign language will be better prepared to learn to read English.

Children's rights are clearly stated in both the *Universal Declaration of Human Rights* (1948) and the *Convention of the Rights of the Child* (1989). It is further stated that elementary education is to be obligatory and free of charge and that no child is to be discriminated. Accordingly, many countries have chosen an integrative educational strategy and promote the mainstreaming of deaf children in their local schools (but see section 4.2.1 for criticism). Some countries, however, have chosen to maintain the system of residential and/or daytime-schools for deaf children only, or bilingual/bicultural education (see 4.2.2).

4.2.1 Deaf education in Norway

4.2.1.1 Language obstacles

Already in kindergarten, deaf children struggle with the majority language: they show strikingly lacking abilities when it comes to language understanding, the interaction with peers and adults, and linguistic awareness. This is particularly evident in overextensions, their lack of interest in writing, the lack of color terms and the telling/understanding of jokes, riddles and puzzles (Wagner et.al.2008).

Several researches (Hjulstad & Kristoffersen .2004, Wagner et.al.2008) have looked into the interaction between deaf children and hearing peers in kindergarten and unanimously concluded that in a kindergarten with several deaf children, deaf children will interact with both deaf and hearing peers. Deaf children show initiative and turn-taking in both playing games and dialogues. The same occurs in interaction with educators. Deaf children show initiative to start dialogues, and can continue talking about the same topic, or successfully switch to a different topic. In kindergartens where there are only one or two deaf children, on the other hand, social interaction takes place in a totally different manner. These children do not participate in dialogues or playing games with hearing peers and will usually only relate to one educator. In dialogues with the educator, the child will show very little initiative and violate the rules of turn-taking. The dialogue is often characterized by the educator asking questions and the child answering in short utterances (often only one or two words).

Whenever an educator attempts to arrange a game between the deaf child and hearing peers, the deaf child will not participate in a typical way. The deaf child will rely heavily on the educator for language and will be more of an observer than playing *with* his or her peers.

Researchers unanimously agree that deaf children who come to school with a well-developed sign language achieve better results, not only in language courses, but also in other courses in school. There is also a link between the children's knowledge of sign language and their reading and writing abilities (Hjulstad & Kristoffersen.2004). When comparing children in residential schools with mainstreaming children, linguists see clear differences in their language. Deaf children in residential schools are surrounded by their first language all the time and have therefore developed better linguistic abilities than their peers who are mainstreamed in local schools.

When deaf children have attended school for some time, there are certain aspects of the Norwegian language they seem to struggle with more than others. These are complex

constructions in Norwegian, in particular sentences with passives, clefting, and relative clauses with 'som' ('that') as the subject. These constructions cause great difficulties and misunderstandings for deaf children (Wagner et.al.2008). In addition, children with severe or profound hearing loss also struggle with inflections for tense and mood in verbs, and definiteness and number inflections for nouns. So there is a clear relation between severity of hearing loss and linguistic abilities.

4.2.1.2 'Mainstreaming' and change in the curriculum for deaf children

Kunnskapsdepartementet (Ministry of Education and Research) is responsible for the education of all children in Norway. In 1997, the Norwegian government passed a bill of bilingual education with the result that *all* Norwegian children were to receive their education in their first language, and that they were to receive their education in their local schools. As a consequence of the bill, all the residential schools for deaf children were closed and children were mainstreamed in their local schools (Wagner.et.al.2008). Later, in 2006, the government adapted this resolution of bilingual education to be valid only for deaf children and the native Sami population in the north of Norway whose official language is Samisk. Special curricula were developed to ensure bilingual education for both these groups and thus to ensure their bilingualism. Deaf children follow the same curriculum as hearing children in all subjects except Norwegian Sign Language, Norwegian, English and drama/rhythmic education. The goal is to make all deaf children functionally bilingual in Norwegian Sign Language and Norwegian (Wagner.et.al.2008). Functional bilingualism can be defined as:

“Tospråkighet refererer til et menneskelig fenomen hvor individets språklige repertoar omfatter to språk med hvert sitt system, dvs. med hver sine semantiske,

syntaktiske, leksikalske og fonetiske karakteristiske trekk, og som kan tas i bruk av innehaveren i det omfang og den tid som trengs” (Øzerk in Zahl, 2004.163)²⁰

Translated into English: “Bilingualism refers to a human phenomenon where the individual’s linguistic repertoire includes two languages with separate systems, i.e. separate semantic, syntactic, lexical and phonetic characteristics, and can be put to use in *whatever extent and time needed* [my italics] by the individual”.

In addition to Norwegian Sign Language and Norwegian, deaf children, from their very first year in elementary school, will also be learning English and one variety of sign language from an English speaking country (British or American Sign Language).

4.2.1.3 Criticism and consequences of the system

The mainstreaming system in Norway has been criticized time and time again for not fully benefitting the deaf children’s needs. Researchers found that most of the local schools do not have the knowledge, the abilities or the economy to properly and adequately educate deaf children. The situation today is that teaching is shared between the local school, municipal schools/classes for the deaf and the closest Kompetansesenter (centre of expertise). All subjects, except Norwegian Sign Language, are taught at the local school, while the pupil attend regular sign language classes at the municipal school and go to the centre of expertise for seminars on sign language and learning of the deaf culture (often for intervals of two weeks at a time). If the local school has the resources needed to arrange the sign language classes itself, the school is still imposed to cooperate with the centre of expertise. In other words, there are three different public entities involved in a single pupil’s education.

Deaf children have difficulties in class room teaching in their local schools. When compared to children in residential schools, children who are mainstreamed experience far more misunderstandings in typical classroom situations. The teacher is usually not aware of this

²⁰This book is in Norwegian and I have given an English translation following the Norwegian quote.

happening because one-to-one conversations between teacher and pupils are usually not a problem, and the teachers tend to forget that in a classroom with at least ten more pupils the communication situation changes drastically for the deaf pupil. Equally, deaf pupils may feel left out in mainstreaming classrooms: during an individual work session, hearing children talk to each other while solving tasks. While solving his or her tasks alone, the deaf child finds him- or herself only in conversation with the teacher, and not being able to follow the spoken conversation between the hearing peers. Frequently, in a situation like this, there are two levels of communication in the classroom and the deaf pupil only has access to one of them. Deaf children may feel cut off from some of the social interaction in the classroom even though this is not intended (Ohna.2004).

As was stated in the both *The Universal Declaration of Human Rights* and *Convention of the Rights of the Child*, every human being is entitled to education free of discrimination.

Simonsen (2004) raises the interesting question of who is everybody in the term 'everybody'. By including all children in the local schools with mainstreaming we experience a double standing of morality. Deaf children still feel discriminated because everybody is not 'everybody'.

4.2.2 Deaf education in the USA

4.2.2.1 Language obstacles

In the USA, like in Norway, deaf children come to school with different degrees of language proficiency. In extreme cases, children start school with no knowledge of any language, signed or spoken, and will therefore begin to learn two languages as second languages. In addition, they will need to learn how to read and write in English. The latter is perhaps the greatest obstacle because the children have no established first language to use as a reference

system for English as their second language, and consequently learning how to read and write while actually learning English (Chamberlain & Mayberry.2000).

Because deaf children often suffer from ‘information deprivation’ (Sacks.2009.25), they miss out on ‘incidental’ information hearing children are exposed to everyday through TV, radio, overhearing conversations etc. When arguing that ‘information deprivation’ causes lacking abilities in English, Sacks (2009) identified several elements in the English language which are difficult for deaf children, such as forming questions, overuse of simple sentences and lack of vocabulary. Sacks also criticizes the mainstreaming education to be so focused on speech training – that deaf children fail to acquire general knowledge which they could have acquired through ASL. Sacks conjectures that deaf children’s reading abilities in English could have been better if there had been less focus on speech training and more on reading. Deaf children struggle particularly with question formations. In ASL, questions are formed by incomplete sentences, e.g. “In your house you, your mother ...?” (Sacks.2009.46), and not the English formation “Who lives in your house?” (Sacks.2009.45) In addition, deaf pupils have difficulties comprehending violations of S-V-O structures (such as passives and embedded clauses), modals, verb auxiliaries, infinitives and gerunds, as illustrated in the following examples from Ratner (2009.321)²¹:

1. “ I really like {} college.
2. The reason that is good for me.
3. Also they have many students that I know.
4. That school is good for me and keep my mind up and keep busy.
5. they have good education in {}.”

Sentence (1.) is a regular simple sentence, which is typical for the deaf pupil. In sentence (2.) however, we see a violation in the formation of a ‘that’-clause. The pupil has here omitted ‘it’

²¹ This is taken from Ratner.2009.321 and originally not divided into separate sentences, but I have chosen to do so in order to more easily explain the grammatical mistakes.

from 'that it is' and the sentence becomes ungrammatical. Sentence (3.) is grammatically correct, but I would probably say 'They *also* have many that I know', and not 'also' in the initial position in the sentence. In sentence (4.) there is another incorrect 'that'-clause, and repetitive style of simple sentences connected by the conjunction 'and'. In addition we see a concord mistake in 'keep' which should have been 'keeps'. Sentence (5.) is incorrect with the lowercase 't' in 'they'. Speech training and extensive syntactic training leave traces in deaf children's language by overuse of simple sentences which result in a repetitive style, which we saw in sentence 1 and partly sentence 4 above.

Linguists (Padden & Ramsey.2000) have found connections between ASL knowledge and reading abilities in English. Those children who perform well in reading are competent in associative skills, to associate words with letters. Deaf children with good associative skills have better abilities at writing down fingerspelled words or translate initialized signs²².

However, reading abilities for deaf children in general is strikingly poor. Hoffmeister (2000) reports that only 3-5 % of the deaf population perform equal to their hearing peers when it comes to reading. Ratner (2009) reaches the same conclusion: the average deaf high school graduate has the same reading ability as a third-grade hearing child.

Deaf children with deaf parents are in a unique situation because they have a developed first language, ASL, before they start school. However, we know that only 5-10% of all deaf children are born to deaf parents (DCDP) so they constitute a minority group (Berent.2004). Israelite's research (1992) showed that DCDP, already at the age of four, can isolate handshapes in fingerspelling and signing, and relate them to letters in print. The same research showed that the children had better memory and recognition of fingerspelled items that are orthographically permissible in the English language than those that are not. Israelite

²² Initialized signs are often borrowed words or concepts from English which have no counterparts in ASL. The sign will consist of one letter, the first letter of the English translation. The initialized sign of 'volcano' would therefore be represented by the sign 'V' and in text represented as VOLCANO (Padden & Ramsey.2000.173). Fingerspelling and initializing signs are common methods used to improve deaf children's spelling abilities.

(1992) has also looked at the results from the Scholastic Assessment Test (SAT) from both deaf children of deaf parents (DCDP) and deaf children of hearing parents (DCHP), and found striking differences between the groups. DCDPs reading abilities were 2.1 years ahead of DCHPs, and for arithmetic it was 1.3 years. The overall grade scores show that DCDPs perform 1.3 years ahead of DCHPs. This indicates that coming to school with a well-developed language is indeed an advantage and remains so throughout the years in school.

4.2.2.2 The existing educational systems in the USA and what they represent

In the USA, there are several different systems of education, and it is up to parents to decide which system would benefit their child.

The most striking difference between the American and Norwegian system is that the USA has kept residential schools. Children stay at school where they are surrounded by signers all the time. Linguists have looked at how residential schooling may affect deaf children's language and the results are positive. The pupils are surrounded by peers and teachers competent in their primary language and their knowledge of ASL help them develop their skills in English. Like for any other school system, economy is the vital factor for residential schools, and the school fees may secure children an education at a school with native signing and high expertise. However, at residential schools with less financial means the teachers will not have the same amount of expertise and education.

American deaf children can be mainstreamed in their local schools like their Norwegian peers. Contrary to the Norwegian system, there are no sign language classes outside the local school and no center of expertise. ASL is to be taught in school, but due to inadequate signing teachers, a manually created system is most often used.

Bilingual/bicultural education (bi-bi) is an educational program which focuses on knowledge of ASL and English, and the minority (deaf) culture and the majority (hearing) culture.

Guidelines for bilingual/bicultural education are given in The Commission on Education of the Deaf:

“Bilingual/bicultural instruction includes: academic “subject matters” taught transitionally, at least in the pupil’s primary language; English as a Second Language (ESL); the history, culture, and language arts of the pupil’s minority-language group; and American culture and history. The goal is to teach the pupil English so that he or she can ultimately be educated exclusively in English without falling behind in other studies. This objective is met by fostering a healthy self-image, developing cognitive powers, creating a bridge to the child’s existing linguistic and cultural knowledge, and developing reading and expressive skills in English” (Quoted from Israelite.1992.53).

From kindergarten and throughout high school, bi-bi programs are offered, and even though the goal is to be proficient enough in English to obtain college/university degrees in any college/university, there are bi-bi programs at this high level of education as well (Israelite.1992). The educational institution itself is responsible for how the program is put together, but the fundamental idea is that ASL is the first language and the preferred language of communication. Children develop their abilities in ASL before they start to learn English. ASL is used to teach English, and important parallels between the two languages are learned. Equally important to language is the understanding of cultures. Deaf children of deaf parents will take part in the deaf culture and have much social interaction with other deaf peers and adults. On the other hand, they might have no sense of belonging to the hearing American culture. Deaf children of hearing parents, the vast majority of deaf children, will feel between a rock and a hard place – feeling deaf and English, but not entirely a member of any of the cultures. In a bi-bi program they will learn important values and historical events of both cultures. Hearing parents are encouraged to become part of the deaf culture together with their

children. Some institutions even teach children a manually created sign system, which enables deaf children to sign with people who only know a manually created system and not ASL.

4.2.2.3 Criticism and consequences of the systems

When deaf children started to mainstream in their local schools, the residential schools were heavily criticized. They were looked upon as old-fashioned and a contributor of barriers between minority and majority. However, being at a school where sign language is the primary language, and easily developing language should be considered valuable. The level of competence of the residential schools in the USA should be raised and native signers, with their expertise, should teach children their primary language.

I am critical to the mainstreaming system in the USA because it has been shown repeatedly that ASL is far too often replaced by a created sign system so that teachers can speak and sign at the same time in classrooms. In addition, far too many spoken words are deleted in signing and deaf pupils therefore miss out on a lot of information in the classroom. Due to economy, many teachers are not competent enough in ASL to teach it properly and deaf pupils often experience misarticulated signs, which may have completely different meanings, in addition to deleted signs. There is also no pattern as to which signs are deleted and classroom sentences are often incomprehensible, incomplete and subject to many misunderstandings (Israelite.1992).

The future for education of deaf children lies in bilingual/bicultural programs. Not only do deaf children become competent in at least two languages, but they also learn about both the minority and the majority culture they belong to. Research has shown that knowledge of ASL is positive when learning English, but I do not think children are capable of learning ASL and English (speaking, writing and reading) at the same time. A deaf child with no established first language will have great difficulties learning sign language and English (to learn about

language, read, write and receive speech training). Bi-bi education ensures sufficient knowledge of ASL before English is taught, and this is an educational system a child can join already in kindergarten. As Easterbrooks & Baker (2002) have argued – “knowledge of a first language facilitates learning of a second language. [...] A fully developed first language serves as a bridge to literacy in the second language” (Easterbrooks & Baker.2002.62).

4.3 Summary

Deaf children have to become bilingual because they are part of a minority group and need to function in the majority group. They therefore have no choice when learning a second language, it will be that of the majority group. As we know from chapter 1, children have the ability to acquire all natural languages, included signed languages, and before the critical period is over (by the age of six) children can acquire several languages. Native signers will be fluent in sign language when they start school, and their knowledge of sign language will be helpful when they start learning English. However, as we know, the vast majority of deaf children has hearing parents and is not native signers. Many will experience an atypical language development and a delayed language acquisition. In many cases, children will come to school with no language at all, and will have to learn the signed language and the majority language (reading, writing and speech training) all at once. With the correct input on the other hand, deaf children can be fluent in sign language when they start school and their education could be less trying.

Norway and the USA have different school systems, and the mainstreaming of deaf children seemed like a good idea when it was first introduced. However, the school systems have not managed to cope with the complications they were faced with. One cannot simply put deaf children in a hearing class with a teacher who does not even know sign language, but a sign *system*. Deaf children must learn their primary language and be allowed to appreciate it. Only

one of the educational systems I wrote about in the sections above seem to benefit the deaf child fully: bilingual/bicultural education. This is the one system where the deaf child is given the opportunity to value both their linguistic and cultural worlds. Deaf children need to be fluent in at least one language, and that should be sign language which is their primary language. Their competence in sign language should be ensured before English is introduced as a second language and deaf children will have sign language to refer to. However, it is more important for deaf children to find their identity. They are a part of both the minority and the majority group, and should learn about the history of both cultures. In addition, in bilingual/bicultural education, children have the opportunity to attend the program from kindergarten and all the way through high school, and in some cases even at university/college.

5 Conclusion

One of the aims of my thesis was to show how signed languages are natural languages and therefore are acquired in the same manner as any spoken/verbal language. In chapter 2, I presented my theoretical background and gave an account of the typical acquisition of a spoken language. I followed linguistic approaches in assuming that language is innate. By acquiring universal principles, children are capable of acquiring any of the world's natural languages. From the principles, children set parameters for language specific properties, and by having a Language Acquisition Device (LAD), presumably a physiological part of the brain, children acquire their mother tongue. The perhaps strongest argument for innateness is that no children are *taught* grammar, and even with incorrect and incomplete input, they still arrive at correct grammatical rules. Moreover, it is crucial that children have the ability to acquire any language, but only within a limited time span. Between birth and the age of six, children acquire language rapidly and effortlessly. After the age of six, language acquisition becomes harder and often the language will have permanent traces of a delayed acquisition. Since the linguistic approaches provide us with an explanation of the acquisition of all natural languages, this explanation should be valid for the acquisition of signed languages as well. In chapter 3.1, I gave an account of typical language acquisition illustrating that native signers reach the same milestones as their hearing peers acquiring spoken language at the same time. In addition, research (Petitto.2000) showed that hearing children acquiring both a spoken and a signed language, reached the same milestones at the same time and showed no preference for either language. However, in 3.2, I showed how non-native signers have an atypical language development and delayed language acquisition. Non-native signers are deaf children with hearing parents who do not receive signed input before they start school. In other words, they start their sign language acquisition after the critical period. Several researches have unanimously concluded that, in order for children to gain native competence in American

Sign Language (ASL), the exposure should begin no later than age six. In 3.2.2, the focus was on children who receive no spoken or signed input at all. Goldin-Meadow's research provides knowledge of what properties of language that can develop without input by looking at deaf children's home-signing systems. The conclusions were that children can develop some language properties, but these are often only recognizable for caregivers who surround the child. Many caregivers learn a created sign *system* instead of a sign *language*. Grammatically, a sign system will be like their spoken language, but the signs will be from a sign language. Sign systems make it easier for caregivers to sign as they speak, but deaf children seem to change the input they receive and change it into more sign language-like constructions. Two of my research questions are answered in chapter 4. First, I wanted to show that deaf children have to be bilingual because they are part of a minority group, and have to be able to function in the majority group. However, signed-spoken bilingualism differs from spoken-spoken bilingualism, and deaf children have limited access to the majority language. Depending on their background, their linguistic abilities and linguistic development, deaf children develop skills in the signed and spoken language at different rates. Importantly, deaf children's skills in the majority spoken language are always measured in reading and writing, not speech. My second aim was to give a description of the educational systems of Norway and the USA, and to comment on which system that actually benefits the deaf child best. In conclusion of chapter 4, I argued that the American bilingual/bicultural programs are best suited to educate deaf children. Children acquire competence in sign language, their primary language. More importantly, they learn about the two cultures which they are a part of. In addition, to have the opportunity to be part of this program from kindergarten to university/college creates the stability needed in an educational program. One cannot simply mainstream deaf children in their local schools if these schools do not have the professional or financial competence to ensure children a good education.

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