

Abstraction in language acquisition

Competence or Performance?

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August 2006

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Chapter 0 Introduction

When studying human language the question rises what kind of knowledge the speakers of a language apply when they are speaking and understanding language. Language seems to be a highly creative function of the human mind because it seems to consist of an infinite number of expressions that may consist of many different levels of abstraction and structure.

However, it seems that, after approximately twelve years of experience, most speakers of a language will be able to understand most of these infinitely many sentences that can be expressed in this language. Still, the question rises if it takes so long to acquire a language, what exactly is so particularly difficult about it? Many theories of grammar have made an attempt to answer this question, but it is proven to be very difficult to answer it. The difficulty lies mainly in the fact that it is unclear what kind of knowledge is used in the processing of language, and as a consequence, there is not much consensus among linguists what it is exactly that is learnt during the acquisition of language. There are theories that assume that the acquisition of language is a matter of storing instances, often called exemplars, of this language. This exemplar storing implies that after hearing certain constructions, they are stored and can thus be produced. However there are also theories that claim the opposite: no instances are stored, but an abstract representation: a rule. There thus seem to be two options: the units of processing in the human linguistic competence are abstractions or they are exemplars.

The debate on exemplar versus abstraction based learning is very fascinating, especially because it seems to touch on the fundamentals of linguistic theory: how is language represented in the human brain and what does the language competence look like? The question becomes even more fascinating when it is realised that this question is not only related to linguistics, but to many disciplines of scientific research. For example, it seems that also in cognitive psychology an ongoing debate takes place on whether conceptual knowledge is dominated by abstract rules or instance-specific knowledge. Furthermore, this debate may even be seen as a more universal discussion in all scientific fields that deal with human behaviour, such as the fields of economics or history. It is conceivable that also there it is a central philosophical question if the observations that are encountered in these fields are dominated by deterministic rules or if every event is just another instance of an (economic) incident or a (historical) episode. It seems plausible a solution to say that, for example in history, independent incidents may have been under influence of a motive and thus form a subsystem,

but that there is not a self-contained system in which every instance is a consequence of an all-embracing rule system that is the driving force behind every event. However, in linguistics such a solution is not often suggested, instead there are mainly theories that put forward an explanation that contains either abstract or exemplar knowledge and the combination of the two seems a controversial solution that is regarded as 'cheating'.

In the present study it will be investigated what role there is for generalizations and for instance specific knowledge in the processing and especially the acquisition of language. In order to research this, a number of theories will be described extensively regarding their views on exemplar and abstraction based processing along with the evidence that they found for their assumptions.

The following four theories will be described: Generative Grammar (GG, Chomsky 1957), Exemplar Theory (ET, Johnson 1997) /Data Oriented Parsing (DOP, Scha 1990), Second Language Linguistic Processing (L2LP, Escudero 2005) and Second Language and Universal Grammar (L2UG, White 1989). These theories will be described and compared especially with regard to their views on exemplar and abstraction based processing and the acquisition of first language (L1) and second language (L2).

The four theories are taken from the fields of phonetics and syntax. Even though these two disciplines of linguistics may seem very distinct at first, it can be argued that there is a close relation between the two, mainly because they both describe language. Furthermore, in the book 'The Origins of Complex Language' (Carstairs-McCarthy 1999) it is argued that the complexity of syntactic structures in human language have evolved from phonetic strings. Carstairs-McCarthy (1999: 1 and on) argues that the relation between Onset, Nucleus and Coda closely resembles the structure of Subject, Verb and Object and he argues that the latter have evolved from the first. More recently, an entire edition of *Lingua* (volume 116, issue 5) was devoted to the similarities between the fields of phonetics and syntax. In the current study however, the main motive behind looking at theories from two different fields of linguistics is the ambition that a model that describes linguistic processing and acquisition should ideally be able to account for both phonetics as well as syntax.

Table 1 schematically provides the views on abstraction and exemplar based processing in first and second language acquisition, that are assumed by the different theories that are described in this study.

Table 1. Described theories.

<p>1. GENERATIVE GRAMMAR (Chomsky 1957) L1 learning: abstraction based L2 learning: general learning mechanism, (possibly exemplar)</p>	<p>3. SECOND LANGUAGE LINGUISTIC PROCESSING (Escudero 2005) L1 learning: exemplar/abstraction based L2 learning: exemplar/abstraction based</p>
<p>2. EXEMPLAR THEORY (Johnson 1997) L1 learning: exemplar based L2 learning: exemplar based</p>	<p>4. SECOND LANGUAGE AND UNIVERSAL GRAMMAR (White 2003) L1 learning: abstraction based L2 learning: abstraction based</p>

Traditional Chomskyan theory, which will be described in Chapter 1, states that highly abstract syntactic rules are the main component of the human linguistic competence and are innate to the human brain in the form of a universal grammar. What Chomsky proposes is that every language consists of a set of syntactic rules that can generate every grammatical sentence of that language. And as Chomsky assumes these rules to be innate to the human brain, the acquisition of a language is thus merely the activation of some of these rules along with storing of the words of the language that it learnt. However, this capacity to activate syntactic rules is dependent on childhood. After puberty, Chomsky assumes that it is impossible to acquire a language in the same manner as when a young infant. For the process of second language acquisition, Chomsky assumes that a more general learning mechanism is needed, or a talent, that a person may have or lack.

There seems to be a lot of evidence that suggests that this view is not entirely faithful to the seemingly richness of the language competence.

In the first place, it seems to be rather difficult to find evidence for rule based processing, because most phenomena can be explained both by rule based and exemplar based processing because regularity in language production may be caused by generalizations as well as online comparison of exemplars. Moreover, even though there are numerous attempts to find evidence for a difference in processing for regular (rule based) and irregular (storage based) forms of derivational morphology, it seems that there is not a significant difference in reaction time in a priming test for these two language forms¹.

¹ For example in Clahsen, Sonnenstuhl & Blevins 2002

In the second place, it seems that there is a lot of evidence for instance-specific, or exemplar, knowledge of language. People seem to have very specific knowledge about different speakers, ranging from knowledge about their voices and knowledge about who said what and when and even seem to have certain ideas of the different styles of different speakers, in that they seem to know what is typical for someone to say. This suggests that next to abstract knowledge, if there is any, there is also exemplar knowledge.

In the third place, it appears that in high schools, many children are trying to get hold of the grammatical rules of their languages when they are learning to dissect sentences of their language. However, even though all of the students are native speakers of the language that they are learning to dissect, there is not many of them that find this job particularly easy. Dissecting is actually seen as one of the more difficult subjects that is taught in high school. Does this suggest that there is no mental representation, or equivalent, for grammatical rules? Theories such as Exemplar Theory (ET) and Data-Oriented Parsing (DOP), to which Chapter 2 is devoted, state that every act that is related to linguistic processing can be explained theoretically without making use of grammatical rules. These theories state that there is no storage of abstract knowledge, but only online analysis of concrete language data. ET, is a model of phonetic processing and acquisition, and DOP is a theory of syntactic processing and acquisition, however both of them seem to base their model on similar assumptions and observations. ET and DOP assume that every language user has gathered his linguistic expertise through experience. They assume there is no inborn linguistic knowledge and that language is learnable by the storing of exemplars. Humans are thus regarded as walking databases of all the linguistic utterances that they have heard and produced in their lives.

However there is one problem to such an approach, in that it seems that, as was already suggested by Chomsky, humans do have at least some abstract knowledge of their language. Even though it may be the case that language processing and acquisition can be accounted for without reference to any abstract knowledge, this explanation also seems to deprive the language competence of its richness, because it seems that there actually are categories and rules represented in the human mind. For example, it appears that most speakers of a language are able to say that the sentence “John Mary Kiss” is not a grammatical sentence of English. Even though nobody ever explained this to them explicitly, speakers of a English seem to be able to judge that a sentence should have the Subject first, the Verb second and the Object last. This sort of observation suggests that there must also be some abstract knowledge that goes beyond unlikeliness or ‘never-heard-before’-ness.

In Chapter 3 the L2LP model (Escudero 2005) is described, which is a model of phonetic processing and acquisition, which proposes a combination of abstract and exemplar knowledge as relevant for language learning. The L2LP model suggests that exemplar storing can actually be seen as a means to acquire abstractions and it is assumed that exemplars are stored until enough information is gathered in order to represent categories by abstractions. In this model, there is thus a combination of exemplar storing and abstraction based processing. Also in the adult linguistic mechanism it is expected by the L2LP model that new data is compared to stored exemplars as well as abstract information in order to make the correct interpretation.

Chapter 4 will describe the L2UG model (White 1989), which rejects Chomsky's critical period hypothesis. White expects that the inborn language principles that are activated in childhood when the first language is learnt, are still available for second language learning. White thus assumes that the whole language learning, L1 as well as L2 is completely dominated by abstraction based processing.

In Chapter 5, the findings the different theories will critically compared and discussed. The evidence and the arguments that the different theories put forward will also be compared to what kind of evidence and arguments are used in cognitive psychology in favour and against abstract and exemplar based processing. The outcome of this discussion will result in a proposal, which will be tested in a grammaticality judgment experiment in which an example of reanalysis in Dutch will be investigated. This experiment is described in Chapter 6.

Chapter 1.

Generative Grammar (Chomsky 1957, 1965)

1.0 Introduction

Noam Chomsky is often said to be the founder of modern linguistics. With the writing of his famous work ‘Syntactic Structures’ in 1957 he gave birth to an important paradigm change. Instead of regarding spoken language as the main focus of inquiry for linguistics, Chomsky proposed studying the abstract system underlying this spoken language.

In the following chapter it will be discussed how exactly this is seen by Chomsky and what consequences his line of reasoning has for the acquisition and the processing of language.

The general objective of this study is investigating what exactly is the role of grammatical abstractions in the acquisition of language. Chomsky’s radical view that syntactic rules are actually the only means of linguistic processing might give interesting insight in the matter.

1.1 Grammatical rules

On the first page of his famous book “Syntactic structures” (1957 :11), Chomsky makes a statement that seems very relevant for the present discussion:

“Syntactic investigation of a language has as its goal the construction of a grammar that can be viewed as a device of some sort for producing the sentences of the language under analysis.”

This quote implies that language is a device that produces sentences. This entails one of Chomsky’s most influential ideas, namely that there is an underlying grammar that describes spoken language. In Syntactic Structures Chomsky firstly states this idea that it should not be spoken language that is described by linguists, but the underlying representation of this spoken language.

Chomsky has a strong opinion on what this underlying representation should look like. When describing the system, in the first place such a grammar is language specific. A grammar that describes and produces the sentences of one language, is called a Generative Grammar, and Chomsky’s method of investigation is named after this term.

However, the ideal outcome of such investigation is a collection of syntactic rules which is described in such abstract way that there is no reference to a specific language (Chomsky

1957:11). Such a grammar would describe the grammatical knowledge that believed to be innate to the human species, the Universal Grammar.

However, Chomsky goes further than stating that a Universal Grammar should describe the structure of every language of the world. According to Chomsky a grammar should ideally also account for the selection of a certain language, given a corpus of sentences from this language. In other words, a grammar should help a language learning child recognizing and selecting the language that is spoken around him.

The model that Chomsky proposes entails many hypotheses that are formulated by the theory of Generative Grammar (GG). Firstly that there is an underlying representation to spoken language, and that language should thus be described independently of language use; this hypothesis is known as AUTOKNOW (Newmeyer, 1998:23). Secondly, the hypothesis that there is a language faculty that contains the Universal Grammar (UG) module, that assists in the acquisition of language and describes the structures of all the language in the world. Chomsky hypothesizes that this Language Faculty (LF) is independent of other human capacities, this hypothesis is referred to as AUTOGRAM. AUTOGRAM is assumed to be a species specific faculty of the human brain, because it seems that humans learn language under the same condition that apes, birds and rocks do not (Chomsky, 1971: 123). Further in this chapter we will see that there is a third autonomy hypothesis in the GG paradigm, namely AUTOSYN, which formulates that syntactic rules are independent of semantic and frequency. These three hypotheses will be discussed in this chapter.

Evidence that is brought forward by GG for the psychological reality of abstract syntactic rules in language processing, is for example found in the acquisition of language. Chomsky claims that the acquisition of language is merely a matter of acquiring syntactic rules. Evidence for this claim is for example shown in a ‘mistake’ that many, if not all, children seem to make, such as (1).

(1) I goed.

When a child produces such a sentence, it shows two important claims of Chomsky about the syntactic nature of language acquisition.

On the one hand it shows that the acquisition of language is not a matter of imitation. (Chomsky 1965: look up) It is highly unlikely that a child imitates one of his parents when saying 'I goed'. Parents do use a child directed way of speaking to their children, which Chomsky refers as 'Motherese'. It is, however, not expected that parents use ungrammatical forms in this type of language.

On the other hand the child in the above example shows that it acquired the highly abstract grammatical rule of English that the past is formed by adding -ed to the stem of a verb. It is important to note that, logically seen, this utterance is not ungrammatical. In constructions like these, the regular past is applied to an irregular verb. It implies that the infant has acquired a highly abstract rule that is independent of meaning, stating that the past is formed by adding -ed to the stem of a verb.

Chomsky states that the main focus of inquiry for linguistics must be these abstract rules (Chomsky, 1957: 7 and on). As was mentioned above, abstract grammatical rules must form a Generative Grammar, which describes the linguistic competence of an adult speaker of this language and the studying of Generative Grammars will lead to the discovery of the Universal Grammar, which is believed to be innate to the human brain.

1.1.1 AUTOSYN

According to Chomsky, the set of grammatical rules is autonomous of semantics and frequency (AUTOSYN) and is, along with the lexicon, the main device that is needed to be a speaker of a language. In the following section it is discussed what arguments exist for the autonomy of syntax, as Chomsky (1957: 58-59) proposes.

In the first place, the independence of syntax follows from the fact that syntactic rules can actually be described without referring to semantics. Chomsky's attempts to describe syntax without reference to semantics can be studied in *Syntactic Structures*. In the second place, when observing grammaticality judgments, the independence of syntax from semantics is suggested by the fact that a sentence can be grammatical independent of its meaning. Every speaker of English will be able to tell that Chomsky's famous sentence (1) is grammatical, whereas sentence (2) is not, even though both sentences evidently have no meaning (Chomsky 1957: 59).

- (1) Colorless green ideas sleep furiously
- (2) Furiously sleep ideas green colorless

The independence of syntax from statistics is shown by the fact that the human linguistic competence seems to understand frequent sequences as well as infrequent sequences; frequency thus seems to have no influence on the understanding of an utterance. Every language user seems to be able to understand sentences that may have never been uttered before. This is regarded by Chomsky as evidence for the autonomy of syntax (Chomsky 1957: 59).

Croft (as cited in Newmeyer 1998: 28) defines three positions that follow from the AUTOSYN assumption.

- (1) At least some elements of syntax are arbitrary
- (2) The arbitrary elements participate in a system
- (3) That system is self-contained

Although these three positions are necessary to adopt the AUTOSYN assumption and are widely accepted within the field of GG, they also show some problematic parts of the theory of GG. These problems are all related to linguistic change.

Firstly, it is hard to explain linguistic change in the first place. If at every moment a language can be described as a self-contained system of abstract syntactic rules, changed utterances can never be understood. Language would thus never change, while it is clear that it does; linguistic change happens continuously and is not dependent on the birth of new generations that acquire new variants of a language. It seems that also full grown language users are able to change the knowledge of their language.

This leads to the second problem: in a self-contained system it is also impossible to explain how the linguistic knowledge of a single speaker can change over time. It is often observed that a person's way of speaking changes, due to whatever influences. A person's dialect may change, or he or she might start using constructions that sounded ungrammatical to them before, even new jobs or new relationships may lead to the change of linguistic performance. This cannot be explained by a theory that adopts a self-contained system of abstractions.

A third problem that is related to previous two is that it is not explained how it is possible that language users seem to make linguistic reanalyses. In linguistic history it is often seen that a certain construction is reanalysed as another construction; stated bluntly, the wrong syntactic analysis is made. If such a misinterpretation is made by enough people, it may become a new standard. A morphophonological example of reanalysis in Dutch is the word 'schoen'. This word was a plural in middle-Dutch. In English and in German it is still seen that the word is derived from the word Schoe (English Shoe, German Schuh). In Dutch the plural is formed by adding -en. However, if a word ends in a vowel, the plural was formed by adding only -n. Following this analogy the plural form of Schoe would be Schoen.

In seventeenth century Dutch, however, this rule changed. Words existing of only one syllable also received -en, such as Zee (Sea), Zeeën. When this rule was completely accepted, the word Schoen was no longer interpreted as plural, since there were no more words existing of only one syllable that were plural.

The word was thus reanalysed as a singular, and the new plural became Schoenen (Philippa, 1999: 37). The notion of reanalysis will further be explored and experimented in chapter 6.

Lastly but not less important is the problem that in a self-contained system it is also hard to explain how a person can ever learn an entirely new concept when his linguistic competence can be defined in a closed system of abstract rules. It would mean that all concepts that a person's thinking may ever employ, must already be definable in terms of the algebra of elementary concepts and operations of a person's "language of thought". This problem is known as Fodor's paradox (as cited in Scha 1990: 13) and strange as it may sound the paradox is widely accepted in GG and regarded as evidence for innateness principles (Scha 1990: 13).

1.1.2 AUTOKNOW

One of Chomsky's most famous dichotomies is the competence-performance distinction. Chomsky states that knowledge of language, which he calls the competence, can and should be characterized independently of language use, which he calls performance. This idea is also referred to as AUTOKNOW (Newmeyer, 1998:24).

The autonomous syntactic rules (AUTOSYN) that Chomsky assumes, along with the lexicon, is the actual linguistic competence. To repeat what already has been stated above: Chomsky thus assumes that the human linguistic competence exists of two modules. On the one hand there is a device that contains highly abstract syntactic rules that are independent of semantic

and frequency information. On the other hand there is the lexicon, from which lexemes can be taken to apply in the syntactic rules. Thus, in collaboration with the lexicon, where lexemes as well irregular forms are stored, this competence is a generative grammar for every linguistic utterance that a human being produces. The sentences that are produced are referred to as the performance.

As opposed to the competence, which is an ideal reflexion of the spoken language, the performance is only a vague reflection of his competence. It is influenced by many cognitive apparatus and physiological influences and is therefore full of mistakes and unfinished sentences. (Chomsky, 1957: 21)

In order to account for the human linguistic performance, the competence must be the focus of inquiry of linguistic research. And as the lexicon is only language specific and thus not universal of nature, especially the syntactic content of the competence is of interest to linguistics. It is thus the task of the linguist to find the underlying abstractions of a language. If this is done extensively and without reference to language specific constructions, Chomsky expects that the Universal Grammar (UG), that is innate to every human being, will be revealed (Chomsky 1957: 7).

1.2 Language acquisition.

In GG, the acquisition of a language is seen as the development of the competence. This process is seen as the acquisition of the autonomous syntactic rules as well as the growth of the lexicon.

The complexity and scope of the syntactic rules that are acquired by young infants bring about two theoretical problems that are discussed by Chomsky (1986: entire book) extensively. Firstly there is Plato's problem, which is regarded as very relevant to language acquisition; secondly there is Orwell's problem, which is regarded as less important to linguistics, but is still mentioned and rather extensively studied by Chomsky. In the following paragraph these two problems will be addressed.

1.2.1 Plato's problem and Orwell's problem.

According to Chomsky linguistics has to deal with Plato's problem. Bertrand Russel defines this problem as follows (as cited in Chomsky 1986: xxv)

“How comes it that human beings, whose contacts with the world are brief and personal and limited, are nevertheless able to know as much as they know?”

Plato solved this problem as follows. Before a human being is born, its spirit is accommodated in the ‘world of ideas’ where it is able to get acquainted with every possible concept that can be of use in the world. Plato thus assumed that knowledge of everyday concepts, such as ‘triangle’, ‘horse’ and ‘purple’ but also more general knowledge of mathematics and philosophy was ‘innate’ or, as he formulated, ‘learnt before birth’.

An explanation as such would nowadays be considered as unscientific and absurd. However the problem that he proposed remains interesting for science.

According to Chomsky, Plato’s problem arises especially in linguistic processing and acquisition.(Chomsky 1986: xiv) He sees an enormous gap between language experience and language competence (Chomsky 1965: 10 and on).

In GG this poverty of the stimulus is regarded as the main evidence that language principles must be innate. Infants seem to be exposed to a relatively small amount of linguistic data to be able to acquire the language as fast and as well as they do. Or, as Chomsky (1971: 122) states:

“Compared to the number of sentences that a child can produce or interpret with ease, the number of seconds in a lifetime is ridiculously small”

This statement refers to the idea that after acquiring syntactic rules, the child is able to interpret infinitely many sentences, which seems as too much of a learning task that can be fulfilled by a human being.

This idea may be influenced by the idea’s of Karl Popper, the founder of modern humanity science, who stated that a generalization can never be verified, only falsified. When stating that all ravens are black, one can never be sure that this is actually true, because a generalization always refers to infinitely many observation that can never be carried out by a human being, or even the human race. The only thing that a human can do is falsify a generalization, when a white raven is observed.

This idea may have been of influence to the Chomskyan idea that when an infant acquires generalizations, which the syntactic rules are assumed to be within GG, they refer to infinitely many sentences that can never be perceived or produced within a lifetime. However, this is only speculation, since Chomsky does not refer to Popper in any of his books.

Coming back to Plato's problem, on the one hand there seems to be not enough time and not enough evidence for a child to acquire the amount of information that needs to be acquired for natural language. But there is a second problem that is addressed by Plato's problem, according to Chomsky. As was stated above, the linguistic performance of the speakers around the language acquiring infant is imperfect and full of ungrammaticalities and unfinished sentences (Chomsky 1957: 10). A child thus has no direct access to the linguistic competence of his parents.

Both of these logical problems of language acquisition lead Chomsky to assuming linguistic knowledge innate to the human brain.

However, next to Plato's problem, there is another problem that is relevant for language acquisition: Orwell's problem. Orwell's problem refers to the question why do we know and understand so little, even though the evidence available is so rich (Chomsky 1986, p xxv). This problem is called Orwell's problem as it refers to Orwell's book Nineteen-eighty-four, in which he describes a totalitarian regime in which there is great injustice and dishonesty of the government, which seems to be accepted by the inhabitants of the country even though it is very clear to them that they are suppressed and lied to.

For Orwell this problem mainly arises in political and religious context: why do people believe certain authorities when there is clear evidence that they are wrong.

In other words, Orwell's problem comes down to the problem that it seems unnatural for the human mind to reason logically; even when there is transparent evidence, people tend to stick to what they believe in and thus do not trust on their observation.

When this problem is applied to language acquisition it implies that even if a person were exposed to a large amount of clear language examples, it is not expected that he would abstract the correct syntactic rules from this data.

According to Chomsky this makes the acquisition of language even harder to explain, because on the one hand, human beings seem to acquire a language faster than is expected from the amount of evidence that is exposed to them (Plato's problem). Yet, on the other hand, it is not expected that they have a very strong deductive ability, because even when there is very clear evidence, human beings do not seem to reason logically (Orwell's problem)..

Adding up, it is not to be expected that humans are able to learn a natural language without innate principles.

1.2.2 AUTOGRAM

GG assumes a 'Language faculty' (LF), which is species specific and autonomous of other cognitive capacities of the human brain (AUTOKNOW) (Newmeyer 1998: 23). This LF is responsible firstly for the acquisition and later for the processing of language.

Chomsky distinguishes an initial and a steady state of language use. The initial state is the state of the LF when an infant is born and has no linguistic experience. The steady state is the state of the LF of an adult language user. The state in between these two states is the language acquisition.

The state of the LF of a new born child is the 'initial-state'. In this state, the Universal Grammar (UG) is available in the form of a set of universal grammatical rules that assist in the selection of the spoken language.

Chomsky does not elaborate on how the acquisition of language exactly takes place. He leaves the states between 'initial state' and 'steady state' for future researchers: "this realistic study is much too complex to be undertaken in any meaningful way today and that it will be far more fruitful to investigate in detail, as a first approximation, the idealized model outlined earlier [AUTOSYN] leaving refinements to a time when this idealization is better understood" (Chomsky & Halle 1968 – p331, as cited in Botha 1989).

This can be seen as a weak part of Chomsky's theory. However, we must be patient and wait for the refinements that will be outlined in the future.

The content of the UG module consists of principles and parameters. Principles define the architecture of any linguistic system, while parameters cover the variation of syntax within this language (Culicover, 1997: 4). One example of a principle is the principle of recursivity; it is believed by Chomsky that all languages show recursive patterning, which means that every slot of a sentence can be filled by a new sentence. Recursivity is thus a universal principle of language. An example of a parameter is the Null-Subject Parameter. This parameters refers to the observation that there are languages that obligatorily take subjects and languages that do not. In languages such as Dutch and English, the verb always needs a

subject, even when it is clear by the inflection on the noun who or what the subject of the sentence is, a noun or a pronoun is needed to express this subject. In languages such as Italian and Spanish, the subject can be left out when it is clear from the inflection on the verb which person is referred to.

The language learning infant is thus equipped with a set of these universal principles and parameters that he can test in a corpus of language data that he is exposed to.

These principles and parameters are so selective that only a small number of them needs testing before the right grammar can be chosen. In other words, after the testing of a small amount of grammatical rules, the infant 'knows' which language he is acquiring (Culicover 1997: 10). The principles and parameters are thus a means to facilitate the acquisition of language.

For the 'steady-state' language user the LF is the device that produces and interprets every linguistic unit that is possible in that language. Both for perception and production the set of syntactic rules along with the lexicon account for all linguistic behaviour. Chomsky does make another strong statement about the UG module. In GG it is assumed that there is a 'critical period' for language acquisition. Chomsky assumes that after acquiring the first language the UG will be unavailable for the steady state language user. This has two consequences. In the first place it seems to explain why people are generally never as proficient in a second language than in their mother tongue. In the second place it means that the knowledge of the first language cannot be changed anymore, which accounts for the fact that older people often use different forms of language than younger generations of the same language.

1.3 Summary and Discussion

Chomsky regards language as a cognitive capacity that is specific to humans and is independent of other human cognitive capacities (AUTOGRAM). The human brain is equipped with an innate set of universal grammatical (UG & innateness hypothesis) principles and parameters that help the infant in the acquisition of language. After acquiring the first language, the UG module is not available anymore for the acquisition of a second language. Chomsky regards the adult language competence as a set of syntactic rules, which are independent of semantics and frequency (AUTOSYN). The syntactic rules along with the lexicon describe the human linguistic competence, which is independent of the linguistic

performance, which is only a vague reflection of the competence as it is influenced by many cognitive devices (AUTOKNOW).

All of the assumptions of Chomsky that are described in this chapter, are proven to be more problematic than is expected by Chomsky. All three autonomy hypotheses are highly debated and also the innateness hypothesis is often argued against.

In the following chapters most of the hypotheses will be addressed.

Firstly and most importantly, the innateness hypothesis is often refuted. It seems that at the age of 12 (Pierrehumbert 2003: 1) there is still a great amount of linguistic structures to be learnt. It can even be argued that language acquisition lasts a lifetime, which means that there might be a continuum between early and later stages of language use. In Chapter 2 and three ET (Johnson 1992), DOP (Scha 1990) and the L2LP theory (Escudero 2005) will be discussed, which are theories that actually regard language as learnable. Theoretically a theory that can account for language without making use of inborn capacities is preferred above a theory that does.

Chomsky, however, does not seem to have a response to the fact that language seems learnable. Rather, he sees it as an insult to human evolution to reject the innateness hypothesis, as can be seen in the following quote. “[...] there is surely no reason today for taking seriously a position that attributes a complex human achievement² to months (or at most years) of experience rather than to millions of years of evolution.” (Chomsky 1965: 58-59).

A related matter is the steady state of language, as is proposed by Chomsky. Chomsky believes that there is a critical period, after which it is no longer possible to use the UG module for language acquisition. This idea contains many assumptions that are debated by other theories. ET and DOP, which are discussed in Chapter 2, do not accept the UG module at all, but also they reject the critical period hypothesis, but see language acquisition as a continuous process throughout life. Also L2LP (Escudero 2005), which is discussed in Chapter 3, rejects the UG module as well as the critical period hypothesis, although this theory does assume a sort of end-state to language acquisition. Lastly the L2UG theory

² Namely, the acquisition of language

(White 1989), does assume the UG module, but rejects the critical period hypothesis. This theory will be described in Chapter 4.

But also other fundamentals of Chomsky's theory are debated, namely the existence of the syntactic rules, that are assumed to be the main component of the linguistic competence. The cognitive reality of grammatical rules can be argued by ET (Johnson 1997) and DOP (Scha 1990). These theories state that there is no abstract but only concrete knowledge of language in the human brain. This possibility is discussed in Chapter 2.

But even if grammatical rules do have a cognitive representation, it can be argued if it is independent of semantics and frequency, as is proposed by Chomsky's AUTOSYN hypothesis. Especially by Functionalist Grammarians such as Simon Dik and Talmy Gívon it is stated that as the main function of language is to convey meaning, it is highly unexpected that syntax would be independent of meaning. However this debate is not of direct interest for the discussion in this study and will therefore not be extensively addressed here, although it will be mentioned in the discussion in Chapter 5.

Next to the independency of semantics, it is also debatable if there is no influence of frequency on linguistic processing. Theories such as ET (Johnson 1997), DOP (Scha 1990) and L2LP (Escudero 2005) assume an important role for frequency effects in linguistic processing as well as acquisition. This can be found in Chapter 2 and 3.

Last but not least, as was mentioned above, if linguistic processing can at every moment be described as a closed set of rules, it is impossible to account for linguistic change. This problem is addressed by ET and DOP, which are discussed in chapter 2. Also a small experiment regarding linguistic change will be conducted in Chapter 6.

Chapter 2.

Exemplar theory (Keith Johnson 1992, 1997) and Data-Oriented Parsing (Remko Scha 1992)

2.0 Introduction

Exemplar Theory (ET) (Johnson 1997) and Data-Oriented Parsing (DOP) (Scha 1990) state the opposite from Generative Grammar (GG); ET from a phonetic and DOP from a syntactic perspective.

In exemplar theories, in which memory and frequency play an important role, language is seen as a non-analytical system of stored examples. So, instead of storing an abstract category of a certain sound, containing for example possible formant values, ET suggests to store every instance of the perception of a sound. ET thus moves categorization to decision time. In other words, every time a sound needs to be analyzed or produced, a large number of exemplars of similar sounds along with their meanings are retrieved and thus the analysis is made.

DOP proposes the same mechanism for syntactic processing. There is no mental representation of grammatical rules, instead every sentence is stored along with its parse.

This approach challenges all of the assumptions from GG.

Firstly, ET and DOP reject the assumption of AUTOKNOW. The AUTOKNOW assumption of GG states that there is no opposition of competence and performance, however in the ET/DOP approach the performance is actually the competence. ET and DOP both assume that a language user has access to his or her complete linguistic experience.

Secondly there is no opposition of acquisition versus processing; this is a continuum. ET and DOP thus both reject the existence of a steady state of linguistic knowledge; both theories suggest the storing of the complete linguistic experience of a speaker. This implies that every piece of newly stored data may influence the knowledge of language that is at hand to the speaker. This storage is a continuous process that is not only related to acquiring first or second language. Consequently, also the knowledge of a L1 changes continuously, thus also after puberty.

Thirdly the ET/DOP approach also rejects the AUTSYN hypothesis. In the first place it is rather questionable if ET and DOP recognize the existence of grammatical generalizations at all. However, it is believed in both approaches that the forming of categories takes place at decision time. In other words, every time a sentence needs parsing or a phonetic string needs to be understood, a large bulk of similar information is recalled and thus a generalization is made. Most importantly, both of these theories recognize that the human mind seems to be extremely sensitive for frequency distributions, so the storage of data happens in accordance

with frequency. This idea rejects the AUTSYN hypothesis, which states that grammatical processing is independent of frequency.

Lastly, the ET and DOP approaches reject the innateness hypothesis and also the AUTOGRAM hypothesis. As was mentioned in chapter 1, ET and DOP see language as learnable, instead of innate, and believe that by storing linguistic data along with a general willingness of the human mind to categorize, language can be acquired. DOP does assume a language faculty, but it only contains of a matching device that compares old and new data from a more general memory of the human brain. All these ideas will be further elaborated below.

2.1.1 Speaker variability

Phonetic science has to deal with the problem of speaker variability. It seems that speech is highly variable both within and between speakers (Johnson 2005: 1 and on). Still it seems that listeners are able to interpret this highly inconstant data seemingly without effort.

When measuring formants of vowels it seems that men, women and children have great overlap in their formants. The exact *same* formants can be measured for two vowels, produced by two speakers, interpreted as two *different* sounds. The most dramatic example of this is shown by a study reported by Peterson and Barney (1952: 182).

Figure 1 shows the F1's and F2's of women, men and children and all of the vowels represented in the figure were correctly identified.

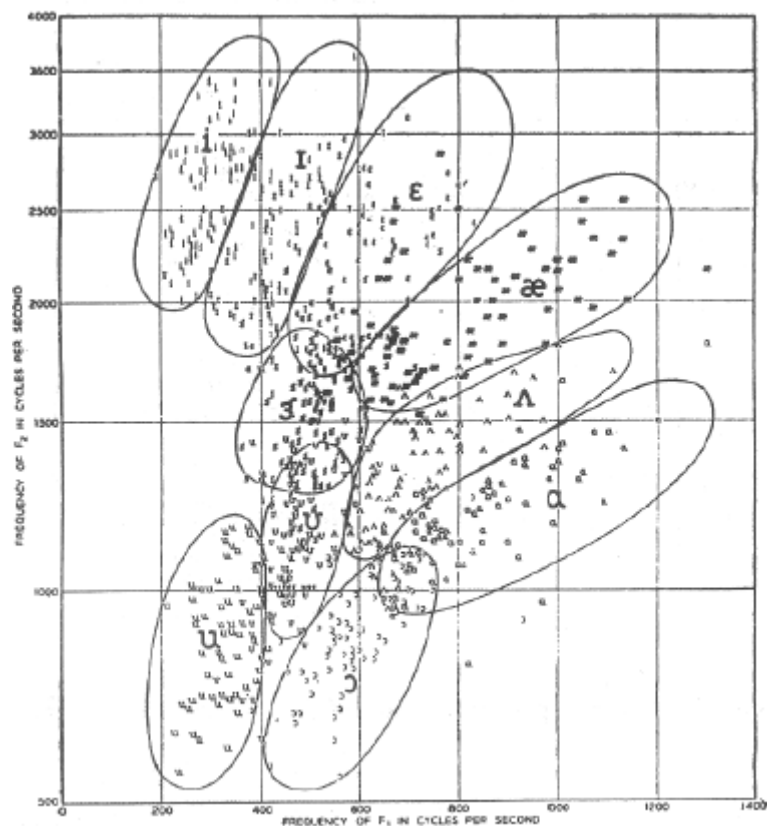


Figure 1. Overlap vowel formants from the Peterson & Barney study (1952: 182)

Speaker variability poses a problem for phonetics, because if there is so great variety among speakers of a language, it is hard to explain how an abstract representation is able to cope with this variability. Johnson's paper *Speech Normalization in Speech Perception* (2005) makes a collection of the different accounts that have been proposed to solve this problem.

There seem to be many factors of influence to the identification of vowels. Listeners seem to rely on F0 values, relative formant values, gestures of the mouth, relative formant frequencies, vowel length, context, talker voice normalization, talker vocal tract normalization, gender differences, voice as well as face familiarity, frequency and memory. All these factors are highly abstract features of the speech signals and cannot be observed consciously by listeners. However, listeners can shift their attention to different aspects of speakers and sounds, when they are assigned to do so (Johnson 2005, 3 and on). It seems that there are almost unlimited possibilities of in speech comprehension. ET poses that if listeners can actually cope with so many different aspects of the speech signal, this would mean that the abstract knowledge must be very elaborate. The abstract knowledge might be so extensive that it would make linguistic

processing too complex. ET thus poses that abstraction is actually less efficient than literal storage. (Johnson 2005: 147)

ET proposes to store every exemplar of a sound along with its meaning. In this way a great corpus develops with language experience. This corpus exists of pieces of language along with linguistic information, such as meaning, formant values and non-linguistic information, such as frequency and identity and gender of the speaker. ET suggests that *all* information that can be of help for evaluating new data is stored along with every exemplar (Johnson 1997: 149).

The main argument for the storage of such enormous quantity of data is mainly the fact that it seems to be possible. Conezio & Haber (As cited in Johnson 1997: 147) found that thousands of previously seen pictures were remembered with accuracy and over a long period. In the Conezio & Haber experiment pictures were shown to children between three and seven years old, which turned out to be remembered in a second testing as an adult (as described in Hofman & Dick 1976: 794). Also Goldinger (1997: 59) found that implicit memory for words is strong and long-lasting.

If it seems possible to store so much information, this would make the storage of abstractions redundant. ET suggests a linguistic processing mechanism that efficiently makes use of concrete linguistic data instead of abstract representations of this data. ET poses that non-analytical processing is a more efficient manner of dealing with already stored data than using complex abstract representations.

2.1.2 Ambiguity

Syntax seems to deal with a similar problem. In the current computational language processing systems, the problem of ambiguity arises. This ambiguity problem refers to the fact that computational grammars that process on the basis of abstract grammatical knowledge come up with too many interpretations (Scha 1990: 5).

A highly simplified example will be given. A computational grammar that is based on the Chomskyan paradigm may consist of the following rewriting rules.

$S = NP + VP$

$S = VP + VP$

$NP = N$

$VP = V + NP$

$NP = Det + N$

VP = VP + PP

VP = VP + ProP

ProP = Pro + Adj

VP = V

PP = Prep + NP

N = John, apple, school

V = eats, going, makes

Det = an

Prep = to

Pro = me

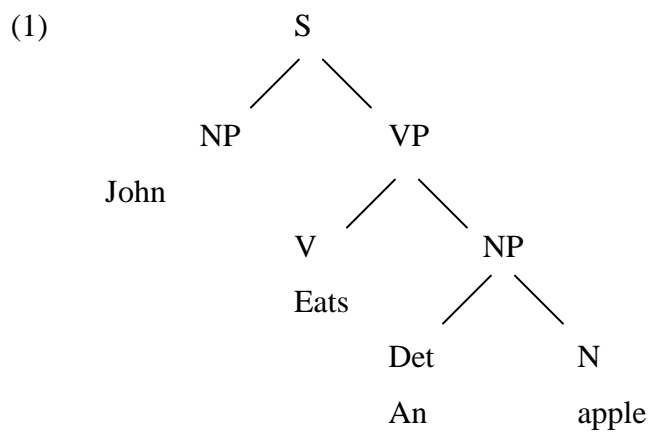
Adj = tired

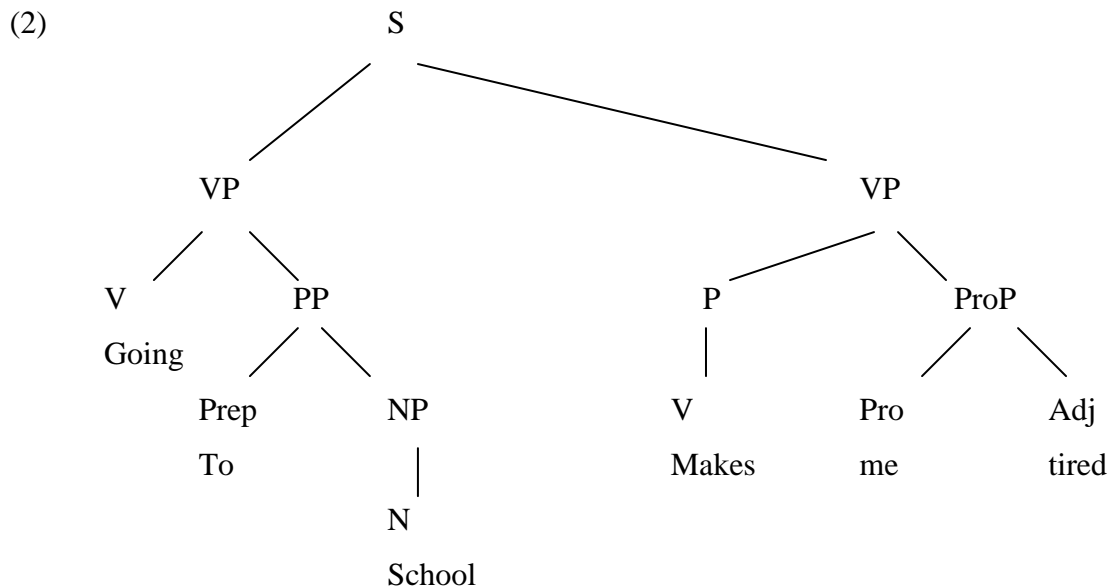
A grammar like this would be able to parse a sentence like:

(1) John eats an apple

(2) Going to school makes me tired

The parsings would look as follows





These two sentences cover a rather small part of the English highly complex grammar. However, it turns out that as soon as a grammar covers a non-trivial part of grammar, there are too many possible analyses for every sentence; actually many more than a human language user would ever make. Rens Bod, who has done much research and implementation on the DOP model, mentions that for an average sentence of nine words computational grammars, like the above, often make hundreds of interpretations that a human language user apparently would never make (Scha 1990: 5, Bod 1992: 855).

When looking at the generative grammar above it is easily conceivable that the problem lies especially in the fact that even for this trivial grammar there are already three different VP's possible. The high variability of constituents may cause for too many different parsings. Summarizing, it turns out that, when computing language, there is much more ambiguity in superficially simple sentences than expected.

If there is so much ambiguity, the rule-based approach appears highly inefficient, since next to the grammatical rules, a second mechanism is required to choose the correct interpretation from all the possible interpretations that the set of grammatical rules has generated. Human language users do not make so many interpretations in the first place; they seem to make use of non-grammatical factors such as context to make the right interpretation (Scha 1990: 5).

Scha (1990: 7) proposes the exact same solution as ET. Thus, he suggests that every analyzed sentence is stored along with its interpretation and frequency. The database that develops will thus contain parsed sentences.

For the parsing of new sentences, there are a number of options.

Is the sentence stored in the exact same form, the parsing is easy: the same analysis will be chosen as for the stored sentence.

If the sentence is very different of every other sentence that is stored, many different chunks of other sentences that are similar are retrieved along with their frequency and this is expected to lead to the correct analysis of this sentence structure (Scha 1990: 9).

To make this idea a bit more clear. Chomsky's 'I goed' example from Chapter 1, may come to use.

A parsing, or in this case an utterance is needed for a certain sentence, in this case '[I go]+PAST.

The ideal situation would be that an exact copy of the sentence with this analysis is found.

Unfortunately this is not the case. The language user will thus collect as many sentences with similar features. In the case of [I go]+PAST it is expected that the following two exemplars may provide the needed information.

I go	[I go]
I walk	[I walk]
I walked	[I walk]+PAST

Given this data, the most logical option for [I go]+PAST would be: 'I goed'.

It is interesting to see that the DOP and the ET model thus reject the relevance of Orwell's problem for language acquisition, which Chomsky does regard as relevant. Orwell's problem stands for the human inability to induce logically. In ET and DOP the human brain is expected to be able to make logical deliberations, albeit unconsciously.

The DOP approach solves the problem of ambiguity as follows. In the case of ambiguity the option with the highest probability will be chosen. For the setting of probability values, DOP expects it to be most efficient when the system regards context and frequency of perception

(Scha 1990: 10). DOP thus rejects the AUTOSYN hypothesis which states that grammar is independent of frequency.

Summarizing, the DOP mechanism analyzes new data by means of matching with stored exemplars. If that leads to ambiguity, the analysis is chosen that matches most with the context or the general frequency values of the stored data.

2.2 Competence is performance

The exemplar approach rejects the AUTOKNOW assumption, the assumption that linguistic knowledge is autonomous of linguistic use. ET and DOP regard the language competence as a collection of a person's linguistic experience. The theories assume that a language user stores and has access to his complete linguistic experience. (Johnson 1997: 145, Scha 1990: 10)

In ET and in DOP it is expected that along with this concrete language data, semantic and syntactic analysis and context and frequency information are stored as well. According to the two theories this is the way to solve ambiguity and speaker variability. ET and DOP believe that the storage of concrete data will be of better help to solve ambiguity than computation with abstract rules. The concrete data will provide an online analysis, and in case of ambiguity context or probability values may provide for a solution.

Language, in both of these theories, is thus not seen as a system of abstract rules, but an agglomeration of concrete language data. However, the theories do not reject the existence of grammatical rules, but do not regard them as cognitively real (Scha 1990: 16). This should be seen as follows; it can of course not be denied that there are grammatical rules, since they are taught in schools as well as to L2 learners. An example of a grammatical rule is that the English past is formed by adding –ed to the stem of the verb. In ET and DOP however, it is believed that there is no added value for a language user to represent these rules cognitively; the concrete data are believed to speak for themselves.

Scha even mentions the possibility that there is not one grammar in a language but a diversity of grammars: "It is very well possible that the language system is a non-deterministic conglomerate of incompatible but overlapping "subsystems"." (Scha 1990: 14). Here DOP stands in straight opposition to GG, who regards language as a self-contained system that is deterministic and analogous.

The corpus that constitutes the linguistic competence is very elaborate. Johnson himself (1997: 152) claims that the weakest part of ET is what he calls the 'head filling-up problem'. However no opponents of ET are found that argue that a corpus as suggested in ET and DOP is too extensive to be efficient for the human mind to deal with.

Pisoni, a phonetician who has done research on ET, claims that the great variety of the stimulus is actually a means of interpretation. That is, he argues that the more instances of the speech of different speakers are stored in the corpus, the easier it will become for a listener to correctly identify a new signal (Pisoni, 1997: 10).

Pisoni (1997: 9) also brings into debate that even the most sophisticated state-of-the-art speech recognition systems cannot compete against the efficiency in which a human listener can adapt to different speakers, rates, styles and background noises. The fact that there seems to be evidence for a large amount of stored knowledge of different speakers, is seen as evidence that storing is the actual device to make processing faster instead of slower (Pisoni, 1997: 11).

So, if the extensiveness of the database does not make the processing slower, but actually faster, according to ET, the question remains how this speed is expected to come about. However, it remains rather unclear what exactly the architecture of this database as proposed by ET and DOP would be.

Unclear as they may be, the non analytical approach of the two exemplar-based theories could be interpreted as non-linguistic theories, because the storage and retrieval of information is not necessarily a linguistic process. If linguistic processing is a matter of matching stored items, it seems that learning how to speak, learning what is the meaning of the word yellow and learning how to ride a bike might be rather similar processes. The learning of language in ET and DOP is like any other human learning task and is thus not domain specific but domain general. Scha (1992: 7) states the following about this: "[the learning of language] is thus not a capacity to learn or apply a grammar -- it is the capacity to project structure onto new input or output, and to allow past experiences to play a decisive role in this process. To what extent this language processing capacity differs from other cognitive/perceptive capabilities is an empirical question that we do not know much about."

Unfortunately ET as well as DOP remains unclear about the consequences of their proposal for linguistic theory. DOP however, is a little bit more extensive on theoretical consequences.

Interestingly enough, DOP does not reject the assumption AUTOGRAM, which states that linguistic processing is independent of other cognitive capacities. DOP does assume a language faculty (Scha 1990: 16). The storing of knowledge that Scha expects to be the linguistic competence is done by the language faculty. However, Scha makes no statement as to whether this LF is innate to the human brain. No such claim is made or rejected by ET either.

Scha does explicitly mention that it is the matching-algorithm that is the main language capacity of the human brain (Scha 1992: 10) This is important, especially since it gives some insight in the proposed design of the Language Faculty (LF) that is assumed in DOP. It is thus not the storing but the matching that is the main task of the linguistic capacities of the human brain. If the DOP system required a language faculty that stores every sentence, the argument of increased efficiency would not hold. It would only imply extra storage; every sentence would need to be stored in the linguistic as well as the non-linguistic memory. When the LF is only the matching device that is able to handle data from a more general memory, it would indeed be a solution for the seemingly great amount of stored data, as is suggested by studies such as Conezio & Haber (1970).

2.3 Language acquisition as a continuum

The most attractive consequence of the exemplar based approach is perhaps the simplicity of language acquisition. In a system where the only linguistic processing is the matching of new sentences with old ones, acquisition means only storage.

Following the principle of Occam's razor, ET and DOP's proposal seems much more plausible than Chomsky's for a number of reasons. Firstly the method of language processing proposed by exemplar-based theories seems less complicated, because the stored data are concrete language data instances instead of abstraction categories. The computation of linguistic data is thus based on concrete instead of abstract knowledge.

Secondly, the acquisition process in ET and DOP can be seen as simpler than GG's proposal because it requires only the storage of these concrete data. That is, there is no need for the complex enterprise of setting parameters and finding abstractions in the available data.

However, it could also be argued that the enterprise of storing may be more laborious than the process of abstracting. It may actually be that abstraction is only a means of making storing more efficient. This idea will be more extensively discussed in chapter 5.

Scha (1990: 16) mentions an interesting problem for early language acquisition: how does the parsing mechanism work when there is no corpus yet? An important inference that DOP makes is that the processing of language is dependent on the content of the corpus. This brings about a paradox for the earliest stage of linguistic experience; if every language exemplar is stored along with its analysis, how is the first analysis made?

Scha (1990: 16) suggests that for syntactic bootstrapping, the earliest stages will be highly semantic and pragmatic of nature. Gestures that parents make as well as frequent repetition of sentences like “Eat cookie” and “Eat banana”, might lead the infant to invent, by means of meaning and pragmatics, what the meaning of these words might be. In the first analyses the child is thus not abstracting syntax but meaning.

According to Scha this idea accounts for the fact that early language users are not able to make grammaticality judgments, whereas language users with more experience do. (Scha 1990: 16)

Scha’s idea seems to be supported by research from Tomasello (2000, 2001), who formulated the “Verb-Island Hypothesis”, which is similar to Scha’s idea of early language acquisition. The Verb-Island Hypothesis claims “that children’s early language is organized and structured totally around individual verbs and other predicative terms; that is, the 2-year-old child’s syntactic competence is comprised totally of verb-specific constructions with open nominal slots.” (Tomasello 2000: 213-214) In longitudinal as well as corpus-based investigation of a number of children’s language acquisition, Tomasello (2000, 2001) found evidence for this Verb-Island Hypothesis, which also suggests Scha’s idea that the first analyses are dependent on meaning and not of syntax.

For the sake of the discussion in this study, it is important to mention here that DOP and ET both do not assume any innate linguistic knowledge, but instead regard language as learnable. The only thing that they might assume innate, although not stated explicitly, is a general willingness of the human mind to categorize. Scha formulates the following innate principles: “It is thus not a capacity to learn or apply a grammar -- it is the capacity to project structure onto new input or output, and to allow past experiences to play a decisive role in this process.” (Scha 1992: 60).

However, in an exemplar based language faculty there is no real acquisition of language. There is actually a continuous acquisition of language. Every incoming sentence influences and thus changes the linguistic knowledge of the speaker.

However, because the corpus is smaller in earlier language use, relatively more change in production is expected over time. The increase of complexity of language production is in straight correlation with this language user's linguistic experience (Scha 1990: 16). Yet there is no real steady state of language, as Chomsky presumes. The steady-state hypothesis of GG expects that the acquisition of language can be 'ready' at a certain time. This idea is rejected by ET and DOP, who regard the knowledge of language in the human mind as a changeable database of concrete language instances.

Thus, in exemplar-based models, the processing of language is viewed as a continuous process of change. Given that all incoming data is stored, one's knowledge of language is subject to continuous change (Scha 1990: 14).

In later stages of language use, however, the frequency of a given exemplar is not likely to change as drastically as it does in earlier stages of language use. In a larger corpus it will be more difficult to influence probability values. With the growing of the corpus the possibility of drastic changes decreases, this is compatible with the observation that older people tend to speak in a more 'old fashioned' manner. In possibly eighty years of linguistic experience, their corpus exists of such large amounts of exemplars that the utterances that they perceive in their present environment will not have much influence on their knowledge of language and thus their production anymore.

About second language acquisition not much can be added. In the ET and DOP models, a second language is expected to be learnt slower because there is already a corpus available of a first language. This L1 corpus analyses incoming data and thus makes acquisition of a second language a slower and more demanding process than the learning of a first language. Still, the exemplar theories expect that after enough exposure also the second language will be acquired by means of storage.

2.4 Summary and discussion

In this chapter it was discussed that there are serious alternative approaches to GG. DOP and ET reject Chomsky's AUTOKNOW hypothesis. They do not regard language performance as being separate from language competence, but these two concepts are seen to refer to the same thing. This is because, within ET and DOP a person's entire linguistic experience is stored, and this storage knowledge is used at all times when processing new and old language items.

ET and DOP also reject the idea of abstract knowledge of grammatical rules, as is assumed by Chomsky. Both phonology and syntax meet a problem when only using abstract rules as a manner of processing. The phonetic problem of talker variability is the problem that, when using only abstract phonological rules, it is hard to explain how the great variety of speakers can be understood. The syntactic problem of ambiguity, states that it is impossible, at least for a computational grammar, to make the right syntactic analysis when only making use of syntactic rules. ET and DOP take these two problems as evidence that concrete language data must be stored instead of an abstract version of it.

On the one hand this approach gives an interesting view on language acquisition. Firstly, these two examples of exemplar-based theories regard language as learnable, as opposed to Chomsky, who considers language to be innate to the human mind. Secondly, if language acquisition is 'only' the storing of concrete language data, this seems much simpler because there is no need for abstraction, which is considered a complex matter. And thus, this approach is much more of a plausible process than the acquisition of language as proposed by Chomsky, which involves a lot of computational effort and inborn principles and parameter.

On the other hand there is the 'head filling-up problem'. This problem refers to the fact that an enormous amount of memory as well as a astonishingly efficient retrieval mechanism is required for the ET and DOP approaches. Although within the ET paradigm much research is done in order to show that much data is actually stored in the human brain, this is not convincing. Common sense thinking leads to doubt if a database consisting of a person's complete linguistic experience would be an efficient system for the human mind to handle. Every person knows that it is not a realistic belief that everything that is encountered in life is actually stored. It seems that many things are also forgotten. ET and DOP do not seem to have clear solutions for this, although they do suggest that when stored data become older they can

be replaced by new data. Still this seems only a part of a solution as it seems that also from the events that people encounter everyday, not everything seems to be stored.

A second problem that arises in the ET/DOP approach is that there actually seem to be categories. People do seem to have some abstract knowledge of language that they can consciously address. When asking a person what a noun is, this person will probably give a prototypical description that contains matters like: something that is tangible or something that can be preceded by the word 'the'.

In the following Chapter the L2LP model is discussed that leaves room for abstract as well as exemplar processing.

Chapter 3.

Second Language Linguistic Perception (Paola Escudero 2005)

3.0 Introduction

The theory of Second Language Linguistic Perception (L2LP) (Escudero 2005) explains phonetic processing and acquisition. This model is derived from the Linguistic Perception (LP) model is the name of a model that combines Boersma (1998, as cited in Escudero 2005: 41), Escudero & Boersma 2003 and Boersma, Escudero and Hayes 2003 The LP model makes the difference between linguistic and non-linguistic perception explicit.

The distinction between linguistic and non-linguistic knowledge implies abstract knowledge, since it suggests that there is a linguistic system that maps the speech signal to abstract categories. The LP model does not reject the possibility that there are abstract representations for non-linguistic categories but it expects that they are different in representation than linguistic categories. Examples of non-linguistic phonetic categories may be ‘octaves’ or ‘loud’, while linguistic categories are meaningful elements for language, such as the phonetic category /high/ or the syntactic category /noun/ but also more abstract categories such as vowel and consonant.

The L2LP model is especially interesting for the discussion in this study for a number of reasons. In the first place, it assumes language to be learnable instead of innate, as was suggested by ET and DOP. However, and in contradiction with these theories, the L2LP model does assume abstract grammatical representations to be an important component of adult linguistic processing. The model thus departs from Chomsky’s innateness hypothesis and also from ET and DOP’s storage assumption.

Despite the existence of abstract representations within its proposal, the L2LP model does assume a role for exemplar learning in language acquisition. That is, within this model the process of sound acquisition is two-folded. In the first stage, language learning is an exemplar based process, while in the second the acquisition of grammar is based on abstract knowledge. Thus, within the L2LP model exemplars are seen as a means to acquire the abstract knowledge that is needed to process language in an adult-like manner.

Another interesting component of the L2LP model is that it assumes quite a strong integration of the acquisition and the adult processing of language. The diversity of constraints that are found in the human language mechanism, as proposed by the L2LP model, are seen as a result of the acquisition process. Different phases in the acquisition process refer to different constraints that are used in linguistic processing; for example, in the earliest phase there are

only exemplar like constraints that consist of values of the sounds in the environment, while later in the acquisition process more abstract constraints appear that refer to vowels in the vowel system. This will be further explained below.

In a certain way it can be thus argued that the L2LP model is an intermediate approach between the GG and the ET/DOP models. This is because, on the one hand, there is a place for exemplar processing, while, on the other, there is also room for abstract processing. In the following paragraphs the L2LP model will be presented.

3.1 The adult comprehension system

The Linguistic Perception (LP) model, on which the L2LP is based, assumes that in there is a linguistic grammar that underlies speech perception. An important argument for the linguistic nature of this grammar is that ‘the mapping of the speech signal has a systematic and language specific nature’ (Escudero, 2005: 42). Boersma (1998, as cited in Escudero 2005: 42) proposes that a model for adult speech comprehension which consists of three representational levels. Firstly, the auditory input, which is interpreted by the *perception grammar*. Secondly, this perceptual input, which is interpreted by the *recognition grammar*, is mapped to the third level, namely, the lexical representations.

What is interesting about this theory is that it assumes the processing of auditory, phonetic input before the processing of perceptual phonological input. In other words, speech perception is assumed to be completely bottom-up, without the interference of the lexicon. This is not the case in theories such as DOP and ET because they assume that the stored knowledge will be of influence to the interpretation process. In other words, in exemplar-driven language processing, the system will prefer to find an exact copy of the incoming input in the memory. In such theories there is thus a top-down interference of the lexicon assumed (Scha 1990: 10).

The three levels of the LP model in the adult linguistic competence are seen as follows. A perception grammar interprets the incoming signal as a phonetic string. For this interpretation four types of constraints are needed, which have different levels of abstractions from rather concrete exemplar-like constraints to highly abstract constraints that refer to categories. These four types are a result of the acquisition process and will thus be described in § 3.2 in which the acquisition process is discussed.

The output of the perception grammar serves as input for the recognition grammar that maps the phonetic strings to underlying representation.

The recognition grammar maps abstract phonological categories to lexical representations or underlying forms. In the recognition grammar the vowel system of a language is found. These perceptual representations are highly diverse among languages. They are different in the amount of vowels that are represented in it, but they also show variation in how many acoustic dimensions are represented.

In the lexicon all meaningful items are stored that are required for linguistic processing.

3.1.1 Exemplars or abstractions?

In the ET/DOP approach exemplars and abstractions are presented as if they are a dichotomy. The L2LP model shows that there is a more subtle border between the two. It could even be argued that it appears that there is a continuum from exemplar to abstraction.

The units of processing that are proposed in the L2LP model are not literally exemplars and at the same time not exactly abstractions either; the constraints in this model mediate between these two notions.

In the earliest phase of acquisition, when the one-dimensional auditory-to-auditory constraints are used, the constraints that are assumed by the L2LP model are the most similar to exemplars as proposed in ET. Still, because the sounds are represented by concrete values of the sound, there is some level of abstraction.

ET and DOP suggest that there is no abstraction at all. Even though the ET/DOP approach does assume that *along* with the linguistic unit that is stored relevant information such as meaning and analysis is stored as well, the literal sound is stored. In the ET/DOP model it is thus expected that the sound is stored along with *all* its acoustic values. The L2LP model, however, expects that there is already an abstraction, in that the values of the signals are stored instead of the literal signal.

Still the storage of concrete values, as is proposed by L2LP, comes much closer to an exemplar than to an abstraction. However, the proposed model clearly shows the theoretical complication that there is not a strict border of what is an exemplar or an abstraction. Models that use abstractions as units for linguistic processing are generally quite elaborate on how they conceive such abstractions. In an ideal situation models that make use of exemplars should also define as precisely as possible what they mean by an exemplar. This is not explicitly done in ET and DOP.

3.2 Acquisition of L1

As the interpretation of language is assumed to be a bottom-up process, also the acquisition of language is assumed to take place in a bottom-up manner in the L2LP model. In other words, it is acquired without any inborn knowledge of language (Escudero 2005: 43). This learnability is also expected in models such as ET and DOP. However there is a great difference between these two approaches, because the L2LP model does assume abstractions to play a role in linguistic processing, while ET and DOP do not. In this paragraph it will be presented how the L2LP model expects abstract knowledge to come about without the use of innate knowledge.

3.2.1 Exemplars as a means of acquiring abstract knowledge

According to the L2LP model, language is learnable; no knowledge of sound categories is assumed to be present at birth (Escudero, 2005: 66) and the acquisition of language is expected to develop from the interaction with the environment. However the L2LP model (Escudero, Boersma & Hayes 2003:1013) does assume the innate capacity to categorize.

This acquisition mechanism is instantiated by the Gradual Learning Algorithm (GLA). The GLA is believed to be a general learning device that is innate in the human mind and that tries to categorise different kinds of input (Escudero 2005: 68). Escudero explicitly mentions that the GLA is a general learning algorithm of the human mind, and is thus also available for non-linguistic learning (Escudero 2005: 112). A general learning mechanism is also assumed in ET and DOP.

Regarding L1 acquisition, the GLA is responsible for the acquisition of every linguistic domain, such as phonetics, phonology, morphosyntax etc. The GLA is thus responsible for every learning task in life and thus also for the complete acquisition of L1 and, as will be discussed later, also for L2 acquisition.

This capacity is expected to come about by storing exemplars. Exemplars are stored by means of the formation of constraints of the kind put forward within Optimality Theory (Archangeli, 1997: 1 and on). The following three constraints families are expected to play a role in acquisition according to the L2LP model (Escudero 2005: 44).

PERCEIVE – perceive the incoming signal

*CATEG – do not categorise the incoming signal

*WARP – do not change the identity of what you hear.

The PERCEIVE constraint family makes sure that the infant starts perceiving at all. This is undoubtedly necessary to start a process of language acquisition. The second constraint family, *CATEGORIZE refers to all the values that are perceived so that classification can take place; e.g. in the case of phonetic acquisition, these constraints refer to formant values, or any other phonetic property, such as duration or noise.

The proposal assumes that early language acquisition is uni-dimensional because it is claimed that for every sound that a child perceives, a PERCEIVE and a separate *CATEG constraint is formed, for every value of every phonetic property of such sound (Escudero, 2005: 67). It is thus proposed that in the earliest phase of L1 acquisition, a great number of these constraints are added to the infant grammar because, for every incoming sound, different constraints refer to a concrete auditory value along the dimensions with which speech sounds are produced.

The ranking of the constraints in the perception grammar is in accordance with the Optimal Perception Hypothesis (Escudero 2006: 52). This hypothesis assumes that listeners minimize the possibility of misunderstanding the intention of the speaker, by ranking the constraints that are present in the grammar by probability. This ranking according to probability plays an important role in acquisition but also in later phases of linguistic experience.

However in this stage the constraints are one-dimensional as there is only one dimension that is represented by each constraint.

It is important to note that adult listeners seem to combine many acoustic dimensions when processing the speech signal, e.g. F1, F2 and duration. It is thus important to show that the model can account for the development which allows for the integration of multiple auditory dimensions in the perception of sounds, which can be observed in adult listeners (Escudero 2005: 48). The LP model proposes a gradual increase in complexity of the constraints during language acquisition. This process will be described below.

The interaction of the three constraint families, along with the GLA and the willingness of the infant to perceive optimally (Optimal Perception Hypothesis) eventually leads to the formation of auditory categories (Escudero 2005: 68). As was mentioned above, it is believed

that during acquisition there is an increase of abstraction and an integration of the acoustic dimensions. This increase correlates with different phases of acquisition. In addition, it leads to the four different types of constraints that are assumed to be present in the perception grammar. This is seen as follows.

In the earliest stage of L1 acquisition the learning is driven by distributional frequency. As was mentioned above, the first constraints in the infant perception grammar are one dimensional auditory-to-auditory constraints. One dimensional means that a constraint contains only one acoustic dimension. Auditory-auditory means that the constraint is very close to the auditory signal; in other words, they exist of concrete values. Auditory-to-auditory constraints are thus the least abstract sort of constraints (Escudero 2005: 44). The Optimal Perception Hypothesis predicts that one-dimensional constraints are stored in the grammar and are ranked according to frequency. This leads to the groupings of constraints with frequent occurrence, which is the first step in categorization. In the L2LP model this is called *distributional learning*.

Escudero (2005: 71) mentions a number of scientific experiments in which evidence was found that children as young as six months are sensitive to frequency effects, such as Maye, Werker & Gerken (2002: 9) and also the work of Kuhl (1991, as cited in Escudero 2005: 71). In this study, it was found that very young infants already start changing perception in the direction of the language that they are acquiring. This indicates that it is likely that the earliest acquisition, which takes place before there is a lexicon, is mainly a frequency-driven mechanism that is based on exemplar learning (Escudero 2005:71). However, in order to develop into more abstract constraint families, there is need for more than frequency of distribution.

Once these distributional categories are formed, the language learning child is expected to give them labels. This leads to the second type of constraints, namely the auditory-to-feature constraints. These constraints are still one-dimensional, but the level of abstraction increases. While in the auditory-to-auditory phase the constraints were concrete values of sounds, the auditory-to-feature constraints show a system. Instead of a duration value of 120 ms, the feature ‘not /long/’ can be found on a constraint. The concrete values from the auditory-to-auditory constraints have been further abstracted to a feature, such as /high/ or not/high/, /front/ or not/front/ or long and not/long/ (Escudero 2005: 46).

As soon as this type of constraint is stored in the lexicon, the lexicon can influence the acquisition process (Boersma, Escudero & Hayes 2003: 1026). When an infant perception system contains abstract categories, initially one-dimensional, such as /high/, /long/, etc, he will no longer rely on probabilities, but will try to figure out what is meant by the speaker (Escudero 2005: 70). This type of learning is called *Lexicon-driven learning*.

When form-meaning pairs are stored in the lexicon, the GLA will try to accomplish optimal perception (Escudero 2005: 75), by lexical as well as distributional processing. The constraints are ranked and re-ranked until optimal perception is (roughly) reached. However, in order to come to adult-like perception, the categories need to become multi-dimensional instead of one-dimensional. It is assumed in the L2LP model that once the one-dimensional categories are stored, other features can be taken into account in order to economize the perception. This leads to the third phase and the third type of constraints.

In the third phase in acquisition a new type of constraint appears, namely the multidimensional auditory-to-feature constraint. This constraint type has integrated different acoustic values. This constraint is able to combine the different features in one constraint. So more than recognizing that a certain value can be long or not-long it can recognize that a sound can be high and non-high and at the same time long and not-long. Compared to the one-dimensional constraint, this type is not more abstract, but it is more complex (Escudero 2005: 47).

The last type of constraint, which also refers to the end stage in the development of the perception grammar, exists of multidimensional auditory-to-segment constraints. These constraints are responsible for the perceptual mapping from auditory input to abstract segments. The multidimensional auditory-to-segment constraints are one step further than the previous type of constraints in that they have included phonetic segments. So instead of recognizing that a certain auditory signal can have a F1 and a F2 value, it recognizes that certain combinations of F1, F2 and duration values lead to fixed interpretations. These constraints thus map auditory input to a fixed vowel (Escudero 2005:48).

The L2LP model assumes that these abstractions are needed for purposes of economical lexical storage (Escudero 2006: 51). The economy lies in the fact that the last type of constraints enables the integration of multiple auditory dimensions in the categorization of sounds as well as the optimal placement of category boundaries. The approach of the L2LP

model may thus be seen as a solution for the head-filling-up-problem as was seen in the ET/DOP approach.

The L2LP model shows very clearly how complex linguistic abstractions can be acquired from the speech of the environment by means of storage of exemplars. By storing the exemplars and inducing abstract information from these exemplars and a gradual increase of the complexity of this abstract information it is shown that language might be learnable and not innate as is assumed by GG.

What is problematic about this model is that it seems to have no clear solution for the problem of speaker variability. If sound categories are based on abstract but absolute categories, it is hard to explain how the voices of children are seemingly perceived just as effortless as adult men and women voices, although they may have very different formant values.

3.3 L2 acquisition

The proposed model for the acquisition of an L2 shows a number of similarities to the one put forward to explain L1 acquisition.

As for L1 learning, the L2 learner is expected to have no knowledge of the language that is being acquired. There is no innate knowledge of grammar assumed in the L2LP model. However, as a consequence of the above mentioned L1 learning, there is the optimally perceiving grammar of the L1 that is continuously interpreting incoming data (Escudero 2005: 89).

However, until today, there is no instance known of L1's and L2's that share the same grammar; every language of the world has a different grammar than every other language of the world. The L2 learner, however, cannot stop his L1 grammar from working. The continuous interpretation of the L2 data by the L1 grammar is thus no advantage for the L2 learner. Consequently, it is the task of the L2 learner to bridge the gap between L1 and L2. Escudero (2005: 89) emphasises the importance of describing the differences between the L1 and the target L2 in order to predict what the initial state of the L2 learner will be.

The L2LP model predicts that the initial state of every L2 learner is represented by an absence of any knowledge of the target L2. This state is called cross-language perception (Escudero 2005: 98) and is seen as the onset of all L2 learning. This means that the first stage in the learning of the target L2 is under strong influence of the linguistic knowledge of the L1.

Specifically, it is proposed that the learner's L1 automatically analyzes all incoming L2 signals.

3.3.1 Full Copying

The L2LP model assumes that the starting point for L2 learning is the copying of the grammar of the L1. Later, the constraints of the L1 can be re-ranked in an effort to achieve optimal perception of the target L2. In the L2LP model, this assumption is called the hypothesis of Full Copying (Escudero 2005: 100). This full copying accounts for the fact that most language users use the categories of their L1 when starting to learn a new language.

If the constraints of the L1 can reach optimal perception of the L2 only by re-ranking, then the above described process contains the main part of the L2 acquisition. In that case, the learning of a L2 is simply the re-ranking of the constraints that were already present in the L1.

But if the situation occurs that the target L2 uses different acoustic dimensions of processing than the L1, a second process is required. Escudero (2005: 102) provides the following example: For a Spanish learner of the English vowel system, it will be necessary to construct constraints for vowel duration. For the categorization of the Spanish vowel system, which consists only five vowels, only F1 and F2 values are needed. In the English vowel system, which consists of many more vowels than the Spanish system, also duration plays a role. Thus, for this learner vowel duration is a non-previously-categorized phonetic feature (Escudero 2005: 102) that he will have to acquire during L2 acquisition, including the constraints that refer to it.

The task of the L2 learner is thus similar to the task of L1 learners. In case of the L1 speaker Spanish who is acquiring English, the L2 learner will have to learn a new category. In order to do this, he will go through the same stages that an L1 learner goes through. First he will learn distributional categories of the new category. The Spanish L2 learner of English will thus store many duration values and rank them by frequency. Subsequently he will store a /long/ and not/long label in the lexicon. From this moment he will integrate the duration values into the existing constraints by lexicon-driven learning.

According to the L2LP model, the L2 learner actually has two tasks while acquiring the target L2. The first task refers to the re-ranking of constraints from the L1, while the second task refers to the creating of new constraints, if new categories are needed.

In a case of new categories, Escudero (2005: 105) emphasizes that the L2LP model assumes that ‘two types of cross-language differences are at play, namely perceptual and representational differences, and that these result in different learning tasks’ (Escudero 2005: 105). In other words, the re-ranking as well as new category forming implies not only that the L2 learner will have to learn to perceive new sounds, but also that he will have to change the existing boundaries of the sounds that were already known to him. The borders between /e/ and /a/, which may superficially seem rather universal categories, can be very different in different languages (Pierrehumbert, 2003: 116 and on). Thus, in an initial state of L2 learning, the perception will thus be non-optimal (Escudero 2005: 109), which can lead to homophony for two phonemes in the L2 that are allophones in this learner’s L1.

3.3.2 The role of the GLA in L2 acquisition

The changing and the creating of new categories are seen as follows. As was often suggested by scientific research (White 2003: 7 and on), the acquisition of L2 shows a lot of similarities with the acquisition of L1. Also in the L2LP model it is assumed that the same mechanisms that enable the human brain to acquire an L1 are available, if necessary, for L2 acquisition. Within the L2LP model, this means that the Gradual Learning Algorithm (GLA) remains available for L2 learning.

For the acquisition of non-previously categorized features, such as duration for learners whose L1 does not have vowel duration categories, the L2 learner is assumed to use the GLA for distributionally-based acquisition of new categories. That is, in the same way as in L1 acquisition, a new category is formed by forming many constraints by distributional learning.

In addition, these newly created constraints are re-ranked in order to accomplish optimal perception through the same mechanism used in the second stage of L1 learning, namely lexicon-driven learning.

3.3.3 End state

For L2 acquisition it is often questioned what the end state of L2 learning is. A very common phenomenon is what is known as fossilization, which refers to the fact that L2 acquisition can stop improving at a level that is not optimal. The L2LP model assumes that fossilization is not universally the end-state of L2 acquisition because a L2 learner is assumed to be able to reach optimal perception of a target L2.

The L2LP model thus rejects the ‘critical period hypothesis’ as is accepted by GG, that claims that post-puberty language learning will always result in imperfect, or non-native-like knowledge of the L2. (Escudero 2005: 115) On the other hand the L2LP model also assumes that the optimal learning of a L2 will not influence a speaker’s knowledge of his or her L1. (Escudero 2005: 116)

The L2LP model accounts for the great difference between L1 and L2 learning by the notion of plasticity. That is, younger learners of a language have higher plasticity. And therefore can acquire a language seemingly quickly. However they will make more mistakes. On the other hand, older learners acquire language slowly because of their previous experience but make much less mistakes than their young counterparts (Escudero 2005: 117). Furthermore, the L2LP model hypothesizes that a L2 learner can reach native-like status. For this to happen, it is proposed that the learner needs to be exposed to a large amount of rich input (Escudero 2005: 118). In addition, this kind of input is expected to outweigh the effects of the above mentioned plasticity.

Finally, the model addresses the question of what will happen to the two grammars that arose from the ‘full copying’ process, if the L2 learner can reach optimal perception in the target L2? Some evidence has been put forward that suggests that there is no complete separation of grammars for bilingual language users; in fact some experiments have indicated one single perception grammar instead of two (as cited in Escudero 2005: 119). In the L2LP model it is assumed that there is an activation continuum between the languages that a bilingual speaker knows. Following Grosjean’s (2001, as cited in Escudero 2005: 119) hypothesis of language modes, the L2LP assumes a Language Mode Continuum. This hypothesis states that the different languages of a bilingual speaker can be ‘more or less’ activated during language use. On the extreme’s of the continuum only one language is activated, in the middle of the continuum the states in between these extremes are represented (Escudero 2005: 119). As a consequence of the Full Copying hypothesis the L2LP model thus assumes two separate grammars for bilinguals. However, due to the Language Mode Continuum Hypothesis more than one language can be activated at a time. (Escudero 2005: 120)

3.4 Summary and discussion

The L2LP model assumes L1 as well as L2 learnable for the human brain without any inborn principles. The L2LP model thus rejects the UG hypothesis as well as the critical period

hypothesis that is assumed in GG. In Chapter 4 it will be discussed that the critical period hypothesis can also be rejected without rejecting the UG hypothesis.

In the L2LP model, L1 and, if necessary, L2 acquisition are instantiated by the GLA, which is a general learning algorithm for all types of learning, i.e. it is not exclusive for linguistic acquisition. This idea of the existence of a general learning mechanism which enables language acquisition is shared by the ET and DOP frameworks. In addition, both the L2LP and the ET/DOP approaches assume an important role for exemplar learning in linguistic acquisition.

As a consequence of the assumed non-linguistic nature of the GLA, the L2LP model partly rejects the AUTOGRAM hypothesis which claims that language is completely independent of other cognitive capacities. Partly, because the L2LP model does assume a language faculty, as is also implied by the AUTOGRAM hypothesis, but for L2LP this assumption needs further precision. The L2LP model may possibly not assume that a language faculty is innate, although it is not explicit about this matter, but it does assume a separate processing for linguistic and non-linguistic data, as is assumed by AUTOGRAM.

Summarizing, AUTOGRAM is thus accepted and rejected. The L2LP model accepts that there is separate processing for linguistic and non-linguistic data; the L2LP rejects that there is a linguistic learning mechanism, but assumes that the acquisition of language is instantiated by a general learning mechanism of the human mind.

The L2LP model departs from ET and DOP in that the L2LP model assumes that abstract knowledge is an important element of linguistic processing. In the L2LP model exemplars play their most important role in linguistic acquisition. However, as a consequence of the acquisition model there are still many concrete exemplar-like constraints present in the L2LP model. Exemplar-like constraints are still an important unit of processing in the perception grammar of an adult language user. The output of this perception grammar consists of abstract categories. The abstractions are in a way a probabilistic clustering of constraints with an exemplar nature. There is thus a combination of concrete and abstract constraints in this model; part of the constraints is concrete, since they refer to every possible value but at the same time they also refer to finite abstract categories.

As for the GG framework, the L2LP model still poses a problem for linguistic change. The L2LP model makes use of abstractions as well as exemplars; and since there has been storage

of exemplars in early linguistic experience and since the distributions in the mechanism can be influenced by probabilities, there is more opportunity for linguistic change to take place than in GG. To be precise, during linguistic experience there can be re-ranking of constraints in case of change in production in case of a change in the input. However, since there is only storing of exemplars in the earliest language acquisition, there is no explanation for linguistic change in the hypothetical case of units that were *not* perceived during the earliest acquisition. Consequently, if an example of linguistic change sets off after the abstractions of a language user are fixed, it would be impossible to acquire this change. Intuitively it is the case that the human linguistic system is more accessible for change than only the sounds that a person may have stored during the earliest language acquisition.

The L2LP model remains implicit about the possibility of change of the knowledge of the L1. However, its view on L2 learning suggests that the GLA remains available throughout life. This might give an answer to the observation that a person's knowledge of language is able to change over time. In the first place, the ranking of the constraints is probabilistic in nature, so a change in input could lead to a re-ranking of constraints. However, if the GLA stays active during linguistic experience, this may be problematic for the abstractions that are assumed in the L2LP model. If it is the task of the GLA to learn new categories that occur in the linguistic input, this would mean that for every new form of input, new exemplars are stored; this would lead to a continuous change of the used abstractions. However, in the L2LP model, the multi-dimensional auditory-to-segment constraints are expected to be rather stable and not changing continuously as is expected by ET and DOP.

As a consequence of the probabilistic nature of the ranking of the constraints in the L2LP model, this model thus rejects the AUTOKNOW hypothesis from GG, which claims that knowledge of language is independent of language use. The L2LP model assumes a strong correlation between language experience and knowledge of language. Consequently, the L2LP model rejects the AUTOSYN hypothesis that claims that grammatical rules are independent of frequency.

Most importantly, the L2LP model gives an interesting viewpoint on the matter of the 'head-filling-up' problem that was seen before in ET and DOP. In theories as such, a person's complete linguistic experience is stored, which seems very inefficient. The L2LP model suggests a role for exemplars in the earliest acquisition, in order to acquire abstract knowledge. At the same time the model gives an interesting view on how the linguistic

competence may make use of exemplar as well as abstraction-based processing. This seems an interesting viewpoint for the discussion in this study, and will be more elaborately addressed in the discussion in Chapter 5.

Chapter 4.

Second Language Acquisition and Universal Grammar (Lydia White 1989).

4.0 Introduction

Lydia White (1989) is one of the pioneers in second language (L2) research on Universal Grammar (UG). This chapter will be devoted to the theoretical consequences of White's assumption which states that UG is available for L2 learning.

White's assumption of the availability of UG for L2 learning is especially interesting for the current study because White rejects the 'critical period' hypothesis, as do Exemplar Theory (ET), Data-Oriented Parsing (DOP) and the Second Language Linguistic Perception (L2LP) model. As opposed to these three theories White (1989, 2000, 2003) does not regard language as learnable, but instead assumes that it is innate in the human brain as a Universal Grammar. However, as opposed to Generative Grammar (GG), she does not regard these innate principles and parameters as only present for L1 learning, but instead also for the acquisition of an L2. In this chapter it will be pointed out which arguments White uses to support these assumptions.

It is important to mention that because White (1989, 2000, 2003) only departs from Chomsky regarding L2 acquisition, her ideas on L1 acquisition will not be discussed in this chapter as they are the same as the ones presented in chapter 1.

White's (1989: 37) most important observation is that Plato's problem, or what she calls 'the logical problem of language acquisition', also pertains second language (L2) acquisition. In other words, in L2 acquisition the output of a L2 learner also goes beyond the input that the he or she is exposed to. According to White (1989, 2000, 2003), this observation indicates that in L2 learning there is also a triggering of universal syntactic rules from the UG module, as is proposed for L1 learning by Generative Grammar (GG). In order to make the presentation of White's proposal more clear, some terms that are explained in Chapter 1 will be briefly repeated below.

Plato's problem refers to two of Chomsky's observations with regards to infant language acquisition. Firstly, the output of the infant goes far beyond the input that he or she receives, because the speed of acquisition that can be observed goes beyond what can be accounted for from the input that he or she is exposed to. Secondly, this input that a language learning infant is exposed to, is an imperfect reflection of the linguistic competence of the speakers. That is,

linguistic performance is full of flaws and ungrammaticalities. These two observations, among others, led Chomsky to believe to the belief that language is innate. According to him, the human mind contains a language faculty (LF) that is responsible for linguistic acquisition and later in life for linguistic processing. This LF is assumed to be independent of other cognitive capacities.

In the LF, there is a subpart that contains the universal grammar (UG) that consists of a set of so-called principles and parameters, which describe the syntactic rules of every possible language in the world. Principles define what the architecture of different languages might look like, and parameters define the variety that is found in these different languages. An example of a principle that is expected to be found in the UG is the notion of recursivity; recursivity is thus assumed a highly universal principle within the GG framework. An example of a parameter that is assumed by GG to be present in UG is the possibility that a language may drop its subject or not, i.e. the [null-subject] parameter.

Principles and parameters as these are thus assumed to be present in the mind of an L1 learner. By closely paying attention to the language that is spoken around him, the L1 learner triggers the right principles and parameters for the language that he is acquiring. UG is thus assumed to help an infant acquire a language. Since all this syntactic knowledge is built-in, the acquisition of language is primarily the triggering of the right rules. Thus, the most important part of acquisition is setting hypotheses in order to find out which language the infant is acquiring. These built-in principles are expected to make the acquisition process simpler than when a child has to 'start from scratch'.

However, GG assumes that the UG module is only available for L1 learning. Chomsky thus rejects the possibility that UG is available for L2 acquisition. The main evidence for this conviction is the observation that most L2 learners will not reach as high a proficiency for a second language as for their first language. Chomsky concludes from this observation that the learning of L2 is subject to a more general learning ability or talent that a person may have or may lack.

In order to learn a language fluently, Chomsky assumes that a language must be learnt before the end of the so-called 'critical period'. The cut off point of this period is subject to change, but generally it is believed to be puberty.

White (1989: 48) rejects this critical period hypothesis and assumes instead that the innate language principles of the UG are also available for L2 learning. In the following paragraphs, it is explained what her postulations on this matter are.

4.1 Similarities and differences between L1 and L2 learning

The most important similarity between L1 and L2 acquisition that White (1989: 35) puts forward is that the logical problem of language acquisition also applies to L2 learning.

Before explaining why she maintains this position, it is important to take into consideration that White (1989: 35) does regard the linguistic competence as abstract. White considers the interlanguage grammar (ILG)³ in the first place to be a mental grammar that exists of an abstract system of principles and rules (White 1989: 35). She emphasizes, however, that the internal structures of the L1 and L2 do not necessarily have to be similar (White 1989: 35). White does assume that in the same way as for an L1 learner, an L2 learner's main linguistic process also involves the formation of an abstract linguistic competence that describes the linguistic competence of this speaker (White 1989: 36). As in the Generative Grammar (GG) paradigm, White thus regards language as a closed system of abstract syntactic rules.

Considering this system of abstract syntactic rules that the ILG consists of, almost automatically Plato's problem appears⁴. When a language learner makes a generalization this automatically goes beyond the input that he or she is exposed to (White 1989, 2000, 2003). The logical problem of language acquisition thus follows naturally from the assumption that there is a linguistic competence which consists of abstract knowledge of language.

Along with this similarity, there are also differences between L1 and L2 learners (White 1989: 41-45 and 175-177). The most striking difference, according to White, is related to the degree of success. That is, L1 learners seem to be more successful in the acquisition of a language than L2 learners because the latter have great difficulty in acquiring some elements of language that seem to come naturally to L1 learners, such as phonology and inflectional morphology (White 1989: 42). White (1989: 175) regards the seemingly unsuccessful acquisition of L2 learners not necessarily as an indication that UG is unavailable for L2

³ White (1989, 2000, 2003) uses the term interlanguage grammar to refer to the grammar of a second language. This term is adopted in this study.

⁴ This idea possibly refers to the ideas of Karl Popper (1902-1994), who is regarded as one of the founders of the current philosophy of science that is maintained within the field of humanities. Popper (as cited in Leezenberg & de Vries, 2001: 67) elaborately discussed the problem that a generalization can never be tested. A generalization always refers to an infinite amount of observations while a human being can only make a finite amount of observations. The only thing that lies within the human capacity is thus to falsify a theory. According to Popper there is thus no way to verify a generalization.

This problem also shows up in Chomsky's linguistic competence. If the competence exists of abstract generalization it will always go far beyond the input, since it refers to an infinite amount of linguistic utterances, while a language user will only make a finite amount of utterances.

learning. On the other hand, she considers the observation that L2 learners do not produce forms that violate principles of UG as evidence that L2 learning is constrained by UG (White 1989: 175). However there are two things that can be brought against these observations. White seems surprised over the fact that phonology and inflectional morphology seem to be the most difficult part of L2 acquisition. From an exemplar perspective this is not surprising at all for the following reason. Phonological and inflectional morphological units are the smallest meaningful units of language. And in a model that assumes storage of the complete linguistic experience, it follows logically that these linguistic units are represented in the highest numbers. In case of learning a new language, it will thus be the hardest to influence the online formation of categories for these categories that are represented by enormous amounts of data.

The second thing that can be brought against White here, is that it is rather questionable what a 'violation of UG principles and parameters' may mean. There seems to be danger of a cycle here. The principles that are assumed present in the UG are based on what is observed universal in the languages of the world; this observations are based on the research on what kind of structures are found in the languages of the world. In a theory that describes the knowledge that we have on what structures are found in languages of the world, it cannot be argued that there are no structures observed that are not found in the languages of the world.

A second difference between L1 and L2 acquisition that White puts forward is that an L2 learner knows more than one language, whereas a L1 learner knows only one (White 1989: 43). White regards it as a possibility that a language user has two grammars that are both constrained by UG principles and parameters (White 1989: 175).

The third difference between L1 and L2 learners is that L2 learners are often observed to reach an end state of which the level of proficiency is lower than the proficiency of an L1 learner. This observation is referred to as fossilization (White 1989: 43). White regards fossilization as a failure to reset parameters from the UG (1989: 176).

The fourth difference between L1 and L2 learning that is mentioned by White (1989: 43) is the input that the learner is exposed to, because it is assumed to be different for L2 learners than for L1 learners. White (1989: 44) regards the input for L1 learning as more natural than the input for L2 learning mainly because the latter often takes place in a classroom environment, which makes the input unnatural for L2 acquisition. The input of an L1 learner is regarded as natural. The child is exposed to the speech that is spoken to him in a child-

directed way, which is referred to as 'motherese'. However, White, along with many other researchers on L2 acquisition, seems to overlook the fact that the type of language that is spoken to an L2 learner shows many similarities to the language that is spoken to young children. Even when an L2 learner does not explicitly say that he is learning a language, as soon as the speakers of this language detect an accent or a lower proficiency than their own, they will automatically use more simple grammar, more transparent constructions and raise their intonation and volume. It can thus be argued that motherese is spoken to L1 as well as L2 learners.

A matter that is related to the naturalness of input is the presence of negative evidence. Negative evidence is the term for feedback that a certain utterance is wrong or ungrammatical. White points out that the presence of negative evidence is shown to be ineffective for L1 learning (1989: 176); children who get feedback that a sentence is ungrammatical will not improve by this instance of negative evidence. For L2 learners, however, this negative evidence is actually suggested to be of positive influence for L2 acquisition. Scha (1990), as was mentioned in Chapter 2, accounts for this observation as follows. The grammar of a young infant is expected to be of pragmatic and semantic nature, while there is a higher level of abstraction for adult speakers of a language. It is thus too difficult for a child to understand meta-linguistic ideas. Negative evidence is one quality of meta-linguistic thought. Scha will thus expect that it is for this reason that negative evidence has no influence for L1 learning, while it has for L2 learning.

The last difference between L1 and L2 acquisition that White mentions is the difference of age between L1 and L2 learners. She states that most L2 learners are older than L1 learners, although the effect of this age difference is debatable (White 1989:44) and difficult to control for in an experiment (White 1989: 177). There are numerous consequences of age differences. With age memory is believed to deteriorate, which may, especially within the ET and DOP frameworks, decrease the speed of acquisition. At the same time, as was seen in the L2LP model, the young language user has higher plasticity, which means that he is more likely to make mistakes but at the same time he will acquire faster. But age may also be an advantage for acquisition, adults are better conceptual thinkers, which may be an advantage for learning explicit grammatical rules.

4.2 Availability of UG

White (1989: 48-49) assumes two possibilities as to the availability of UG for second language (L2) learning. The UG is either available for L2 learning or not. However, both of these options may be interpreted in a number of ways. If the UG module is assumed available for L2 learning, this assumption may, on the one hand imply that it works exactly as it does for L1 learning, or on the other hand it may work differently (White 1989: 48). Alternatively, UG may also be completely unavailable for L2 learning, however this is not regarded an option for White (White 1989: 48). White considers unavailability of UG as follows: the UG may not be available but the principles and parameters that are present in the grammar of the L1 are available and can thus be reset.

The most important function of UG, emphasizes White (2003: 1), is describing what a *possible* grammar is. According to her (White 2003: 153) it needs great emphasis that it is a misconception that the function of the UG is that of acquiring language. White states that the even if the UG module may be of help to acquisition, the UG hypothesis is only a model of representation and not a model of development (White 2003: 152). The UG is thus *used* in language acquisition, while it is not the main mechanism that acquires language.

4.2.1 Wild grammars

Next to the presumed misconception about the function of the UG module, White also emphasises what the result would be if the UG module were unavailable for L2 learning. She argues that the only result of the (partial) unavailability of UG for L2 learning would be that the grammar of an L2 learner is fundamentally different in structure from a grammar of an L1 learner of the same language. Grammars that are not developed along the principles and parameters of the UG module, are called ‘wild grammars’ by White (2000: 148). According to White (1989, 2000, 2003), it can be doubted if there are L2 grammars that are ‘wild grammars’, especially since L2 learners, just as L1 learners, do not seem to violate principles from UG. In other words, L2 learners do not seem to produce utterances that are impossible in the languages of the world.

In this part of the discussion it is important to recall from Chapter 1 that it is expected by GG that only few principles and parameters need testing before the infant decides which language it is trying to acquire. In the case of unavailability of the UG module for L2 learning, it is thus expected that the L2 learner will have to acquire some features of his L2 from UG definitions, while others from a more general learning mechanism. As was mentioned above, grammars

that develop from a general learning mechanism that is not instantiated by the UG module, are thus wild grammars. This is interesting for this study, since we have seen many proposals for grammars of L1s that are not constrained by principles of the UG module, simply because these theories did not assume the innate language acquisition module that is proposed by GG. According to White (2000: 248 and on), a wild grammar can never be as accurate and as precise as a grammar that has developed while setting principles and parameters from the UG module. It is clear that this will be highly debated by every other theory in this study. Both ET and DOP and L2LP will argue that it is actually possible to learn a language without use of principles and parameters that are assumed by GG and L2UG to be present the UG module.

4.2.2 Critical Period

White (2000: 145) takes no position on whether there is a critical period of language acquisition or not. She brings forward evidence in favour of a critical period and evidence against it. According to White (2000: 146) it is not very important to believe in a critical period hypothesis. Moreover, White points out that even if there were a critical period after which the UG module is no longer available, it can still be argued that some knowledge from the UG module is available afterwards. As was mentioned above, according to White the main task of the UG is not necessarily the acquisition of language but the description of what a possible human language may look like. Thus, even if the UG module were unavailable for L2 learning, there is still some knowledge available in the grammar of the L1 that originated in the UG module. White's (2003: 151) line of reasoning is that the L2 is also a possible language, so it can be expected that principles and parameters from the L1 may also be of help for L2 acquisition.

Consequently, when following White's ideas, the availability of UG as principles and parameters from the L1, may also be of negative influence to L2 learning. Even a layman knows that the knowledge that a person has from his L1, may slow the process of L2 learning. White's availability of the UG, either or not from the L1 grammar, will thus not necessarily improve the learning of an L2. Moreover, it seems that this question is rather a principality matter to her. The availability of UG may only come down to the fact that people seem to know what language is. This knowledge however, may even have no influence at all at the learning of an L2, according to White. White's point of view is that people can learn an L2 and at the same time people know that there is such a thing as language. And even if they may have forgotten that there are also other possible languages than their L1, they still know what is possible in their own language. This viewpoint however is not of great interest to the

discussion in this study, since the topic of the current discussion is language acquisition and not the content of the UG module. Therefore, her arguments on this matter will not be discussed here.

4.2.3 Full and partial access and transfer

White (1989, 2000, 2003) repeats over and over again that it remains unclear whether there is full or partial access to the UG module, as well as it is unclear if there is full or partial transfer of the L1 grammar. White (2000: 139) emphasizes on the difficulty to find evidence for either one of the possible approaches. The field of investigation on this matter deals with numerous methodological problems.

In the first place it is very hard to find evidence of what the linguistic competence of a speaker is, when a researcher has only access this speaker's performance. This problem of course applies to all linguistic research in the field of GG, but according to White (2000: 139) it is especially problematic for L2 acquisition because it is impossible to decide what constitutes the knowledge of the L1 and what can be regarded as knowledge of L2.

At the same time it is problematic to decide what can count as evidence. The absence of evidence for a certain construction does not necessarily mean that the speaker lacks the grammatical competence to produce this utterance (White 2000: 139). A related problem is that when a certain construction is actually produced albeit with mistakes, does this count as evidence that a parameter has been reset? Subsequently, the problem emerges of how many appearances of a certain construction are sufficient as evidence that this construction is mastered.

Moreover, White (1989: 54) admits that it is difficult to find evidence for the accessibility of UG for L2 and she states that the only way to test the availability of UG is to find an example of L2 acquisition where an L2 learner acquired a principle or parameter that was not exemplified in his or her L1 grammar (White 1989: 54). Fortunately, there appears to be some evidence that this kind of principle and parameter resetting is taking place in L2 acquisition. The Null Subject Parameter is one of the first parameters proposed by the GG paradigm (Chomsky 1981, as cited in White 1989: 84) and it is provided by White as an example of parameter setting in L2 learning (white 1989: 84).

The Null Subject Parameter refers to the fact that some languages need a subject for every sentence while other languages do not always need a subject. Generally, in languages that have a paradigm of agreement marking for every pronoun on the verb, this agreement marking is enough information to account for the subject of the sentence; the pronoun can

thus be dropped. Consequently, the languages that allow for this possibility are also called prodrop languages. An example of such languages is Spanish, as demonstrated in (1) (taken from White 1989:85).

(1)

Anda muy ocupada
Is very busy
She is very busy.

White explains that L2 learners of Spanish are able to reset this parameter, even when it is not present in their L1 grammar. The author emphasizes, however, that it is not obligatory to drop pronouns in Spanish because speakers of Spanish have the choice to either drop the pronoun or not depending on discourse rules. At the same time it turns out that the L2 learners who on the one hand did master the Null Subject Parameter did not necessarily acquire the right discourse rules of when it is appropriate to drop the pronoun. However, according to White (1980: 86), this is not indicative of the syntactic knowledge of the L2 learner, rather it is a matter of performance principles that are unimportant for the description of the linguistic competence of the L2 learner.

There is a lot that can be argued against this example of parameter 'resetting'. Firstly and most importantly, even though White states that it is a matter of performance, if it is the case that the L2 learner has not acquired the correct knowledge about when it is appropriate to apply this rule, it seems that the L2 learner has not completely acquired it. The learner may have acquired the syntactic knowledge that is needed in order to apply the Null-Subject rule, however, as he did not regard the correct discourse rules as to when it is appropriate to apply the rule, he will not reach a native-like proficiency of this rule, and it can thus be questioned whether it is actually acquired. In the second place the possible dropping of the Subject does not necessarily indicate parameter (re)setting. One of the advantages that an L2 learner has before an L1 learner, as is mentioned in the L2LP model, is that he is often an adult and is thus able to understand certain concepts which may actually facilitate the acquisition of an L2. The Null-Subject rule is a nice example of a grammatical rule that may easily be explained to or understood by the L2 learner because of his ability to see through this kind of structures, which is an ability that young infants may lack.

4.2.4 From initial to final state

According to White (2000: 130 and on), the process of L2 acquisition is seen as follows.

There is an initial stage, in which it can be argued what information is available to the L2 learner. From this initial state the learner develops into the end state of L2 learning. This is of course a too much of a simplified explanation of White's viewpoints, however it does state that there are three states that are assumed by White: the initial state, the developmental state and the end state.

As was seen above it is highly debatable what the initial state of L2 learning looks like. Is there a transfer of L1 grammar or not, is there availability of UG principles and parameters or not?

At the same time, also the exact process of development is uncertain. White claims that there is a need for a theory of development next to the theory of representation, as she calls the UG hypothesis. According to her, a theory of development of UG principles should ideally not only account for language acquisition but also for linguistic change (White 2003: 152). This is very interesting, since she departs from Chomsky on this topic. Chomsky (as we have seen in chap 1) finds the exact description of the language acquisition process unimportant to the study of the architecture of syntax in the human brain. Also the field of linguistic change is unimportant to him as it lies in the realm of performance. White, however, states that there is actually a need for a theory of development that accounts for the different stages of language acquisition and must ideally also account for language change (White 2003: 152). However, unfortunately she does not formulate this theory of development herself.

As was mentioned before, White points out that there are a number of possible views on the transfer of the L1 grammar in the acquisition of an L2. At the same time, as was discussed above, there are also different possibilities of accessibility to the content of the UG module. According to White (2000: 133) these different possibilities lead to five possible approaches to the initial state of L2 learning, which will not be addressed one by one in this chapter. The main differences between these approaches lies in the fact that they assume full or partial access to the UG module and full, partial or no transfer of the L1 grammar in the initial state of the L2 learner.

Approaches that assume full access to the UG module expect that there is a direct interaction of linguistic data and UG. Approaches that assume no/partial access to the UG module expect an indirect interaction between linguistic data and UG, namely through the grammar of the L1.

When a full transfer of the L1 grammar is assumed, this means that there is great interference of the grammar in the L1 on the linguistic data of the L2. If there is no/partial transfer it is not expected that the grammar of the L1 has much influence on the acquisition of a L2.

White (1989, 2000, 2003) does not choose one approach that she finds most likely. Instead she emphasizes that all possible approaches share that they regard UG as available for L2 learning, either by assuming direct access to the UG module, or indirect access to the UG module through L1 grammar. She does mention that she finds the approach that assumes that there is full transfer of the L1 grammar and at the same time full access to the UG module as most logical (White 2000: 149), unfortunately she does not elaborate on why she thinks this is so. This full access/full transfer approach, however, does seem somewhat similar to the L2LP model. In the L2LP model it is also assumed that there is full transfer of the grammar of the L1, at the same time there is also the assumption that there is full access to the acquisition module that is used for L1 acquisition. However, within the L2LP model it is not assumed that this is the UG module, but that it is a general learning algorithm of the human mind.

When studying the end state of the process of L2 acquisition, the question needs to be asked as to what the L2 learner has achieved. In this respect, White starts by stating that ‘we have relatively little idea of what the steady state grammar of an L2 learner looks like’ (White 2000:145). The main difference between an L2 and an L1 learner of a language, is that there is greater variety between the grammars of different L2 learners than between the grammars of different L1 learners. Thus, as opposed to L1 learners, whose grammars are assumed to be very similar, the L2 learners’ grammars may show greater diversity; the reason for this diversity lies especially in the fact that different L2 learners seem to fossilize at different stages of language learning. Consequently, White does expect greater variety among L2 grammars than L1 grammars (White 2000: 146).

White comes up with a rather surprising conclusion as to whether there is full or partial access to UG. She states: “[all] This [evidence] suggests that we should avoid thinking in terms of a dichotomy.” (White 2000: 149). By this dichotomy she means the full access and the partial access to UG assumptions. She thus states that there is no actual difference between full or partial access to the UG module. Moreover, she concludes that ILGs ‘can be pushed in new

directions, whether the more abstract underlying principles come from UG, the L1 or both' (White 2000: 149).

Comparing this view to the theory of GG as presented in chapter 1, it can be doubted if Chomsky would agree with White on this idea. The L1 grammar, although acquired by means of the principles and parameters of UG, is language specific and thus influenced by linguistic experience, or performance. The content of the UG module, however, is universal and thus completely independent of linguistic experience. The rejection of the dichotomy of L1 grammar and UG principles is thus a rejection of the AUTOKNOW hypothesis that states that knowledge of language is independent of language use.

4.3 Summary and discussion

The availability of UG for L2 learning as proposed by L2UG (White 1989, 2000, 2003) is perhaps the most cautiously formulated model that is discussed in the present study.

White proposes that UG might be available for L2 learning and observes that there are many differences between L1 and L2 acquisition, such as age, the presence of negative evidence, and the different final states for L2 learning. White expects that there is greater variety between the grammars of second languages than there is variety between L1 grammars. Whether these differences are due to the unavailability of the UG module for L2 learning or the transfer of the L1 grammar is not ruled out by White. She regards both possibilities as evidence that there is at least some knowledge from the UG available. In the case of full access, the availability is most clear; all knowledge present in the UG is then expected to interact directly with the linguistic data that the L2 learner is exposed to. In case of no access of the UG module, White expects that there is still some UG knowledge available that is transferred through the grammar of the L1. In both cases, however, some principles and parameters that are present in the L1 are transferred to the L2 grammar. In the case of full or partial transfer of the L1 grammar, the knowledge of the UG is expected to interact indirectly with the linguistic data exposed to the L2 learner.

White emphasizes, however, that UG is a theory of representation and not a theory of development. UG, according to White, is a description of linguistic knowledge in the human brain that represents the possibilities of natural language. Consequently White does not regard UG as a theory of language acquisition. This viewpoint makes that her insights on the matter of availability of UG for L2 learning do not add much to the discussion in this study.

Chapter 5

Discussion

5.0 Introduction

As an introduction to the discussion held in this chapter, it was briefly repeated below what the main observations of the theories presented in the previous chapters were.

In Chapter 1, it was discussed that Generative Grammar (GG, Chomsky 1957) regards language acquisition as a process that consists mainly of acquiring syntactic rules and lexical entries. Moreover, in the GG paradigm language is seen as a closed system of highly abstract syntactic rules. GG sees evidence for the existence of grammatical rules and abstract processing, in two main findings. Firstly the arbitrary nature of linguistic patterns and their independence from semantics and frequency. Secondly in certain mistakes that children make in language acquisition, such as the overgeneralization of regular verb inflections on irregular verbs.

As this highly abstract system is regarded as too complex to be learnt in the short while that children seem to acquire their mother tongue, GG expects that children are unable to acquire language by means of induction. Thus, GG assumes that this complex system of syntactic rules is innate to the human mind in the form of a universal grammar (UG) which consists of principles and parameters. According to GG, L1 acquisition results from the triggering of the right syntactical rules from the UG module in the language faculty of the human brain. It is claimed that UG is not available for L2 learning and therefore for this process a more general learning mechanism is required.

Chapter 2 was devoted to Exemplar Theory (ET, Johnson 1997) and Data-Oriented Parsing (DOP, Scha 1990, 1992), who reject almost every assumption of GG, such as the mental representation of grammatical generalizations, as well as the innateness of linguistic structures and the independence of frequency. Instead, ET and DOP assume that the complete linguistic experience of a language user is stored in the speaker's mind, i.e., they regard language as a non-abstract conglomerate of stored exemplars. The processing of language is thus 'simply' a matching process that tries to compare new data to old stored data. In this approach, there is no abstraction or categorization assumed.

ET and DOP find evidence for this approach in two pieces of evidence. Firstly, the fact that the human memory seems very extensive, for linguistic as well as non-linguistic data which

can be observed in the great and precise memory for linguistic instances that people seem to have Secondly, the strong frequency effects on linguistic processing.

Therefore, L1 and L2 the acquisition are regarded as storage processes. For L1 acquisition, the increasing of complexity of grammatical utterances is expected to be in straight correlation with the language instances that the learner is exposed to. However, this is more difficult for an L2 learner, since the great amount of stored data can be disadvantageous for the acquisition process, as opposed to the 'blank mind' for the L1 learner.

Chapter 3 described Second Language Linguistic Processing (L2LP) (Escudero 2006); a theory that rejects both possibilities. L2LP recognises GG's point of view that the language system is most efficient when it consists of abstract generalizations. In the L2LP model, these abstractions develop during acquisition from concrete language data.

L2LP's main evidence for the exemplar learning approach for linguistic acquisition is that, especially during acquisition, frequency effects are found. L2LP's evidence for abstract processing is found in the adjustment of boundaries between abstract representations, which happens by means of abstract lexical representations.

In contradiction to GG, the L2LP model regards language as learnable and not as innate and proposes that an L1 is learnt by means of the storage of exemplars. That is, concrete linguistic data are stored until enough information is available to turn this items into abstract representations. From that moment on, there is no more storage of exemplars.

In the case of L2 learning, there is already abundant abstract data available, which needs to be modified until the optimal comprehension of the L2 is achieved. If there is need for the learning of new L2 abstract knowledge, the L2LP model proposes that the same exemplar learning used for L1 learning takes place in L2 acquisition.

In the processing of language in the steady state, L2LP assumes, in the same way a GG does, that processing by means of abstractions is more efficient than processing by means of concrete language data.

Chapter 4 is devoted to Second Language and Universal Grammar (L2UG, White 2003). This approach rejects some of the ideas from every above mentioned theory. Thus, it agrees with GG on L1 acquisition. However, it assumes that this process also takes place in L2 learning. The L2UG approach assumes that the UG module is also available for L2 learning, and even if it is not, that there is still knowledge from the UG module available in the grammar of the

L1. L2UG finds evidence for this believe in the fact that for certain parameters, such as the Null-Subject parameter, it seems that they can be reset in the acquisition of L2.

What is most striking about these four different theories is that it seems that their views on exemplars and abstractions do not necessarily exclude each other. As was most clearly seen in the L2LP model, the existence of abstractions does not rule out the storage of exemplars. However, in the L2LP model there is only small role for exemplars in the processing of adult language; the exemplars are there as a result of the acquisition process and are not encoded as such but as part of the grammatical constraints which combine exemplars and abstract categories.

Below, I entertain the possibility that there might be constant storage of exemplar as well as abstractions in linguistic processing.

5.1 Concepts and Categories

It cannot be refuted that linguistic knowledge is very hard to access directly. In order to discuss what the role of exemplars and abstractions may be in the processing of linguistic concepts, it may be useful what knowledge people have of non-linguistic concepts and if this knowledge seems abstract or exemplar.

When looking at the knowledge that we have of non-linguistic concepts and categories, it seems that we have abstract knowledge as well as exemplars that we can recall. For instance, lets consider the concept of a 'bird'. Every person knows a set of abstract properties of a bird as well as many instances of birds that they have seen in his life.

Together with the fact that people seem to have abstract as well as concrete knowledge of concepts, it also seems that different types of categories have different levels of abstraction in our memory.

For certain concepts it seems that more abstract information is available, while for others there is only concrete information. For example, it appears that people find it hard to define abstract properties of 'yellow' (they may say something like 'sunshiny', or 'light'), while it is easy for them to give a great number of examples of 'yellow things'(lemons, canaries, their favourite t-shirt).

It is often argued, however, that the fact that people cannot describe abstract concepts doesn't not say that they do not have them at all. When defending this viewpoint it is often argued with regard to grammatical rules, that it is only difficult to explain even though there are

cognitive representations of these rules or concepts. The ET/DOP approaches, however, indicated that theoretically there is no need for mental representations of abstractions to be able to account for linguistic behaviour, which is seen as evidence why it is so hard for people to make grammatical knowledge explicit; it is simply not stored and thus not retrievable.

The opposite is also conceivable, namely that there must also be concepts that are easier to define than to give examples of. For instance, most people will find it easy to give abstract properties of the concept of 'democracy', while they may find it more difficult to give examples of democracy. It is clear that this also has to do with the level of abstraction of the item itself. Less abstract words can be defined by concrete definitions and highly abstract words may need different concepts in order to define them. However, it also seems that both the words 'yellow' and 'democracy' are highly abstract items, which require concepts in their definition, but still it seems that they are stored with different amounts of concrete and exemplar knowledge. This observation may indicate that there is abstract as well as exemplar storage of concepts.

Yet, there is also another observation that may be of importance for the representation of concepts in the human brain, namely the amount of overlap of knowledge of categories. The stability of concepts and categories appears to be different. That is, there are concepts that seem to have great overlap within a community, or even universally, such as colour terms, practical terms such as 'water', 'food' or 'father', although it may be expected that even concepts as such are not completely universal in nature. On the other hand, there are concepts that are represented very differently in different people's minds, such as 'beautiful' or 'good'. It can be argued that for these different sorts of concepts there may be different degrees of abstraction.

The question remains what kind of concepts language is defined by. Firstly, it may be that linguistic concepts are the type of concepts that are hard to define abstractly while it may be easy to give examples of them. Secondly, language exists of concepts of which it can be expected that there is great overlap among different speakers.

However, it must also be noted that people do have abstract knowledge of their language because if someone is asked what a 'noun' is, they will probably react by giving a semantic definition, such as suggesting that it is something someone could touch. They may even have

a more meta-linguistic definition that says that a noun is a word that can be preceded by the article 'the'.

With regard to the amount of overlap, it is to be expected that the overlap of linguistic knowledge between different speakers can be disputed. For instance, it seems that differences of age, gender or social class often result in different opinions on what the proper pronunciation of a word may be, or what a grammatical structure may look like. However, it seems that these groups seem to be perfectly able to understand each other, even when they do not share the exact same knowledge.

5.1.2 Exemplars and abstractions in cognitive psychology

In cognitive psychology a great number of studies are devoted to the processing and the development of concepts and categories in the human mind. It turns out that, as in linguistics, also in psychology the distinction abstract versus concrete is a fiercely debated matter. Ross & Makin (1999) wrote an interesting paper in which they summarize the debate on exemplar and abstract processing for the cognitive representation of concepts and categories.

In cognitive psychology, the two possible approaches to the representation of concepts and categories are called the exemplar and the prototypical approach.

In an exemplar approach to category representation, it is expected that the knowledge of a category is actually the knowledge of the different instances of this category. A prototype approach, on the other hand, assumes abstract knowledge of categories (Ross & Makin 1999: 205).

A prototype or abstract definition of a bird would be that it lays eggs, it can fly or swim, that it has a beak and feathers. An exemplar definition would be a collection of images of different birds that a person has seen in his life. When looking at these two definitions it can be argued that the human mind is able to do both, for we seem to have memory for instances as well as abstract knowledge about birds.

According to Ross & Makin (1999: 231) it is unlikely that only one of the two types of processing is used for conceptual thinking, because both the abstract and the exemplar approaches have shortcomings.

The prototype view on categorization is insensitive for what Ross & Makin call ‘within-category correlation’. In other words, when regarding the bird example, a parrot is always classified as a bird; it can thus not be explained that there is variation within a category. Consequently, in a prototype approach there is a need for new prototypes within a prototype for further classification within one concept. If this were the case, it meant that there are different levels of processing. These different levels, however, cannot be accounted for in a prototype model, because when every subtype of a concept must be redefined, this may lead to a strong increase in complexity that may have easily been prevented when exemplar knowledge was used.

In the bird example, the complexity of the subtypes of a concept can be easily shown. A flamingo would be classified as a bird, and within the category of birds, as a pink bird (along with some parrots), but also as a bird with long legs (along with the heron and the stork), a water bird (along with ducks and cranes) and on and on. The abstractions that are present about birds is thus not hierarchical in nature and would thus be more efficiently described if there were some abstract information that would be supported by some instance-specific information.

When looking at the discussion in this thesis, the shortcomings of the prototype view as proposed by Ross & Makin (1999) may in fact account for the ambiguity problem that arises in the computational grammars that are built along the theoretical ideas of GG. The abstractions redefine smaller and smaller parts of the initial definition, which may cause for a strong increase of complexity which may lead to ambiguity. This is, however, only speculation, and needs further investigation.

Ross and Makin (1999) also find shortcomings for an exemplar approach. The main shortcoming of this approach is that it cannot explain how it is possible that idiosyncrasies seem to have no effect on category forming. It is expected that if a person sees a duck with one wing, it will not add to the definition of a bird that it may have one wing. This cannot be accounted for by an exemplar approach. In other words, an exemplar approach cannot account for the fact that there seems to be abstract information that cannot easily be altered. Ross & Makin formulate this as follows: “the exemplar view seems to take away the “categoriness” of categories. That is, why are these instances members of the same category?” (Ross & Makin 1999: 215).

However, Ross & Makin (1999: 216) regard the exemplar view as more explanatory than the prototype view. Most important for them is that the exemplar view is able to account for selective use of knowledge. By selective use of knowledge Ross & Makin mean that only relevant information is used and classification is thus mostly based on the most similar exemplars. This accounts for the fact that in a certain context a duck can be the most prototypical bird, while in others a sparrow may be more prototypical. However, it must be emphasized here that this could also be accounted for within a view that considers both exemplar-like processing and abstract representations.

A second strong trait of the exemplar approach to categorization is that an exemplar model does not combine abstract information, as is done by a prototypical definition, but has greater sensitivity to relational information, such as frequency, feature correlations and variance (Ross & Makin 1999: 216). However, also here it can be argued that an abstraction based mechanism could also use frequencies and probabilities in this process but keep representations completely abstract.

Ross & Makin (1999: 216) point out that there is much evidence that both approaches take place in a parallel fashion. They cite numerous studies in which both approaches were met. These studies have led to many different models of the cognitive representation of categories that combine exemplar and abstraction based processing.

One of those studies is Spalding & Ross (1994). In this study it is researched if exemplars are, as was proposed by L2LP, used for acquisition. This study investigated if people use more than memory of instances for the forming of new categories. Participants were given a task to learn new categories that were dependent on correlations between different features, such as colours. Spalding & Ross (1994: 1261) found evidence for exemplar as well as abstraction based processing in category formation. They found even when it was shown that people use an exemplar strategy for classification of a new category, they end up learning something more general about this category

According to Ross & Makin (1999: 235) there is now consensus among cognitive psychologists that there are both specific and more general representations that play a role in concept and category formation.

There are also linguists who support the idea of parallel exemplar and abstraction based processing. As we have seen in Chapter 3, the L2LP model assumes that for the processing of sound categories, there is a role for concrete knowledge as well as abstractions. When looking at the evidence that is put forward by cognitive psychology about the role of exemplars and abstractions in the acquisition and the learning of concepts and categories, it seems that a linguistic model is required that has a more central role for exemplar processing than the L2LP model. Adele Goldberg's book 'Constructions at Work' (Goldberg 2006) has an interesting view on the functions of exemplars and abstractions in syntactic processing. Goldberg's theory is called Construction Grammar (CG) and it has an interesting viewpoint for the current discussion.

Goldberg's CG is the only grammatical theory discussed in this study that emphasizes that there is abstract as well as concrete knowledge of language stored in the human linguistic competence. On the one hand, Goldberg (2006) cites numerous studies in which it was shown that there is item-specific knowledge of language, even when the form is fully regular and thus predictable. This storage of predictable forms was found in every subfield of linguistics; phonetics, phonology, morphology, syntax and discourse. On the other hand, Goldberg (2006: 58) also emphasizes that language is creative in nature and sensitive for rules. The most obvious example that there is a cognitive representation of grammatical rules, is that every speaker of a language community will be able to see that the sentence 'John Mary kiss' as ungrammatical (even though, according to Goldberg (2006: 58) this may not prevent them from understanding what the sentence means, which may lead to storing it as a construction when it is heard more often).

Goldberg (2006: 63-64) claims that as there is so much evidence for item-specific knowledge as well as generalizations, a grammatical theory must be able to account for the fact that both are part of the linguistic competence. She regards language as an accumulation of linguistic concepts, which are comparable to non-linguistic concepts and are stored in the memory.

Goldberg expects that there is no such thing as an independent language faculty. She rejects the AUTOKNOW hypothesis of GG. Language is, according to her, part of the whole of conceptual thinking capacities of the human brain, which is strongly connected to memory (Goldberg 2006: 223). Language acquisition is thus a process that correlates in the acquisition of conceptual thinking, which is, as a consequence, also believed to be under strong influence

of the memory. The storage of exemplars also accounts for frequency effects, for stored items are easily counted and compared to other groups. As was assumed by Ross & Makin (1999), also Goldberg emphasizes that the learning of concepts is believed to happen by means of exemplar storing, which leads to new abstract knowledge.

In CG language exists of a collection of ‘constructions’. A construction can be every possible linguistic utterance that shows some level of arbitrariness (Goldberg 2006: 5), in other words every linguistic utterance, as every linguistic sign, is considered arbitrary⁵. Constructions may thus have different levels of abstractness, complexity and different sizes; Goldberg gives the following examples of constructions (Goldberg 2006: 5)

Morpheme	e.g. pre-, -ing
Word	e.g. avocado, anaconda, and
Complex Word	e.g. daredevil, shoo-in
Complex Word (Partially filled)	e.g. [N-s] (for regular plurals)
Idiom (filled)	e.g. going great guns, give the Devil his due
Idiom (Partially filled)	e.g. jog <someone’s> memory, send <someone> to the cleaners
Co-variational conditional	The X-er he Y-er (e.g. the more you think about it, the less you understand)
Ditransitive (double object)	Subj V Obj1 Obj2 (e.g. he gave her a fish taco; he gave her a muffin)
Passive	Subj Aux VPpp (PPby) (e.g. the armadillo was hit by a car)

Constructions, as can be seen in these examples, can thus be very abstract, such as the Ditransitive construction, but also more concrete such as the Complex Word construction. On the other hand there are filled and partially filled idioms and also completely filled constructions; in other words, there is great variety of constructions. Goldberg (2006: 62) emphasizes that for every construction there is also storage of exemplars.

⁵ Goldberg (2006) mentions that even onomatopoeic expressions, which are often brought forward as examples of non-arbitrary language signs as there is a correlation between the form and the meaning, are actually arbitrary as they are not universal in nature. Japanese cows make different sounds than Italian; it can thus not be predicted what the meaning of an onomatopoeic expression or word may be.

As every linguistic instance can be defined as a construction, there is thus less abstraction than in Generative Grammar. While GG is trying to define deep-structures from which it is believed that surface-structure are derived, Goldberg (2006: 19 and on) regards the investigation of the surface form, which is the form that is actually uttered and that Chomsky would refer to as performance, as more important than an underlying form. As opposed to Chomsky, who regards many surface forms as different variants of the same underlying form or 'deep-structure', according to Goldberg, the surface forms have slight differences in meaning, which need to be addressed by a grammatical model (Goldberg 2006: 19 and on). Another difference with the GG model, is that the constructions are often defined by semantic terms. CG thus rejects the AUTOSYN hypothesis, which claims that syntax is independent of semantics. Goldberg (2006: 5) emphasizes on the importance of describing constructions along with their meaning. Within CG a semantic explanation is seen as more meaningful to linguistic theory than an explanation independent of semantics. Goldberg stresses that the main function of language is to convey meaning; it is thus to be expected that the form of an utterance may be an indicator of its meaning.

Goldberg also emphasizes on the creativity of language use. She quotes numerous examples of creative language use, such as "He sneezed his tooth right across town" (Goldberg 2006: 6), which show that there is not necessarily a difference between what Chomsky calls syntax and what he calls the lexicon. In GG the verb 'to sneeze' would have been stored in the lexicon along with pronunciation and some syntactic information such as that it is intransitive. This information could be put to use by applying this verb in syntactic rules of the linguistic competence. Goldberg, however, makes clear that there is not so clear a distinction between syntax and lexicon. She argues that possibly the majority of language processing is based on these 'less-abstract' and semantically defined constructions, and thus not completely formal and independent of semantics as the highly abstract syntactic rules that are proposed by Chomsky. Goldberg however, emphasizes that even though there might actually be syntactic processing that is independent of meaning, it does not necessarily mean that all syntactic processing is.

CG, ET/DOP as well as L2LP, do not assume a real acquisition period. The learning of language is regarded as a process that continues throughout life.

Infant language acquisition is, according to Goldberg (2006: 70), in the first stages strongly dependent on frequency. As is assumed in the L2LP model, the earliest acquisition consists of distributional learning. After having acquired phonetic units, the child will gradually enlarge

the units of linguistic learning, until it can produce small sentences, existing of two or three words. Goldberg (2006: 72) does not expect children to acquire constructions before they are three years of age. The first constructions are expected to have been acquired by the time children start making overgeneralizations. It is assumed that children can recover from these overgeneralizations by indirect negative feedback. In GG the fact that children do not receive negative feedback is often seen an argument in favour of the nativist view, while Goldberg thinks that as children are highly sensitive for frequency cues in language, they will receive constant negative feedback by means of frequency patterns. In other words, the lack of production of certain forms and sentences is regarded by the child as indirect negative feedback.

Another influence on child language acquisition is the child directed speech that parents use towards children. In corpora of this type of speech it turned out that parents use an unpredictable amount of sentences that contain the verbs 'go', 'put', 'give' and 'make'. According to Goldberg (2006: 78) this is no coincidence, as these verbs are perfect examples of the Intransitive Motion (X moves Y), the Caused Motion (X causes Y to move Z), the Ditransitive (X causes Y to receive Z) and the Resultative construction (X causes Y to become Z), which are regarded as important and frequently used constructions in adult language. The overuse of these verbs by parents is thus a means of acquisition for children.

What Goldberg proposes for language processing throughout life and thus also in 'acquisition' is that new constructions are stored along with their meaning, as is proposed by ET/DOP.

The difference from ET/DOP is that, in case of similarities between stored utterances, also their constructions are stored. With the increase of utterances with similar constructions, the abstract knowledge of this construction also increases. This process resembles the acquisition process of phonetic categories as is proposed in the L2LP model.

Goldberg addresses the question why generalizations are learnt extensively. The main force that she regards as driving the generalization of construction is the desire to speak and to be understood. And as language is a system that is able to produce infinitely many sentences it is not enough to only store linguistic instance, but it is necessary to generalize at least to some extent in order to produce and understand new sentences (Goldberg 2006: 103).

Goldberg expects, as is proposed by the L2LP model as well as DOP, that also in adult stages of linguistic experience, there are frequency effects on language processing and acquisition.

The production of every construction, in early as well as later language use, is influenced by frequency of perception and production (Goldberg 2006: 5).

These frequency effects have a constant influence on the linguistic competence of a language user. If a new construction is heard often enough, they will be used and regarded as grammatical in the end. Goldberg (2006:74) quotes a study by Kashak and Glenberg (2004) in which the construction 'this shirt needs washed' was studied. It turned out that participants only needed small exposure to this construction in order to be able to understand it and start using it.

She also mentions that adult language users are able to generalize in linguistic learning of a second language, in this case an artificial language. She quotes a study by Hudson and Newport (1999) in which it was shown that adult language users can generalize on the use of determiners in a novelty language. She also cites a study in which a more complex generalization task was required: in a study by Gomez (2002) it was shown in an artificial grammar task that when the predictability of adjacent dependencies decreased, the awareness of dependencies between first and third elements increased.

This shows that even adult language users have complex and subtle learning capacities for linguistic data, as was earlier proposed by ET/DOP, L2LP and L2UG. In this study GG's critical period hypothesis is thus regarded as untenable.

5.3 Summary and further discussion

When looking at the evidence on exemplar and abstraction-based processing that is brought forward by the GG, ET/DOP and L2LP models, the idea arises that there may be exemplar as well as abstraction based processing in the linguistic competence. This combination of processing units is also found evidence for by the field of cognitive psychology in the acquisition of concepts and categories. Within cognitive psychology, there is even consensus among scientists that there is abstract as well as item-specific knowledge of members of categories and for concepts; the knowledge of a category that is available to a person thus consists on the one hand of abstract information and on the other hand of perceived exemplars of this category.

A linguistic counterpart of this idea is reflected in the theory of Construction Grammar (Goldberg 2006). Construction Grammar regards language as a collection of concepts and categories. In this grammatical theory language is regarded as a complex of constructions, which can be definitions of every linguistic utterance that shows some level of abstractions. Goldberg's constructions are in the first place semantic descriptions of surface structures, as opposed to Chomsky's formal descriptions of deep-structures. Constructions are not innate, as is assumed by GG, but are learnable. The acquisition process is assumed to take place throughout life by means of storage of exemplars along with meaning, and frequency, as is also proposed by ET/DOP and L2LP. Children are expected to learn these constructions under influence of the child directed speech of their parents, as was suggested by GG, yet this is expected to happen along with a strong sensitivity for frequency of patterning, as is suggested by ET/DOP and L2LP. The overgeneralizations that children make when getting acquainted with constructions are amended by taking frequency of production of the speech in their environment as indirect negative evidence.

The Construction Grammar model clearly shows that a grammatical theory can make use of both exemplars and abstractions. This is also proposed by the L2LP model, however, in the L2LP model the storage of exemplars only takes place in case of a learning task, while in CG the storage of exemplars is a continuous process and is independent of the fact that there is also abstract knowledge available. In the CG model there is thus a more consistent role for exemplar storage and thus also a more transparent solution for language change.

Regarding the modelling of language acquisition, the CG and L2LP frameworks show great similarities. Both theories expect a gradual growth of complexity and size of abstractions. However, in the CG approach increase of exemplars is of constant influence to the abstract

knowledge, while in the L2LP model there is no more storage of concrete data once more abstract categories are defined.

The stored abstractions that are assumed in the CG model provide a good solution for the head-filling-up problem that resulted from the ET/DOP model. In the CG model, there is the possibility to discard, or forget, exemplars as long as relevant information is stored. In this way, it is likely that recent exemplars are stored and past exemplars are forgotten, even though some relevant information may be stored in the abstract information that is available about the category.

It seems that the coexistence of exemplars and abstractions can also account for linguistic acquisition as well as linguistic change, which were impossible to explain in the Generative Grammar approach. In addition, the Construction Grammar model can even account for reanalysis, which is the phenomenon that people make the ‘wrong’ analysis of a certain construction. In Chapter 1 it was discussed that when regarding language as a closed system of rules, as is done by GG, it cannot be explained why structures are often observed to be reanalyzed.

Within the CG model, reanalysis may be seen as follows. The continuous storage of exemplars may influence the abstract knowledge of this category. When there is a consistent change in the input of new exemplars, this may lead to a reinterpretation of the abstract knowledge that was available up to that moment. The change of this abstract information may have an influence on other exemplars that fit within this category.

However, even though the CG model may give an explanation for how language change takes place, it is not necessarily explained *why* it takes place. In the last paragraph of this discussion a possible account is provided.

5.3.1 Competing motivations

It seems that almost every discussed theory that makes use of abstractions meets problems explaining why linguistic change takes place. Intuitively there seems to be a close relation between the formation of abstractions and the change of language, as it is a result of language change that in the new variant of language there appear to be different abstractions than in the previous variant.

In this discussion it is defended that the motivation behind the formation of generalization may provide a solution to this problem.

Goldberg regards the desire of the human brain to speak and to be understood as the main force behind the formation of generalizations. This motivation logically implies the most overlap as possible between the linguistic knowledge of the different speakers within a language community; the desire to be understood thus does not explain why it is that linguistic knowledge seems to change so continuously.

When looking at the discussion in this thesis, the idea arises that abstraction merely functions as a means of making storage more efficient. Theories such as GG, L2UG and L2LP emphasize on how generalizations make *linguistic processing* more efficient. However, could it be that generalizations only make *storage* more efficient? The difference between the two may seem subtle and insignificant, however it will be defended that this may be an important motivation behind the processing of the human mind.

When regarding the different views on exemplar and abstraction based processing, the idea comes to mind that the exemplar and the abstraction based approaches are two competing motivations in the human brain. The first force is storage, the human mind wants to store everything that is encountered in life. This desire is driven by the desire to know everything. The second force is efficiency. This desire is driven by the desire to use and thus retrieve all the knowledge that is stored as easily as possible. This last desire thus continuously goes over the stored data, in order to find rules and regularities in order to replace redundant information by an abstract representation.

So, on the one hand the mind desires to store everything, on the other hand another mechanism is trying to make this storage more efficient by replacing it by abstractions when

there is redundant information available. This desire, in contradiction to Goldberg, is independent of a desire to be understood, and, as was mentioned before, is even independent of language. It can be argued that only when a force behind linguistic processing is independent of a desire to be understood, it can explain how it comes that language seems to change continuously.

This viewpoint seems rather interesting for the discussion of this thesis. The Generative Grammar paradigm were the first ones to discover how complex and how arbitrary some syntactic structures are, while others are less complex. GG still maintained the expectation that when studying these syntactic structures extensively, in the end the underlying system, which was expected to be self-containing and deterministic, would be unveiled. ET and DOP brought against this that there seems to be no structure in language at all. They argued against GG was that at least language is not a closed system, but maybe even a number of different systems that have some overlap, but are absolutely not the ideal deterministic grammatical competence that was proposed by GG. Also CG observed that the linguistic competence seems to exist of a chaos of abstractions with different levels of abstraction, different levels of independence of semantics and next to this enormous variety in abstraction there also appears to be an enormous bulk of exemplar information.

In this discussion it is argued that this chaos is an indication that the formation of abstractions is merely a matter of making storage more efficient, rather than making linguistic processing more efficient. Of course it can be argued that if this abstracting force makes storage more efficient, as a consequence the linguistic processing becomes more efficient, however this is not necessarily the case. If a device that is independent of linguistic motivations induces abstractions from available data, it can thus make reanalyses, which actually seems to make understanding more difficult.

At this point something should be mentioned that is often neglected by linguists, namely the fact that the meaning conveying function of language actually is not as perfect as is often suggested. Especially GG, but also other grammatical theories, tend to emphasize how speakers of a language can effortlessly understand complex sentences, however in daily use it is often seen that people do not understand each other that well. Simple messages with simple syntactic structures seem to be understood quite effortlessly. However, as soon as a speaker tries to convey a non-trivial semantic message, it seems that people have great difficulty in

understanding each other. In the extreme example of a political debate or a scientific lecture, it seems that every listener will have a different opinion of what the content of this lecture was. Here linguistic interpretation and parsing touches on the process of extraction of the intention of the speaker. However, it can be argued that there is a close relation between these two processes.

As support for this idea, in the following chapter an example of reanalysis will be experimented. It needs emphasis here that the occurrence of linguistic change is of no advantage of mutual comprehension between the speakers of a language community. The indication that reanalyses seem to take place, may be an indication to the above proposed system of competing motivations.

Chapter 6 Reanalysis Experiment

6.0 Introduction

One of the recurring topics in the different models and their views on the function of exemplar and abstraction based processing that are discussed in this study, is the question why it is that languages change.

Generative Grammar had the most difficulty in accounting for language change. In a system that assumes only abstract knowledge for linguistic processing and at the same time this abstract knowledge is assumed to be innate, as the human mind is not capable of acquiring them from the available language data, there is no way to account for language change.

It seems, however, that language change can be more easily explained in theories that assume a role for exemplar processing relevant for language.

Theories as ET/DOP and L2LP emphasize that continuous storage leads to continuous acquisition of language concepts and may thus lead to a continuous change of concepts in the linguistic competence, which may eventually lead to language change. In the discussion in chapter 5 it was argued that this is not enough of an explanation to account for language change.

The idea that was put forward in Chapter 5 was that the solution for the exemplar versus abstraction based processing may lie in the solution that these two forms of processing are competing forces in the human mind. On the one hand there is the desire to store everything that is encountered in life, on the other hand there is a desire to make this storage more efficient by replacing redundant information by abstract information. This model can actually account for linguistic change, and also for the fact that linguistic change often seems to hamper comprehension between different speakers, generations or communities. When seeing linguistic processing as two competing motivations that are not linguistic of nature, it can be understood how it comes that language change takes place, while it does not facilitate the mutual understanding between speakers.

An example of a situation in which linguistic change seems to be no advantage for mutual comprehension, is reanalysis. Reanalysis is the phenomenon that a structure is interpreted as an other structure than it actually is.

A morphophonological example of reanalysis in Dutch, as was earlier mentioned in Chapter 1, is the word 'schoen'. This word was a plural in middle-Dutch. In English and German it is still seen that the word is derived from the word Schoe (English Shoe, German Schuh). In

Dutch the plural is formed by adding –en. However, if a word ends in a vowel, the plural was formed by adding only –n.

Following this analogy the plural form of Schoe would be Schoen.

In seventeenth century Dutch, however, this rule changed. Words existing of only one syllable no longer only received –n as a plural, but as every other noun these words now also received –en, as in Zee (Sea), Zeeën. When this rule was completely accepted, the word Schoen was no longer interpreted as a plural, since there were no more words existing of only one syllable that were plural. The word was thus reanalysed as a singular, and the new plural became Schoenen (Philippa, 1999: 37).

This example of reanalysis happened many centuries ago, but also in the variant of Dutch that is spoken today reanalyses are happening continuously. A syntactic example of reanalysis that may be happening at this moment, is a shift in the Dutch passive voice.

In the official grammar of Dutch, *Algemene Nederlandse Spraakkunst (ANS)* (Coppen & Haeserijn 2004), only the object can be promoted to Subject by using a passive construction, as is seen in (1) and (2).

- (1) Jan geeft een boek aan Piet
Jan gives a book to Piet
Jan gives a book to Piet
- (2) Het boek wordt (door Jan) aan Piet gegeven
The book becomes (By Jan) to Piet given
The book is given to Piet (by Jan)
- (3) Piet wordt een boek gegeven (door Jan)
Piet becomes a book given (by Jan)
Piet is given a book (by Jan)

Sentence (3) is officially not a passive, but a subjectless construction with an Indirect Object that is fronted. In standard Dutch, only Objects and thus not Indirect Objects can be promoted to subject-status by using a passive construction. And since Piet is the Indirect Object of (3), he cannot serve as the Subject of the sentence, according to the ANS (Coppen & Haeserijn 2004). When Piet is replaced by a pronoun, the correct phrase would be (4).

- (4) **Hem** wordt een boek gegeven (door Jan)
Him becomes a book given (by Jan)
 He is given a book (by Jan)

The fact that ‘him’ is used instead of ‘hij’ most clearly illustrates the non-subject status of Piet in (3).

Nevertheless, nowadays it seems that sentence (3) is more and more reanalyzed as a real passive construction with Piet as its Subject.

An example of this phenomenon is (5), which is frequently heard in public transport. Also in (5), the constituent ‘de reizigers’ is the Indirect Object of the sentence and can thus not be the Subject of the sentence. However, in sentence (5) this constituent is actually reanalysed as Subject; the Subject status of ‘De reizigers’ is shown by the agreement between this constituent and the main verb ‘worden’, which is in plural.

It is important to remember that example (5) is especially interesting because the public transport is an official authority and is therefore expected to use grammatical forms of Dutch. It is not likely that the workers of the public transportation speak a dialect for two reasons. Firstly, this sentence is heard in trains across the country, secondly it is not to be expected that the train conductors use a dialect since they are addressing the travellers in the train and it is generally expected that the standard form of a language is used when a crowd is addressed.

- (5) **De reizigers worden** verzocht de trein te
 The travellers become requested the train to
 verlaten.
 leave
 Travellers are requested to leave the train.

It is important to mention that this sentence is heard very frequently and it seems not to be regarded as an exception by many speakers of Dutch, although there seems to be a difference in whether these users find the sentence an acceptable sentence of Dutch or not.

The standard form of this sentence is shown in (6). In (6) there is no agreement between ‘de reizigers’ and the verb; this shows that ‘de reizigers’ is not a subject in this sentence.

- (6) **De reizigers wordt** verzocht de trein te
 The travellers become requested the train to verlaten
 Leave
 Travellers are requested to leave the train

Also sentences such as (7) and (8) are no longer exceptions but are often heard, despite the fact that they are vernacular forms and therefore not accepted in formal written language.

- (7) **Hij** wordt een boek gegeven.
 He becomes a book given
 He is given a book
- (8) **Hij** werd iets laten zien.
 He became something let see
 He was shown something

To test the grammatical status of these frequently heard constructions, an exploratory experiment was conducted, which is described in this chapter.

The research question focused on whether Dutch native speakers have indeed reanalyzed the above mentioned examples as subjects instead of Indirect Objects of Dutch sentences. Since it is only a small-scale experiment, its main function is to investigate the possibility if there are users that indeed have reanalyzed this construction as a possible sentence of Dutch. If this is the case it might provide some evidence that language processing may be under influence of a mechanism that is not necessarily driven by the desire to be understood, as was proposed above, but may be driven by another motivation.

There are also a number of other theoretical issues that were discussed in the previous chapters that are addressed in this experiment.

Firstly, as was seen in Chomsky's theory, in the 'steady state' of language use the Universal Grammar module that is needed for linguistic acquisition is not available; consequently a language user is not able to change his or her knowledge of language. In this experiment it will be investigated if different language users that are past puberty may have a different linguistic intuition on the Subject status of Indirect Objects. Although, it may be the case that the older speakers of Dutch have acquired a different form of Dutch, this is not to be expected especially since the sentence like (5) has only recently started to be used by official authorities

that are expected to use standard Dutch.

If this were the case that the participants have different intuitions about the sentences of the experiment, it might indicate that language users may have the possibility to change knowledge of their L1 when they are in the steady state.

Chomsky also states strongly that all speakers of a language share the same knowledge of this language. This experiment will also investigate if different speakers may have different intuitions on a syntactic matter. This might indicate that speakers of a language may not share the exact same knowledge of this language, although they may have great overlap.

Secondly, this experiment might also give some insight in the influence of frequency on grammaticality judgments. Many theories that are discussed in the previous chapters, such as ET, DOP, L2LP and CG, emphasize that humans are extremely sensitive to frequency distributions. As for this experiment, sentences such as (5), which are ungrammatical sentences of Dutch, are heard much more often than the sentences (4), which is a grammatical sentence. Sentences such as (7) and (8) are ungrammatical and are heard very rarely. It will thus be interesting whether speakers of Dutch will regard the sentences grammatical that actually are grammatical or if they will judge the sentences as grammatical that they perceive most frequently. Thus, this experiment researches what effect the frequent perceiving of the sentences A might have on the grammaticality judgments on this sentence.

6.2 Method of the experiment

A number of twenty-four participants were presented the following 4 sentences, which are all ungrammatical according to the ANS (Coppen, Haeserijn & de Vriend 2004):

A

1 **Hij** wordt gevraagd om minister te worden.

He becomes asked to minister to become

He was asked to become minister.

2 **Ik** werd verzocht het gebouw onmiddellijk

I became requested the building immediately

te verlaten.

To leave

I was asked to leave the building immediately

B

- 1 Hij wordt een boek voor zijn verjaardag gegeven.
 He becomes a book for his birthday given
 He was given a book for his birthday
- 2 Hij wordt de nieuwe collectie gepresenteerd.
 He becomes the new collection presented
 He is shown the new collection.

The difference between the sentences A and B lies in the meaning of the verb as well as the frequency of perception. Regarding semantics, the verbs in A have a meaning in the realm of ‘ask’ and ‘request’, which require a DO, the verbs used in B have distinct meanings that require indirect objects. Regarding frequency, the sentences of A are heard frequently while the sentences of B are heard rarely and are highly marked and regarded as ungrammatical.⁶ The following table gives a clear picture of the grammaticality and the frequency of the three sentence types.

Table 1. Grammaticality and frequency of experiment sentences.

	A1&2	B1&2	C1&2
Grammaticality	Ungrammatical	Ungrammatical	Grammatical
Frequency	Frequent	Infrequent	Infrequent

Firstly, the participants were asked whether they found the sentences A and B acceptable or not. An explanation for their judgement was also required, if they would know an explanation for their judgments. Both questions were asked without any suggestion of a solution and it was also explicitly stated that an explanation was only required if they instantly knew one, in order to avoid the participants to recall or look up explicit knowledge.

Subsequently, the two sentences in C, which are both grammatical according to the ANS, were presented to the participants. It is important to remember that these sentences, although grammatical, are heard less and less in daily use.

⁶ Although I did hear both sentences B1 and B2, B1 I heard on a birthday party and it was corrected by a friend of the speaker. Sentence B2 I actually heard on television, in RTL-4’s RTL Boulevard, a lifestyle program. In this show they were speaking of Tom Ford’s (fashion designer) new collection and Dutch celebrities that went to see the show.

The reason for the order in which the sentence sets were presented was to ensure spontaneous reactions from the participants. It was argued that if they would see the sentences of C, which are grammatical, first, their grammaticality judgments on A and B, which are both ungrammatical, might be influenced, since this set might remind them of the correct forms.

In this experiment, it was tried to have the participants make the least possible use of explicit knowledge that they might have learnt in school or elsewhere. Therefore, a number of lines were left empty, so that the participants would have to scroll down for the sentences of C. By doing this, the C sentences, which are grammatical but infrequently heard, could not be seen when the participants judged the A and B sentences, which are both ungrammatical.

C

- 1 **Hem** wordt gevraagd om minister te worden
 Him becomes asked to minister to become
 He was asked to become minister
- 2 **Mij** werd verzocht het gebouw onmiddelijk
 Me became requested the building immediately
 te verlaten.
 2To leave
 I was asked to leave the building immediately.

The questionnaire has been enclosed in appendix 1.

The questionnaire was sent by e-mail to approximately forty people, out of whom twenty-seven responded.

The participants were mostly friends and colleagues and their parents, who all live in different parts of the Netherlands. They were carefully selected as to their usage of Dutch on a daily basis. Not having too much explicit grammatical knowledge was another selection criterion. Therefore, there were no students of Dutch language or general linguistics among them. A number of questionnaires that were sent back were rejected as irrelevant for this experiment because the respondents who filled them in did not meet the pre-established criteria. One participant had not lived in the Netherlands for over a year and had not spoken much Dutch in

that period. Two participants stated they had recently started to study Dutch linguistics. Their literal responses of the twenty-four participants that are left, can be found in Appendix 2 and are translated to English.

6.2.1 Hypotheses

The main aim of this experiment is to investigate whether a reanalysis of the Dutch passive voice is possibly happening at this moment of time. If it turns out that reanalysis is taking place this might provide some evidence that exemplar and abstraction based processing may be seen as competing forces in the human mind.

In order to investigate this, a number of hypotheses are formulated.

Hypothesis 1: Sentences of A and C will be judged grammatical more often than B.

All participants: A and C more grammatical than B

As can be seen in Table 1, the sentences of A and B officially are all ungrammatical.

Yet, in this experiment it is not expected that the majority of participants will actually judge all of them ungrammatical, because the sentences of A are heard frequently despite the fact that they are ungrammatical.

If there are any participants at all that judge some of the sentences as grammatical, it indicates that a reanalysis may be going on in the minds of these speakers of Dutch.

Hypothesis 1, however, also gives a insight on frequency effects. Sentences like A are heard often enough to expect the participants to regard them as grammatical. Sentences like B, however are heard infrequently and are highly marked. It is expected in this experiment that most of the participants will find those sentences ungrammatical.

Hypothesis 1 will thus give an idea if there is an example of reanalysis happening at this moment and will also give an idea of the effect of frequency of perception on grammaticality judgments.

For the testing of the first hypothesis every of the twenty-four participants could be used, since this is the most general hypothesis in which it is researched which sentences are regarded as grammatical and which are not.

As follows from Aitchison (1981), older speakers are more ‘conservative’ in their grammaticality judgments. It is generally expected that older generations will use old forms rather than younger generations (Aitchison, 1981:179).

This idea formulates hypothesis 2.

Hypothesis 2: It is expected that ‘older’ speakers of Dutch will find only the official sentences (C sentences) grammatical, while the ‘new’ form (A sentences) will sound ungrammatical to them.

Older participants (men and women): C more grammatical than A

If hypothesis 2 is supported by the data, it suggests that within a language community, (L1) speakers may have different cognitive knowledge of their language. This is expected by ET, DOP, L2LP and is rejected by GG and L2UG.

The conservatism of older speakers might also give an indication towards exemplar learning as suggested by ET and DOP and L2LP. This can be seen as follows.

In the corpus of the older speakers there might be so much data stored that it will be harder to influence the probabilities that are attached to the data. The frequent hearing of ungrammatical sentences like A may thus have less effect on older speakers than younger speakers, who have stored less linguistic exemplars and are thus more easily influenced by the production of the environment.

For testing hypothesis 2, participants with different age ranges were needed. In order to test this, the group was split in two age groups. The border was drawn at the median of the ages of the participants. The median of the participants’ ages was participants have forty-seven and thirty years of age; the median was thus decided to be at thirty eight and a half. For simplicity matters, this number was rounded off to forty years of age.

In total there were twelve participants older than forty and twelve participants younger than forty.

Literature on linguistic change (Aitchison 1981:77, Stroop 1998: p 7 and on) sums up a number of studies on linguistic change where women were ahead of men in using new linguistic forms of their languages. Stroop (1998) speaks of a phonological change in Dutch pronunciation where women are ahead because of emancipation reasons. As the speaking of a

dialect was first seen as ‘manly’ and ‘virile’, now the emancipated women take steps ahead in speaking a new dialect. According to Stroop, this is part of a more general tendency that women are trying to become the ‘stronger gender’ (Stroop 1998 – p 84).

Aitchison (1981: 78) emphasizes that explanations as mentioned above are not general in nature and do not show universal patterns. However, since it is often observed that women use new forms of language before men, in this thesis it is regarded a possibility that women are ahead in linguistic change.

From an exemplar perspective, there seems to be a tentative suggestion why women are ahead in linguistic change. Women are seemingly a little better than men at memorizing and retrieving (Speck et al, 2006)⁷. This may imply that women would be better at storing exemplars and thus quicker in acquiring a new grammatical category. This is only a speculation and has never been researched with regard to linguistic change, as far as this investigation has revealed. The study of Speck et al (2006) regarded the memory for pictures. This observations lead to the formulation of Hypothesis 3.

Hypothesis 3: Women are ahead of men in regarding the new forms as grammatical.

Hypothesis 3a: It is expected that among the participants of the younger generation, there might be a tendency that women will regard the new forms (A sentences) as grammatical more often than men.

Young women: (grammatical) $A > C$

Hypothesis 3b: It is expected that among the participants of the younger generation, women will judge the old forms (C sentences) more often ungrammatical than men.

Young women: (ungrammatical) $C > A$

In order to test hypothesis 3 male and female participants under the age of forty were needed. In total there were seven men and five women under the age of forty.

6.3 Results

The literal results of the experiment can be found in appendix 2 and 3. In the following paragraph, only the results that discuss the above formulated hypotheses will be presented.

⁷ This is a relationship destroyer cliché. A number one bestseller ‘relationship rescue’ right now is the book ‘Why men never remember and women never forget’ by Marianne J. Legato. However this is a highly unscientific work and is only mentioned for the purpose of irony.

6.3.1 Hypothesis 1

The participants were presented with a grammaticality judgment test, in which it was asked if they found the sentences grammatical or not. In practice, it turned out that the participants added a third category of acceptable but strange. As there were so many people that stated that they found the sentence weird but did not regard the sentence as ungrammatical, I adopted this third category in this study and named it ‘Acceptable but strange’. The participants were also asked if they found the A sentences or the C sentences most grammatical.

Table 1, is repeated here in order to see what the grammatical status and the frequency of the presented sentences is.

Table 1. Grammaticality and frequency of experiment sentences.

	A1&2	B1&2	C1&2
Grammaticality	Ungrammatical	Ungrammatical	Grammatical
Frequency	Frequent	Infrequent	Infrequent

A simple calculation of the scores for each sentence group is made by adding the numbers of grammaticality judgments. Remember that each participants were asked for two grammaticality judgments per sentence group. In total there are thus forty-eight judgments per sentence group. These results are in the table 1.1:

Table 1.1 General scores (absolute)

	A1&2	B1&2	C1&2
Correct	24	0	34
Acceptable but strange	7	1	6
Unacceptable	17	47	8
Total	48	48	48

Table 1.2 General scores (percentage)

	A1&2	B1&2	C1&2
Correct	50	0	70
Acceptable but strange	15	2	12
Unacceptable	35	98	17
Total	100	100	100

The first hypothesis formulates the expectation that for all the participants the sentences of A and C sound more grammatical than B.

This hypothesis is supported by the experiment. The sentences A were regarded grammatical by 50 percent of the participants and C was regarded grammatical by 70 percent of the participants, while there is no participant that judged the sentence of B grammatical.

Hypothesis 1 is thus supported.

However there is more that can be read off from this table. There seems to be a tendency that the sentences of C are more often regarded grammatical than the sentences of A. This coincides with the fact that the C sentences *are* grammatical, while all the others are not. Also the sentences of A are more often judged ungrammatical than the sentences of C; thirty-five percent of the participants regarded the A sentences ungrammatical, while only seventeen percent regarded the C sentences ungrammatical. The difference between these two numbers agrees with the fact that the A sentences are actually ungrammatical while the C sentences are not. Still, it is surprising that there are so many participants that regard a grammatical sentence ungrammatical.

6.3.2 Hypothesis 2

Hypothesis 2 formulates the idea that older speakers may have other grammaticality judgments than younger speakers. More precisely, hypothesis 2 formulates that older speakers of Dutch will regard the sentences of A more often as ungrammatical than younger speakers of Dutch. Hypothesis 2 also expects that there will be more young speakers of Dutch that regard the C sentences as ungrammatical than older speakers of Dutch.

Table 1 is repeated in order to remember what is the grammatical and frequency status of the three sentence types.

Table 1. Grammaticality and frequency of experiment sentences.

	A1&2	B1&2	C1&2
Grammaticality	Ungrammatical	Ungrammatical	Grammatical
Frequency	Frequent	Infrequent	Infrequent

In the following tables the results are presented by age group.

Table 2.1 Age scores (absolute)

	A1&2		C1&2	
Age	40+	-40	40+	-40
Correct	8	16	21	13
Acceptable but strange	4	3	2	4
Unacceptable	12	5	1	7
Total	24	24	24	24

Table 2.2 Age scores (absolute)

	A1&2		C1&2	
Age	40+	-40	40+	-40
Correct	33	67	88	54
Acceptable but strange	17	13	8	17
Unacceptable	50	10	4	29
Total	100	100	100	100

Table 2.3 Grammaticality rankings (absolute)

	C better than A	C worse than A	C equals A	Total
40 +	20	3	1	24
- 40	7	10	7	24

Table 2.4 Grammaticality rankings (Percentage)

	C better than A	C worse than A	C equals A	Total
40 +	83	13	4	100
- 40	29	42	29	100

There are a number of striking differences between the 40+ group and the -40 group, which will be referred to as the old group and the young group.

It seems that for the A sentences the opposite tendency is found for the old and the young group. The majority, consisting of fifty percent of the participants in the old group regards the A sentences as ungrammatical, a smaller group, consisting of thirty-three percent of the participants of the older speakers regard the A sentences as grammatical while an even smaller, namely seventeen percent of this group finds them acceptable but strange. For the young group the opposite pattern is found. The majority of the young group, namely sixty-seven percent, regards the A sentences as grammatical, a smaller group, namely thirteen percent as acceptable but strange, and an even smaller group, namely ten percent judged the sentences as ungrammatical. This indicates that the A sentences are more grammatical for the younger speakers than for the older speakers.

With regard to the C sentences there is another pattern. The majority of both groups find that they are grammatical. The difference between the two groups is that there are more participants of the young group that regard the C sentences as ungrammatical, while there is only one ungrammaticality judgment from the old group.

This indicates that the C sentences are more grammatical for the old group than for the young group

When looking at the grammaticality rankings the same pattern is found. It is seen that the majority of the participants in the old group regards the C sentences as better than A, while the majority of the participants in the young group have the reverse pattern, i.e. they regard C sentences as worse than the A ones. It is important to note that there is a considerably larger group that regards C and A equal among the young participants than for the old participants: twenty nine of the young participants regards the C and A sentences as equally grammatical

as there is only one participant from the old group that finds the C and A sentences equally grammatical.

Hypothesis 2 is thus supported because speakers of Dutch that are older than forty find the sentences of C more grammatical than the sentences of A.

6.3.3 Hypothesis 3

Hypothesis 3 formulates the idea that women are ahead of men in linguistic change. This question was subdivided in two hypotheses. Firstly it was predicted that men will find the A sentences, which are ungrammatical, more often ungrammatical than women. Secondly, it was predicted that women will find the C sentences, which are grammatical, more often ungrammatical than men.

Again Table 1 is repeated, which contains the grammaticality and frequency status of the sentences of the experiment.

Table 1. Grammaticality and frequency of experiment sentences.

	A1&2	B1&2	C1&2
Grammaticality	Ungrammatical	Ungrammatical	Grammatical
Frequency	Frequent	Infrequent	Infrequent

The results for hypothesis 3 are shown in table 3.1-4.

In the first two tables, the scores are presented for men and women under forty-seven and their grammaticality judgments for the sentences of A and C. In the last two tables the score for grammaticality rankings are shown.

Table 3.1 Gender scores of the participants under the age of forty (absolute)

	A1&2		C1&2	
	M	F	M	F
Correct	8	8	11	4
Acceptable but strange	1	2	3	1
Unacceptable	5	0	0	5
Total	14	10	14	10

Table 3.2 Gender scores of the participants under the age of forty (percentage)

	A1&2		C1&2	
	M	F	M	F
Correct	57	80	79	40
Acceptable but strange	7	20	21	10
Unacceptable	36	0	0	50
Total	100	100	100	100

Table 3.3 Grammaticality rankings (absolute)

	C better than A	C worse than A	C equal to A	Total
Men	4	4	6	14
Women	3	6	1	10

Table 3.4 Grammaticality rankings (percentage)

	C better than A	C worse than A	C equal to A	Total
Men	29	29	42	100
Women	30	60	10	100

Hypothesis 3a predicts that men will judge the sentences of A more often ungrammatical than women, which is actually supported by the results of this experiment.

As can be seen in Table 3.1 and 3.2, there are actually no women under forty in this experiment that found the sentences of A ungrammatical, while thirty-six percent of the men regards the A sentences ungrammatical.

Also the percentage of grammatical judgments for the A sentences is much higher for women than for men; an overwhelming majority of eighty percent of the women regards the A sentences grammatical, while for the men only 57 percent regards the sentences correct.

Hypothesis 3a also formulated a prediction about the grammaticality rankings of men. The men were expected to find C better than A more often than women. This is not exactly supported by the data.

Most of the men, namely forty-two percent, regard A and C equally acceptable, while the majority, namely sixty percent of the women regard C worse than A. Hypothesis 3a is thus partly rejected. Men do prefer C more than women, but the majority of men does not regard C as better than A, but as equal to A.

Hypothesis 3b predicts that there will be more women that regard the sentences of C ungrammatical than men. For almost eighty percent of the men, the sentences of C are grammatical, while there is no man that regards them as ungrammatical; there is only a number of 'acceptable but strange' judgments. On the other hand, fifty percent of the women regard the sentences of C as ungrammatical. When looking at the grammaticality rankings, it is clear that a majority of sixty percent of the women regards C sentences worse than A ones, while the majority of forty-two of the men find C equal to A. Therefore, hypothesis 3b is supported by the results of this experiment.

There are thus four important observations that contribute to the support of Hypothesis 3, which states that women are ahead of men in linguistic change. Firstly, there is a large majority among the women that regard the A sentences grammatical. Secondly, there is no woman that regards the A sentences ungrammatical. Thirdly, sixty percent of the women regards the C sentences as worse than the A sentences. Fourthly, a majority of fifty percent of the women regards the C sentences as unacceptable sentences of Dutch. Adding up, it is obvious that for women under forty, the sentences of A are highly grammatical.

6.4 Summary and Discussion

The experiment above indicates that a reanalysis of the matter of recipient/subject status might take place in the minds of some speakers of Dutch. The official Dutch grammar (ANS) states that a Recipient cannot be Subject in Dutch sentences.

This explorative experiment found support for the idea that some people do regard sentences that have a recipient as a subject as grammatical. However not every speaker of Dutch shows the same opinion on the matter.

It turns out, that the majority of the participants who were over forty years of age did not regard those sentences as grammatical and they preferred the old form.

The speakers of Dutch who were under forty years of age, however, did regard the new form grammatical. Moreover, the women that were tested in this experiment are ahead in this

example of language change for a number of reasons. Firstly, the women were the only ones who regarded the old form as ungrammatical, secondly a large majority regarded the new sentence form as grammatical, while it was merely men who regarded the new forms as ungrammatical.

One of the theoretical conclusions that may be drawn from this experiment is that linguistic change is actually possible. In the first place, this may tentatively suggest that the model of exemplar and abstraction based processing as competing motivations, as was proposed in Chapter 5, is supported by this data.

With regard to Generative Grammar, this observation also suggests that the human linguistic competence *is* able to change, even when it is in the steady state of L1. The linguistic knowledge of the L1 is thus not as drastically unalterable as GG assumes. Crucially, the participants in the experiment were all in the steady state of their L1 knowledge but, according to the results of the present experiment, some of them seemed to have changed the knowledge of their first language, as is predicted by ET and DOP.

The fact that older speakers of Dutch are behind in the acquisition of the new rule might indicate exemplar learning (ET/DOP and L2LP). That is, for the older speakers, who already have an elaborate corpus of linguistic experience, it takes more exemplars before the generalizations that are either stored (L2LP) or formed at decision time (ET/DOP) in this corpus can be changed. However, the indication of exemplar learning does not necessarily indicate that there is no abstract knowledge available in the brain (ET/DOP). Even though the experiment may indicate exemplar *learning* (ET and L2LP), it does not necessarily imply that all linguistic processing occurs on an exemplar basis.

There is no suggestion of exemplar (ET) or abstraction based (GG, L2LP and L2UG) processing that emerges from this experiment. However, it seemed that every participant was familiar with the type of construction. One participant, a sixty-five year old male stated “Op commerciële zenders wordt dit soort verbasterd taalgebruik gebezigd⁸”, in which he explained that this kind of language is spoken on commercial television networks. The formulation that he uses shows a strong disapproval or even a condemnation of the sentence, but it does show

⁸ Translation: On commercial television broadcasting networks, this kind of language is exercised.

that he stored it and probably many other examples as well, as he seems to regard it as a category. More old generation participants wrote that they knew the type of construction and that they heard it often. This may be indicative of exemplar storing.

Conclusion

In the different chapters of this study evidence was put forward in favour and against the existence of abstraction in language processing. The first four chapters provided an extensive description of four different theories with different views on the role of abstractions and exemplars in the acquisition of first and second languages. The fifth chapter provided an extensive debate on the findings of the first four chapters and put forward a proposal, which was tested in the last chapter.

In Chapter 1, Generative Grammar, a theory that proposes that the knowledge of language seems to exist of highly abstract grammatical rules. The GG framework, assumes that these syntactic rules are the main unit of processing in the language competence and provides evidence for the existence of these linguistic abstractions.

As the complexity of these highly abstract syntactic rules are regarded as too complex to be acquired by a young infant, GG assumes that this knowledge is innate to the human mind in the form of a Universal Grammar (UG) component in the human brain that is responsible for the acquisition of language. This UG module, however, is only expected to be available for first language (L1) learning and not for second language (L2) learning.

Chapter 2 focussed on the role of instance-specific knowledge for the processing and acquisition of language. The exemplar view on language processing states that there is no need for abstract knowledge in order to account for linguistic processing. Exemplar Theory (ET) and Data-Oriented Parsing (DOP) regard the linguistic competence as a device that efficiently compares old and new data that is assumed to be stored in long-term memory. These theoretical frameworks thus do not assume storage of abstract knowledge but only storage of concrete knowledge. The ET/DOP approach found much evidence for this assumption, that the whole of linguistic data that is experienced in a lifetime is stored and for a matching mechanism that compares all the new data to the data that is already stored. The ET/DOP approach proposes that in a language mechanism as such, acquisition of L1 as well as L2, is a very simple process, namely the storing of linguistic data. ET and DOP thus regard language as learnable and not innate as is assumed by GG.

In Chapter 3, the Second Language Linguistic Processing (L2LP) model was presented, who also regards language as learnable. In contradiction to the ET/DOP approach, however, the

L2LP model assumes a role for abstract representations in the processing of language. The L2LP model provides an interesting model for L1 language acquisition, in which exemplar storing is seen as a means to acquire abstractions. In this approach exemplars are stored until enough information is stored to form a category or rule. As a result of this process, it is expected in the L2LP model that in the adult processing of language, there is a combination of different processing units with different levels of abstractions that all contribute to the interpretation of language.

The L2LP model assumes that for L2 learning, the grammar of the L1 will firstly interpret all the incoming data, however consistent exposure to the L2 will lead to a re-ranking of the constraints of the L1 grammar and if necessary there will be exemplar storing in order to acquire new categories and rules.

Chapter 4 described the Second Language and Universal Grammar proposal, which emphasized that there is a continuity between L1 and L2 acquisition. The L2UG framework agrees with Chomsky on the assumption that language consists of highly abstract syntactic rules, however, L2UG emphasizes that the same acquisition process seems to take place for L2 learning as was proposed for L1 learning by GG.

In Chapter 5 all the evidence that was put forward by the different frameworks was critically compared and discussed. In this discussion, it was argued that all this evidence does not necessarily exclude each other. In cognitive psychology it is assumed that the knowledge of concepts and categories is represented by abstract as well as exemplar knowledge. The theoretical framework of Construction Grammar (CG) argues that linguistic processing is part of the whole of conceptual knowledge in the human brain, and thus also for linguistic processing both exemplar and abstract knowledge is represented. CG argues that L1 as well as L2 acquisition is not driven by innate language principles, but can be acquired by the storage of exemplars and the induction of abstract information from these exemplars. This process continues throughout life: every newly stored exemplar may be of influence to the conceptual knowledge of a category.

This framework seems to advocate an interesting view on the role of exemplar and abstract knowledge in linguistic processing and acquisition. This view seems to be supported by the evidence that GG found for abstract syntactic rules in Chapter 1, the evidence that ET/DOP provided for concrete exemplar storage in Chapter 2, the evidence for exemplar learning that

L2LP put forward in Chapter 3 and evidence for the continuity between first and second language learning that was suggested by L2UG in Chapter 4.

However one point of criticism was put forward in the discussion in Chapter 5, namely that in CG it is assumed that the formation of linguistic abstractions is driven by the human desire to speak and to be understood. It was argued that when this is the main force behind linguistic processing it is very difficult to explain why there seems to be so much variety and change in a language community. Therefore a different motive behind the formation of abstractions was proposed, namely the desire to store efficiently. In the here proposed model it was argued that there are two competing motivations that are related to the processing of language, namely storage and efficiency. On the one hand, the human mind desires to store everything that is encountered in a lifetime, on the one hand another motivation is trying to make this storage more efficient by replacing redundant information by an abstract representation. If the functions of exemplar and abstract storage are seen in this way, it becomes more plausible why there is inconsistency in knowledge of language among speakers of the same language. This idea was put through the test in Chapter 6.

Chapter 6 was an experiment that tried to show an example of reanalysis in Dutch, by which it was tried to confirm that different speakers of a language may have different knowledge of their language. Different knowledge was indicated by the fact that different speakers may have different judgments on what is grammatical in their language.

Participants were presented with a structure that is frequently heard, but is officially ungrammatical according to the grammar of Dutch, the ANS. It was asked if they found this sentence grammatical and afterwards it was also asked if they found the sentence that the ANS recommends as grammatical or worse than the previous sentence, which was ungrammatical. It turned out that the speakers that participated in the experiment had very different opinions about this. Older speakers of Dutch regarded the old form as grammatical and the new form as ungrammatical. The majority of younger speakers of Dutch regarded both sentence types as grammatical, however it turned out that women preferred the new form, which is officially ungrammatical, above the old form, which is officially grammatical. Men, on the other hand, regarded both sentences grammatical, but preferred the old form above the new.

The results of the experiment may be seen as support for the CG model that was proposed in the discussion in Chapter 5. As was suggested by the CG framework, exemplars as well as

abstractions play an important role in language processing. The consistent hearing of a new form, may lead to a change of the abstract concept that is represented in long-term memory, even after an abstraction is formed. And as the memory of older people is more extensive it is more difficult to change the abstract knowledge that represents the stored exemplars, which, as was mentioned above, was observed in the results of the experiment. This storing of exemplars still takes place when the language user is in the 'steady state' of language experience, which suggests a continuity of L1 and L2, or post-L1 learning, as far as there is a steady state of language experience.

The results of the experiment of Chapter 6 also indicates that different speakers of a language have different knowledge of their language. Variety of knowledge of language is of no advantage to mutual understanding between different speakers. The occurrence of reanalysis may thus be indicative that linguistic processing may not be driven by a desire to be understood, but by non-linguistic motivations, such as the competing motivations of storage and efficiency, as were proposed in the discussion in Chapter 5.

Appendix 1. Questionnaire

Mijn naam is Anne-Marieke Samson en ik ben student Taalwetenschap en ben op dit moment mijn scriptie aan het schrijven.

Ik ben op zoek naar sprekers van het Nederlands van boven de 40 jaar voor een klein onderzoekje. Meedoen aan dit onderzoek houdt alleen het invullen van onderstaande vragen in. Dit neemt slechts een paar minuten in beslag.

Uw deelname aan het onderzoek is anoniem, echter ik wil graag uw leeftijd weten en of u een man of een vrouw bent. Alle informatie die u mij levert, wordt uiterst discreet in mijn scriptie gebruikt.

U kunt uw antwoorden op mijn vragen sturen naar amsamson@gmail.com

Belangrijk is om bij het invullen van de vragen niet te overleggen met anderen, het gaat om uw eigen idee.

Bij voorbaat dank!
Met vriendelijke groet,

Anne-Marieke Samson

Ik wil graag weten

1. Of u de zinnen onder **a** en **b** correct, incorrect of acceptabel vindt.

A Hij wordt gevraagd om minister te worden.
Ik werd verzocht het gebouw onmiddellijk te verlaten.

B Hij wordt een boek voor zijn verjaardag gegeven.
Hij wordt de nieuwe collectie gepresenteerd.

2. En als u sommige daarvan eventueel niet acceptabel vindt, kunt u dan uitleggen waarom u dat vindt (los van wat het groene boekje erover zegt, het gaat om uw eigen idee)

3. Als laatste wil ik nog graag weten of u de zinnen onder c beter of slechter vindt dan onder a of dat u ze misschien evengoed vindt. En of u kunt uitleggen waarom u dat vindt.

C Hem wordt gevraagd om minister te worden
Mij werd verzocht het gebouw onmiddellijk te verlaten.

Uw Leeftijd:
Man / Vrouw

Appendix 2.

Results of reanalysis questionnaire

The following pieces of text are copied and pasted from the emails that were sent back to me by the participants. They are ordered by age of the participants. Also their gender is mentioned along with their age. Their responses were translated as literally as possible.

M 67:

a en b geen goed taalgebruik

“hem wordt gevraagd om minister te worden” en “mij werd verzocht het gebouw onmiddellijk te verlaten”

b. “hem wordt een boek voor zijn verjaardag gegeven” en “hem wordt de nieuwe collectie gepresenteerd”.

De zinnnetjes onder c zijn goed

Translation

A and b, incorrect use of language

“hem wordt gevraagd om minister te worden” and “mij werd verzocht het gebouw te verlaten”

“hem wordt een boek voor zijn verjaardag gegeven” en “hem wordt de nieuwe collectie gepresenteerd”.

The sentences under c are correct

M 65:

Wij vinden de zinnen onder a en b geen goed taalgebruik. Op commerciële zenders wordt dit soort verbasterd taalgebruik gebezigd

De zinnnetjes onder c zijn goed. Wij geven er de voorkeur aan in het eerste zinnnetje het woordje “om” nog weg te laten

Translation:

We regard the sentences under a and b as incorrect. On commercial television networks, this kind of incorrect language is exercised.

The sentences under c are correct. We prefer to leave out the word ‘om’ in the first sentence of c.

F 65:

a en b **geen** goed taalgebruik

“hem wordt gevraagd om minister te worden” en “mij werd verzocht het gebouw onmiddellijk te verlaten”

b. “hem wordt een boek voor zijn verjaardag gegeven” en “hem wordt de nieuwe collectie gepresenteerd”.

De zinnnetjes onder c zijn goed

Translation

A and b, incorrect use of language

“hem wordt gevraagd om minister te worden” and “mij werd verzocht het gebouw te verlaten”

“hem wordt een boek voor zijn verjaardag gegeven” en “hem wordt de nieuwe collectie gepresenteerd”.

The sentences under c are correct

F 63:

Wij vinden de zinnen onder a en b geen goed taalgebruik. Op commerciële zenders wordt dit soort verbasterd taalgebruik gebezigd

De zinnetjes onder c zijn goed. Wij geven er de voorkeur aan in het eerste zinnetje het woordje “om” nog weg te laten

Translation:

We regard the sentences under a and b as incorrect. On commercial television networks, this kind of incorrect language is use.

The sentences under c are correct. We prefer to leave out the word ‘om’ in the first sentence of c.

M 60:

- a. vind ik goed.
- b. vind ik niet goed. In beide zinnen zou ik hij door hem vervangen.
- c. c. vind ik beter als a. Ik kan niet goed aangeven waarom.

Translation:

- a. is correct
- b. is not correct, in both sentences hij should be replaced by hem
- c. c is better than a. I cannot explain clearly why.

F 59:

Voor mij is in eerste instantie a beter dan b, omdat in bij b het 'aan hem' wordt bedoeld en dan kan je volgens mij niet deze persoonsvorm gebruiken. Je hoort dit wel vaak zo zeggen in Amsterdam, waarom weet ik niet.

c kan dan weer wel om dezelfde reden.

Translation:

For me, in the first place a is better than b, because in b it is meant to be ‘to him’ instead of ‘hij’ en in that case you cannot use this form of the pronoun. However, sentences like this are often heard in Amsterdam, I don’t know why.

C is correct for the same reason.

F 59:

Zinnen A vind ik acceptabel, ik zou denk ik "om" weg laten in de eerste zin.

Zinnen B zijn voor mij niet acceptabel, ik zou het zo zeggen: Hij krijgt een boek voor zijn verjaardag.

De nieuwe collectie wordt aan hem gepresenteerd.

De zinnen C lopen voor mij beter, waarom weet ik ook niet zo, dit is puur gevoel.

Translation:

Sentences A I find acceptable, I would leave “om” (to) out, however.

Sentences B, are not acceptabel, I woud say it like this: Hij krijgt een boek voor zijn verjaardag (active construction, instead of passive)

The sentences of C are better, I don't know why it is purely a feeling

F 57:

a acceptabel

b werkwoord verkeerd gekozen maar niet met persoon maar onderwerp beginnen lijkt mij prettiger lezen.

C, Het kan wel maar het is gewoon niet mooi geformuleerd.

Translation:

A is acceptable

B, wrong verb is chosen. if the sentence doesn't start with person but with subject, it is better reading it.

C, is possible but not well formulated

M 54:

a is OK

B, kan echt niet. Dit moet iets zijn van "Hij krijgt" of "hij heeft gekregen". Misschien komt het omdat er een directere uitdrukking mogelijk is.

B2, Lelijk. Kan beter dan de eerste in mijn ogen. Wat volgens mij wel kan: de nieuwe collectie wordt hem gepresenteerd.

Ook kan er weer een zin met krijgen.

Ik zit te zoeken in de verklaring van de "belangrijkste informatie": dit gaat over de nieuwe collectie en de vorige zin over "het boek aan hem".

A1 is beter than c1 volgens mijn gebruik van taal

C2 is beter. Ik ben eigenlijk niet het onderwerp en dat blijkt beter uit deze zin

Translation:

a is ok.

B1, is unacceptable. This should be something like: "hij krijgt" (untranslatable, but it is an active form of the passive 'he is given') Maybe because a more direct is expression possible.

B2, Ugly. However is more acceptable than the first one. What is actually possible: the new collection is presented to him. Or a sentence with 'krijgen' (again untranslatable)

I am trying to find a solution similar to "the most important information": This sentence is about the new collection and the previous sentence about 'the book to him'.

A1 is better than c1 according to my use of language

C2 is better (than A1). 'Ik' (I) is not the subject and that is better expressed in c.

M 52:

a en b **geen** goed taalgebruik

"hem wordt gevraagd om minister te worden" en "mij werd verzocht het gebouw onmiddellijk te verlaten"

b. "hem wordt een boek voor zijn verjaardag gegeven" en "hem wordt de nieuwe collectie gepresenteerd".

De zinnestjes onder c zijn goed

Translation

A and b, incorrect use of language

“hem wordt gevraagd om minister te worden” and “mij werd verzocht het gebouw te verlaten”

“hem wordt een boek voor zijn verjaardag gegeven” en “hem wordt de nieuwe collectie gepresenteerd”.

The sentences under c are correct

F 47:

A en B, Niet acceptabel, het zijn alle meewerkende voorwerpen: Aan hem wordt gevraagd , aan mij werd verzocht (b) aan hem wordt gegeven en aan hem wordt gepresenteerd.

C: Dit zijn correcte zinnen, zoals ik al opmerkte gaat het om meewerkend voorwerp en niet om een onderwerp, de c-zinnen zijn dus goed, de andere niet

Translation:

A and B, not acceptable, they are all indirect objects: Aan hem wordt gevraagd , aan mij werd verzocht (b) aan hem wordt gegeven en aan hem wordt gepresenteerd.

C: these are correct sentences, as I mentioned before, they are indirect objects and not subjects, the c-sentences are correct and the others are not.

F 30:

a acceptabel

b niet

ik vind dit beter klinken:

hem wordt een boek voor zijn verjaardag gegeven.

ik zou zeggen;

hij krijgt een boek voor zijn verjaardag

ik vind dit beter klinken:

hem wordt de nieuwe collectie gepresenteerd

ik zou zeggen;

de nieuwe collectie wordt aan hem gepresenteerd

Ik vind de zinnen onder a beter klinken dan c. Zelfstandiger, meer een hele zin.

De zinnen onder c lijken uit een andere zin gehaald alsof er iets aan vooraf hoort te gaan.

Translation:

A, acceptable

B, not

I think this sounds better:

‘hem wordt een boek voor zijn verjaardag gegeven’

I would say:

‘hij krijgt een boek voor zijn verjaardag’

I think this sounds better:

‘hem wordt de nieuwe collectie gepresenteerd’

I would say:

‘de nieuwe collectie wordt aan hem gepresenteerd’

I think the sentences of a sound better than c. More independent; more a complete sentence.

De sentences under c appear to be taken from another sentence, as if something should precede them.

M 30:

- a regel 1 onacceptabel vooral als het om een minister gaat (**hem** wordt ...)
- a regel 2 acceptabel maar niet correct (**mij** werd verzocht)
- b onacceptabel (klink engels)
- c zijn goed (en volgens mij strookt mijn intuïtie hier met het groene boekje)

Translation:

- a1, unacceptable, especially when it is about a minister (hem wordt)
- a2, acceptable but incorrect (mij werd verzocht)
- b unacceptable (sounds english)
- c, are correct (I think my intuition is not in accordance with 'het groene boekje' (grammar book))

M 28:

De zinnen onder B vind ik beide niet acceptabel: het voelt alsof er 'aan hem' moet staan. Waarom ik de zinnen niet acceptabel vind, kan ik niet precies zeggen. Ik heb het idee dat het met naamvallen te maken heeft. Ik vind de zinnen A1 en C1 even goed, het zou voor mij als moedertaalspreker van de context afhangen welke variant ik zou gebruiken. Zin A2 vind ik beter dan C2. In C2 heb ik het idee dat er iets moet komen als 'mij werd verzocht mijn spullen op te ruimen'. Maar waarom dat nu anders is dan een gebouw verlaten...

Translation:

The sentences under B are both not acceptable: it feels like they should say 'to him' instead of 'he'. Why I find the sentences not acceptable is hard to say. I have the idea that it has to do with cases. I find the sentences A1 and C1 evenly acceptable; for me as a native speaker it would depend on the context which one I would use. Sentence A2 I find better than C2. In C2 I have the idea that something like 'to clean up your room' should follow instead of 'to leave the building'. But why that is different than a leaving a building..

M 28:

Intuïtief vind ik beide de zinnen bij a acceptabel. De zinnen bij b geven mij op het eerste gezicht een raar gevoel, en iets later besef ik dat dat is omdat ik voel dat in beide zinnen "hem" had moeten staan in plaats van "hij". Ook in de zeer informele spreektaal zou ik de bovenstaande zinnen vreemd vinden, Ik vind de zinnen bij c even goed als bij a, maar zij hebben voor mij een andere betekenis. Grammaticaal vind ik a en c even goed.

Translation:

Intuitively, I find both sentences of a acceptable. The sentences of b, feel strange at first, later I realized that it is because I think in both sentences it should have been 'hem' (him) instead of 'hij' (he). Also in informal language, the b-sentences would sound strange.

The sentences of c, are just as grammatical as the ones of a, although for me they have different meanings.

F 28:

A= correct

De zinnen onder B liggen mij niet lekker in de mond. Naar mijn gevoel kunnen deze zinnen niet gekoppeld worden aan een persoon omdat het onderwerp van de zin niet geen subject is, maar een object. Eerder zou ik het woord 'hij' vervangen door 'Er' in de 1e zin. Bij de tweede zin zou ik het helemaal omgooien 'De nieuwe collectie wordt gepresteerd'.

Ik vind de zinnen onder c niet acceptabel, ze lopen niet. Wederom zou ik het woord 'er' introduceren binnen de zinnen. 'Er wordt hem gevraagd om minister te worden' en 'Er werd mij verzocht het gebouw onmiddellijk te verlaten'. Volgens mij heeft het ook te maken met de handeling binnen de zin. Door wie wordt de handeling in gang gezet? In beide zinnen ontbreekt een verwijzing daarnaar. 'Er' impliceert in ieder geval een actieve aanzet tot de zin. Een verwijzing naar de daad ofzo...

Translation:

A = correct

De sentences of B sound very strange. In my opinion these sentences cannot be attached to a person, because the subject of the sentence is actually not a subject, but an object. It would be better to replace 'hij' with 'er' (there) in the first sentence. In the second sentence I would change the word order 'de nieuwe collectie wordt gepresenteerd' (the new collection is presented)

I find the sentences of C unacceptable, they are strange. Again I would introduce the word 'er' 'er wordt hem gevraagd om minister te worden' en 'er werd mij verzocht het gebouw onmiddellijk te verlaten'. In my opinion it also has to do with the verb of the sentence. By who is the act initiated? In both sentences it lacks a reference to this actor. If the word 'er' is used, it implies an active initiative, a reference to a deed, or something...

M 27:

Ik vind de zinnen onder a en b niet acceptabel, waarbij ik de zinnen onder b volstrekt belachelijk vind klinken, en die onder a wel vaker hoor, volgens mij.

Maar in allebei de zinnen is 'hij' het meewerkend voorwerp, en dat zou volgens mij met 'hem' moeten worden aangeduid.

De zin is eigenlijk 'Aan hem wordt iets gegeven of gevraagd', en in die zin past 'hij' helemaal niet op de plek van 'hem'.

Maar de zinnen onder a) vind ik dus veel normaler dan die onder b). De zinnen onder c) zijn volgens mij correct, alleen mist er een 'd' in 'gevraag'.

Translation:

I find the sentences of a and b both not acceptable, whereas I find the sentences of B absolutely ridiculous and the sentences of a I have often heard say.

However, in both examples 'hij' is actually the recipient (meewerkend voorwerp) en this ought to be expressed by 'him'.

However, the a-sentences sound more normale than the ones of b.

The sentences of c are correct in my opinion.

M 26:

A is prima

B klopt niet:

ik mis het woordje 'aan'

hij zou moeten zijn 'aan hem'

C kan, maar is wel slordig: A is beter

Translation:

A is fine.

B is strange

I miss the word 'aan' (to), it should be 'aan hem' (to him)

C is possible but is not correct: A is better.

M 25:

A, ja

B1, ja maar niet heel netjes

B2, nee

C, Slechter dan a. Ik vind deze zinnen een beetje contextloos doordat ze geen onderwerp hebben.. De scope van de zin is groter dan de informatie die er in zit en daardoor vaag. Evt in een complete alinea met context zou ik het er meer mee eens zijn.

Translation:

A, yes

B1, yes, but strange

B2, no

C, worse than a. These sentences sound a little contextless because they don't have a subject.

The scope of these sentences is larger than the information that is in them and therefore they are vague. In a complete paragraph with context I might find them more acceptable.

M 25:

Ik vind eigenlijk geen van alle zinnen acceptabel. Volgens mij moeten de werkwoorden allemaal wederkerend gebruikt worden (dat is toch de term?), dus: hem...;me...; hem...; hem...

Translation:

I think none of the sentences (a, b and c) is acceptable. In my opinion, the verbs should all be used reciprocal (isn't that the term?) So, instead of 'hij' (he) and 'ik' (I) it must always be 'hem' (him) and 'me' (me).

F 24:

de zinnen onder a zijn acceptabel. met name de tweede zin. bij de eerste zin twijfel ik of het acceptabel is omdat " hem" beter zou staan voor mijn gevoel.

de zinnen onder b zijn voor mijn gevoel niet acceptabel omdat er zou moeten staan " (aan)hem" in plaats van "hij".

ik zou dus c beter vinden voor de eerste zin van a.

Translation:

The sentences under a are acceptable. Especially the second sentence. I have doubts about the first sentence, because 'him' would have been better, I think.

The sentences under b, are not acceptable because they should have had '(aan) hem' (to him) instead of 'hij'

I would prefer sentence C1 above A1.

F 24:

A is acceptabel

Beide zinnen onder B klinken raar. Het 'hij' als onderwerp past niet. Naar mijn idee is het alleen correct als het een indirect object zou zijn, 'aan hem'. Maar zoals nu in B zou ik de zinnen nooit gebruiken, en als ik het zou horen zeggen, zou ik er waarschijnlijk een grapje over maken.

C1: SLECHTER: intuïtief vind ik het raar klinken als 'hem' wordt gebruikt als zogenaamd onderwerp van een zin, zeker als het zo aan het begin van de zin staat.

C2: EVENGOED: wat er bij 'hem' wel is vind ik bij 'mij' niet. Ik denk omdat je 'mij' zelf vaker gebruikt, maar dat is ook maar weer een instinctief idee. Beide zinnen, dus die in A en in C klinken naar mijn idee goed, maar ik denk dat ik de zin in C niet zelf zou gebruiken, omdat het toch wat gek klinkt om een zin te beginnen met 'mij' als zogenaamd onderwerp.

A is Correct

Translation:

Both sentences of B sound strange. 'hij' as a subject is incorrect. In my opinion it would only have been correct if it had been an indirect object 'aan hem'. But as they are now I would never use those sentences and if I heard someone say them, I would make a joke about it.

C1: even worse! Intuitively it sounds strange if 'hem' is used as a subject of the sentence, especially if it is in initial position like this.

C2: evenly well. What I think of 'hem' is not the same for 'mij'. Maybe because you use 'mij' more often yourself, but that is only an instinctive thought. Both sentences, A and C sound good, but I think I would not use the sentence in C, because it sounds strange to me to start a sentence with 'mij' as a so-called subject.

F 24:

De eerste zin van a lijkt mij grammaticaal in orde. Alleen is de zinsopbouw in dit geval niet zo gepast. Twijfel over nut van 'om'. 'Hij wordt' in combinatie met 'worden'. 'Hij wordt' in plaats van 'Hem'?

De tweede zin van a lijkt in eerste instantie goed, na tien keer te hebben gelezen slaat de twijfel toch toe;

'Ik' moet vervangen worden door 'Mij'.

C, Veel beter, voor uitleg zie vraag 2

Translation:

The first sentence of a seems grammatical to me. Only the sentence construction is a bit inappropriate. I doubt about the use of 'om' (to). 'hij wordt' in combination to 'worden'. 'hij wordt' instead of 'hem'?

De second sentence of a at first seems alright, after ten readings I start doubting; 'ik' must be replaced by 'mij'

C, much better, see explanation of sentence 2.

F 24:

A vind ik lelijk, maar niet onjuist

B beide zeker niet juist

C1 vind ik nog net zo lelijk, maar ook nog steeds juist.

C2 juist

Translation:

A, I find ugly but not incorrect

B definitely incorrect

C1, just as ugly, but still correct

C2 correct

Appendix 3

Tables of results of questionnaire.

The below presented tables are a results of the answers of the participants as presented in appendix 2.

Table 1.1 Results of question 1, sorted by age

Age, gender ↓ Sent →	A1	A2	B1	B2
67, m	Unacceptable	Unacceptable	Unacceptable	Unacceptable
65, f	Unacceptable	Unacceptable	Unacceptable	Unacceptable
65, m	Unacceptable	Unacceptable	Unacceptable	Unacceptable
63, f	Unacceptable	Unacceptable	Unacceptable	Unacceptable
60, m	Correct	Correct	Unacceptable	Unacceptable
59, f	Correct	Correct	Unacceptable	Unacceptable
59, f	Acceptable, but strange	Acceptable, but strange	Unacceptable	Unacceptable
57, f	Correct	Correct	Unacceptable	Unacceptable
56, f	Acceptable, but strange	Acceptable, but strange	Unacceptable	Unacceptable
54, m	Correct	Correct	Unacceptable	Unacceptable
52, m	Unacceptable	Unacceptable	Unacceptable	Unacceptable
47, f	Unacceptable	Unacceptable	Unacceptable	Unacceptable
30, f	Correct	Correct	Unacceptable	Unacceptable
30, m	Unacceptable	Acceptable but strange	Unacceptable	Unacceptable
28, m	Correct	Correct	Unacceptable	Unacceptable
28, m	Correct	Correct	Unacceptable	Unacceptable
28, f	Correct	Correct	Unacceptable	Unacceptable
27, m	Unacceptable	Unacceptable	Unacceptable	Unacceptable
26, m	Correct	Correct	Unacceptable	Unacceptable
25, m	Unacceptable	Unacceptable	Unacceptable	Unacceptable
25, m	Correct	Correct	Acceptable but strange	Unacceptable
24, f	Acceptable, but strange	Correct	Unacceptable	Unacceptable
24, f	Correct	Correct	Unacceptable	Unacceptable
24 f	Correct	Acceptable but strange	Unacceptable	Unacceptable

Table 1.1a Results of question 3 sorted by age

Age, gender ↓ Sent →	C1		C2	
67, m	Correct	better than A	Correct	better than A
65, f	Correct	better than A	Correct	better than A
65, m	Correct	better than A	Correct	better than A
63, f	Correct	better than A	Correct	better than A
60, m	Correct	better than A	Correct	better than A
59, f	Correct	better than A	correct	better than A
59, f	Correct	better than A	Correct	better than A
57, f	Acceptable, but strange	Worse than A	Acceptable, but strange	Worse than A
56, f	Correct	better than A	Correct	better than A
54, m	Unacceptable	Worse than A	Correct	equal to A
52, m	Correct	better than A	Correct	better than A
47, f	Correct	better than A	Correct	better than A
30, f	Unacceptable	Worse than A	Unacceptable	Worse than A
30, m	Correct	better than A	Correct	better than A
28, m	Correct	equal to A	Acceptable, but strange	equal to A
28, m	Correct	equal to A	Correct	equal to A
28, f	Unacceptable	Worse than A	Unacceptable	Worse than A
27, m	Correct	better than A	Correct	better than A
26, m	Acceptable, but strange	Worse than A	Acceptable but strange	Worse than A
25, m	Correct	Worse than A	Correct	Worse than A
25, m	Unacceptable	equal to A	Unacceptable	equal to A
24, f	Correct	better than A	Correct	better than A
24, f	Unacceptable	Worse than A	Acceptable, but strange	Worse than A
24 f	Correct	better than A	Correct	equal to A

Table 1.2 Results of question 1, sorted by gender for participants under 40

gender, age ↓ Sent. →	A1	A2	B1	B2
F 30	Correct	Correct	Unacceptable	Unacceptable
F 28	Correct	Correct	Unacceptable	Unacceptable
F 24	Acceptable, but strange	Correct	Unacceptable	Unacceptable
F 24	Correct	Correct	Unacceptable	Unacceptable
F 24	Correct	Acceptable but strange	Unacceptable	Unacceptable
M 30	Unacceptable	Acceptable but strange	Unacceptable	Unacceptable
M 28	Correct	Correct	Unacceptable	Unacceptable
M 28	Correct	Correct	Unacceptable	Unacceptable
M 27	Unacceptable	Unacceptable	Unacceptable	Unacceptable
M 26	Correct	Correct	Unacceptable	Unacceptable
M 25	Unacceptable	Unacceptable	Unacceptable	Unacceptable
M 25	Correct	Correct	Acceptable but strange	Unacceptable

Table 1.2a Results of question 3, sorted by gender for participants under forty

Age, gender ↓ Sent →	C1		C2	
30, m	Correct	better than A	Correct	better than A
28, m	Correct	equal to A	Acceptable, but strange	equal to A
28, m	Correct	equal to A	Correct	equal to A
27, m	Correct	better than A	Correct	better than A
26, m	Acceptable, but strange	Worse than A	Acceptable but strange	Worse than A
25, m	Correct	Worse than A	Correct	Worse than A
25, m	Unacceptable	equal to A	Unacceptable	equal to A
30, f	Unacceptable	Worse than A	Unacceptable	Worse than A
28, f	Unacceptable	Worse than A	Unacceptable	Worse than A
24, f	Correct	better than A	Correct	better than A
24, f	Unacceptable	Worse than A	Acceptable, but strange	Worse than A
24 f	Correct	better than A	Correct	equal to A

Bibliography

Aitchison, Jean

2000 “Language Change, Progress or Decay?”. Cambridge University Press, Cambridge (2000).

Archangeli, Diana

1997 “Optimality Theory. An overview.” Blackwell publishers, Malden Massachusetts, Oxford.

Bod, Rens

1992 “A computational model of language performance: Data Oriented Parsing”. In: Actes de Coling-92, Nantes 23-28 Aout 1992, pp 855-859

Boersma Paul, Escudero Paola, Hayes Rachel

2003 “Learning Abstract Phonological from Auditory Phonetic Categories: An Integrated Model for the Acquisition of Language-Specific Sound Categories”, In: Proceedings of the 15th International Congress of Phonetic Sciences, Barcelona, August 3 – 9, 2003 pp, 1013-1016

Botha, Rudolph P.

1989 “Challenging Chomsky. The generative garden game.” Blackwell, Oxford UK & Cambridge USA (1989)

Chomsky, Noam

1986 “Knowledge of Language. Its Nature, Origin and Use.” Praeger, New York, Westport, Connecticut, London (1986)

1971 Summary of oral presentation, taken from: “Symposium on innate ideas” in J. Searle (ed), The philosophy of Language, pp 121-144 Oxford University press, Oxford (1971)

1965 “Aspects of the theory of syntax.” The M.I.T Press. Massachussets Institute of technology. Cambridge Massachussets (1966)

1957 “Syntactic structures” Mouton de Gruyter. Berlin, New York (2002)

Clahsen Harald, Sonnenstuhl Ingrid, Blevins James P.

2002 “Derivational Morphology in the German Mental Lexicon: A Dual Mechanism Account” In In: H. Baayen & R. Schreuder (eds.), Morphological structure in language processing. Berlin: Mouton de Gruyter p 125-155.

Coppen P.A., Haeserijn W. & de Vriend F.

- 2004 Electronische Algemene Nederlandse Spraakkunst, found online at:
<http://oase.uci.kun.nl/~ans/>
- Ellis, Nick C.
- 2002 “Frequency effects in language processing. A Review with Implications for Theories of Implicit and Explicit Language Acquisition”, In: *SSLA*, volume 24, pp 143-188
- Escudero, Paola
- 2005 “Linguistic perception and second language acquisition. Explaining the attainment of optimal phonological categorization”, LOT Dissertation Series 113, Netherlands Graduate School of Linguistics (2005)
- Escudero Paola, Boersma Paul
- 2003 “Bridging the gap between L2 speech perception research and phonological theory.” In *SSLA*, volume 26, 551-585
- Goldberg, Adele
- 2006 “Constructions at work. The nature of generalizations in language.” Oxford University Press (2006)
- Goldinger, William
- 1997 “Words and Voices: Perception and Production in an Episodic Lexicon”, In Johnsn & Mullenix (eds) *Talker Variability in Speech Processing*. Academic Press, San Diego (1997) p 33-66
- Johnson, Keith
- 2005 “Speaker normalization in speech perception”, In Pisoni, D.B. & Remez, R. (eds) *The Handbook of Speech Perception*. Oxford: Blackwell Publishers. pp. 363-389.
- 1997 “Speech Perception without Speaker Normalization. An exemplar model”, In Johnsn & Mullenix (eds) *Talker Variability in Speech Processing*. Academic Press, San Diego (1997) p 145-166
- Leezenberg Michiel, Vries Gerard de
- 2001 “Wetenschapsfilosofie voor geesteswetenschappen” Amsterdam University Press (2001)
- Legato, Marianne J.
- 2005 “Why men never remember and women never forget”, Rodale 2005.
- Maye, Jessica, Gerken Lou-Ann, Werker, Janet
- 2002 “Infant sensitivity to distributional information can effect phonetic discrimination” In: *Cognition*, volume 82 (2002), pp B101-B111

Newmeyer, Frederick J.

1998 "Language Form and Language Function", The MIT Press, Cambridge, Massachusetts (1998)

Nosofsky, Robert M

1988 "Exemplar-based accounts of relations between classification, recognition and typicality" In: Journal of Experimental Psychology. Learning, memory and cognition. Volume 14, nr 4, pp 700-708

Peterson G.L., Barney H.L

1952 "Control Methods used in a study of the vowels" In: Journal of Acoustic Society of America, 1952 pp 175 - 184

Pierrehumbert, Janet B

2003 "Phonetic diversity, Statistical Learning and acquisition of Phonology", In: Language and Speech 2003, volume 46 (2-3) pp 115-154

Philippa, Marlies

1999 "Etymologie", Sdu, Den Haag, p37

Pisoni, David B.

1997 "Some thoughts on "Normalization" in Speech Perception", In Johnosn & Mullenix (eds) Talker Variability in Speech Processing. Academic Press, San Diego (1997) p 9-32

Ross Brian H., Makin Valerie S.

1999 "Prototype versus Exemplar Models in Cognition." In: "The Nature of Cognition", Robert J Sternberg (editor), The MIT press, Massachusetts (1999) pp 205-241

Scha, Remko

1990 "Language Theory and Language Technology; Competence and Performance. Originally published in Dutch in: R. de Kort and G.L.J. Leerdam (eds.): Computertoepassingen in de Neerlandistiek. Almere: LVVN, 1990, pp. 7-22. English translation found on: <http://iaaa.nl/rs/LeerdamE.html>

1992 "Virtual Grammars and Creative Algorithms" Originally published in Dutch in: Gramma/TTT, volume 1, 1, pp 57-77. English translation found on: <http://iaaa.nl/rs/inaugureE.html>

Spalding, Thomas L, & Ross, Brian H.

1994 "Comparison-Based Learning: Effects of Comparing Instances During Category Learning." In: Journal of Experimental Psychology: Learning, Memory and Cognition volume 20 (1994), no 6, pp 1251-1263

- Speck Oliver, Ernst Thomas, Kraun Jochen, Koch Christoph, Miller Eric, Chang Linda
2000 “Gender differences in the functional organization of the brain for working memory”,
found on neuroreport.com
- Stroop, Jan
1998 “Poldernederlands. Waardoor het ABN verdwijnt”, Uitgeverij Bert Bakker,
Amsterdam (1998)
- Tomasello, Michael
2001 “The acquisition of finite complement clauses. A corpus based analysis” In: cognitive
Linguistics, volume 12-2 (2001), pp 97-141
2000 “Do young children have adult syntactic competence?”, In: Cognition, volume 74
(2000), pp 209-253
- White, Lydia
2003 “Second language acquisition and Universal Grammar.” P. Austin, J. Bresnan, et all
(eds), Cambridge University Press, Cambridge (2003)
2000 “Second Language Acquisition: From Initial to Final State” In: Second Language
Acquisition and Linguistic Theory. John Archibald (eds), Blackwell Publishers Ltd,
Massachusetts USA (2000)
1989 “Universal Grammar and Second Language Acquisition. Volume 1” Harald Clahsen,
William Rutherford (eds), John Benjamins Publishing company
Amsterdam/Philadelphia 1989