FIRST LANGUAGE ATTRITION AND SYNTACTIC SUBJECTS

A study of Serbian, Croatian, and Bosnian intermediate and advanced speakers of Dutch

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I have read and understood The University of Edinburgh guidelines on Plagiarism and declare that this dissertation is all my own work except where I indicate otherwise by proper use of quotes and references.

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Abstract

This dissertation investigates the nature of second language induced first language attrition in the distribution and interpretation of overt and postverbal subjects in Serbian/Croatian/Bosnian (S/C/B).

Data are collected from two groups of native speakers of S/C/B who have immigrated to the Netherlands, and compared to data from monolingual speakers of S/C/B. At the time of the data collection, the participants in the first group had been living in the Netherlands for more than 12 years, whereas the participants in the second group arrived in the five years prior to the study. Both groups work and live in a Dutch language environment.

The results show that the group that has been in the Netherlands for a shorter period of time and has lower proficiency in Dutch differs most from the monolingual group. Furthermore, in the group that has been in the Netherlands for a longer period of time, the production of preverbal subjects appears to be affected by attrition (i.e. shows an increase), whereas interpretation of preverbal and postverbal, and overt and null subjects shows no effect.

The findings are discussed within a range of linguistic theories.

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1. Introduction

Many linguistic studies address the differences between the acquisition and ultimate attainment of the linguistic system of a native speaker and that of a second language learner. Their findings have shown that the latter are unlikely to attain the exact same state as the native speakers, due to the persistent influence of the learners' first language (L1) on the second language (L2) (Schwartz & Sprouse, 1994; Ritchie & Bhatia, 1996; Sorace, 2000a). However, much less research focused on the possibility of the opposite effect, attrition. Attrition is generally thought of as change within a language spoken by an individual, due to the effect of another language spoken by the same individual. The term "attrition" implies the beginning of the process of language loss, and its replacement by another (Myers-Scotton, 2006). Although, there are many cases of speakers who are no longer able to speak the second language they acquired at an earlier stage in life, studies in attrition generally focus on the changes that occur in the L1. The acquisition of an L2 is interesting in the sense that it differs from first language acquisition, as there is a first language influencing the second. However, the same can be possibly argued for the acquisition of a second language – it is likely that the second language will influence the native language. There is now a body of research that indicates that a fully acquired language system (i.e., adult language system) can be modified by the acquisition of another language. The possibility of modifying or altering a native language system poses some serious questions about the nature of 'the language faculty' (Hauser, Chomsky & Fitch, 2002). What aspects of language are most susceptible to this modification and what does this phenomenon tell us about the nature of language and human language capacity in general?

Several studies have approached this question from a number of perspectives and have proposed different explanations for the 'how and why' of attrition in a variety of circumstances, some of which are reviewed below. The majority of research on attrition has dealt with migrant communities, which were usually characterised by diminished use of the L1, separation from the L1-speaking community, and a low level of L2 attainment (Weltens, de Bot & van Els, 1986; Silva-Corvalan, 1991). The research put forward here focuses on syntactic attrition in a different group of subjects: adults who have reached an advanced proficiency in their L2 and speak it at work, with social contacts and even at home (in addition to their L1), but have continued to use their L1 on a regular basis, at home and/or with contacts in the country of their origin. Nevertheless, the L2 has become the language of the (speech) community they live in, and the language that is used during the larger part of their daily life. More specifically, in this study I focus on subjects who have migrated from the former republic of Yugoslavia, or from any of the

successor states, to the Netherlands, and therefore have Serbian/Croatian/Bosnian (S/C/B)[1] as their L1, and Dutch as their L2. The difference in the present study, when compared to other L1 attrition studies, is the inclusion of a complementary group. This group consists of participants with the same pair of L1-L2. However, the participants in this group arrived in the Netherlands more recently in comparison to the first experimental group. As such, these participants are therefore expected to behave in a different fashion from the long-term non-native residents.

S/C/B and Dutch, differ in many ways. While S/C/B is a South Slavic language, Dutch is a Germanic language. However, crucially for this study, S/C/B belongs to the category of pro-drop languages, whereas Dutch does not. In other words, S/C/B allows the drop of syntactic subjects (i.e. pro-drop, null subject) and subject inversion. In comparison, neither one of these structures is allowed in Dutch. There are several studies now that have dealt with pro-drop in first language attrition. The results of these studies show that the pro-drop feature is sensitive to attrition (Sorace, 2000b; Tsimpli et al. 2004; Gürel 2004; Jamshidiha & Marefat, 2006). These studies all involved participants with English as an L2. The present study aims to provide new insight into the phenomenon, as L1 S/C/B and L2 Dutch form a language set that has not been previously studied in this context.

The thesis is structured as followed. Chapter 2 deals with previous research on attrition, and a review of literature on null subjects and postverbal subjects. After an introduction to attrition, several theories that have been proposed to account for attritition are discussed in more or less chronological order. Then, null subjects will be discussed in order to get a better idea of the relevant structures in S/C/B and how these differ from Dutch. I will then present the motivation for this study together with the research questions. Chapter 3 describes the study, including hypotheses concerning the L1 attrition, and the details of the methodology. In chapter 4 the results of the experiment are presented. Chapter 5 places these results in context of the previous work discussed in chapter 2. Finally, I conclude the study with Chapter 6.

[1] The official name of the language spoken on the territory of Serbia, Montenegro, Croatia and Bosnia was Serbo-Croatian, before it split into Serbian, Croatian and Bosnian during the 1990s. This was also the official language used by the government and state broadcasting, and it is how most of the previous literature refers to it. Even in the literature that has appeared after the disintegration of the former republic some authors prefer to use that name (Paunović, 2000; Wechsler & Zlatić, 2000). Others talk about either Serbian, or Croatian or Bosnian, or alternatively choose to refer to it as Serbian/Bosnian/Croatian (Trenkić, 2004). With respect to null-subjects and postverbal subjects, the three languages behave in the same way. For this reason, and because the subjects in this study have precisely those three ethnical backgrounds, the term S/C/B has been chosen here.

2. First Language Attrition in Previous Research

2.1 L1 attrition in L2 environments

2.1.1 Introduction

For a long time, 'language loss' was only considered in a context of pathology, in which aphasia and other language disorders that were caused by tumors, strokes or head trauma played the major role. The topic of 'natural language attrition' (Van Els, 1986) as it is discussed in the present study did not surface until the late 1970's. In May 1980, a conference on 'Attrition of Language Skills' at the University of Pennsylvania was a turning point, and opened up a new field of research and lead to conferences that dealt with non-pathological language loss from many perspectives. Richard D. Lambert, who also was one of the organizers of the conference in 1980 and the co-editor of the following conference volume by Lambert and Freed (1982), was one of the first to address language loss that occurs frequently amongst multilinguals. Lambert and Freed's publication covered many aspects of first and second language attrition, and served as a stepping-stone for future research.

Another important development in the field of language attrition was Van Els' (1986) taxonomical framework for language attrition, which defines attrition in terms of *what* is lost and *which environment* it is lost in (see Table 2.1).

Table 2.1: Van Els' taxonomy for language attrition

Context	Example
loss of L1 in an L1-environment	aging, dialect loss
loss of L1 in an L2-environment	loss of native languages by migrant workers
loss of L2 in an L1-environment	foreign-language loss
loss of L2 in an L2 environment	second-language loss by aging migrants

For the purpose of this study, the focus of this review is on the second of these four forms of attrition. This category involves first language attrition in people who have moved to another country and use the societal language of that country on an everyday basis, while the extent to which the L1 is spoken is diminished. As a consequence, these people start showing instances of faulty application of their native language grammar. Hence, L1 attrition can be seen as an effect of acquiring another language. However, acquiring another language does not automatically trigger L1 attrition (Seliger, 1996). Routine use has been shown to reduce the likelihood of L1 attrition and is argued to be crucial for the continued ease of access to L1 and/or L2 (Obler & Hannigan, 1996), more so than the amount of formal education one has had in a certain language

(Daller & Grotjahn, 1999). Also, L1 attrition should not be thought of as a complete loss of a particular segment of L1 knowledge. In some cases where a language seemed completely forgotten and replaced by an L2, the 'forgotten' language has been shown to be continuingly present within the memory (Franco, 1999; Hansen, 2001). This means that even though certain elements of a language system might seem lost or altered, it does not necessarily mean that those linguistic elements cease to exist in the mental representation of that language. In other cases, the knowledge of an L2 has shown to lead to a greater competence in L1. Keskes & Papp (2000, as cited by Cook, 2003a) reported that Hungarian children that had knowledge of English produced more complex sentences than their monolingual peers. Furthermore, extensive research in the field of bilingual development has shown that children who use an L2 on regular basis have more precocious metalinguistic skills than monolingual children of the same age (Bialystok, 2001; Murphy and Pine, 2003)[2]. However, instead of positive or negative effects, the majority of the attested effects of the L2 on the L1 can only be called differences in the L1 system, as there is no real improvement or deterioration when using the L1 (Cook, 2003a). For instance, a study performed by Cook and colleagues, that focused on cues used to determine the subject of a sentence, showed that adult Japanese speakers of L2 English overused cues that are typically used in Japanese, when compared to monolingual speakers of Japanese. On the other hand, the same test showed that Greek and Spanish speakers of L2 English used the cues that were specific to their native language less than monolinguals did.

In summary, previous research shows that the knowledge of L2 causes the attriters to behave differently in their L1 when compared to monolingual speakers (Cook et al. 2003), which in many cases appears as a 'convergence or shift towards an L2 whereby attriters move away from L1 structures and approximate to L2 structures in some aspects of grammar' (Gürel, 2004: 54). In case of migrant communities, this attrition in first generation migrants is usually the beginning of the process of (minority) language change due to language contact, as the effect of attrition on first language speakers becomes more prominent and widespread among second language speakers of the heritage language (Montrul, 2004), and might even result in language death through population attrition (Bullock & Gerfen, 2004).

2.1.2 Linguistic Characteristics of Language Attrition

The available literature has shown that language attrition can occur in a range of aspects within the linguistic system, which includes the lexicon, phonology, and morpho-syntax (Seliger

[2] Importantly, these studies were all concerned with early bilinguals only, whereas the present study focuses on late bilinguals. The importance of this distinction is discussed more thoroughly in section 2.3

& Vago, 1991; Cook et al., 2003; Pavlenko, 2003). In both L1 attrition in an L1 and in an L2 speaking environment, lexical retrieval suffers the most from language attrition (for an overview, see Goral, 2004). In the case of L1 attrition in an L2 environment this usually results in code-mixing; words from the L2 are used to fill the gaps in the L1, often assimilated into the morphological system of the L1 (Seliger, 1996). This phenomenon is illustrated in the following example, which was uttered by an S/C/B L1 – Dutch L2 bilingual, who at that moment had lived in the Netherlands for over 30 years (for a full list of abbreviations, see Appendix A):

(1) *Časa mi je na kasjetu*
glass-NOM me is-PR-3SG on cabinet-LOC-SG
'My glass is on the cabinet.'

In this example, the lexeme "kastje" [3] from the L2 is extended with the S/C/B case-marker for locative, and provides a solution for the lack of immediate accessibility to "ormarić", the S/C/B word for 'cabinet.'

Attrition in phonology has been attested in several settings. In Flege's study (1987) on phonetic realtion, late French/English bilinguals used the same phonetic realisation rules for /t/ in both English and French. This results in a moderately aspirated stop, which differs from both L1 and L2 phonetic values. Attrition in the morpho-syntax of a bilinguals' L1 grammar has been documented in several domains. Pavlenko (2003) studied narratives of Russian L2 users of English. She found that these subjects deviated from monolingual speakers of Russian in that they made less clear distinctions between perfective/imperfective and determinate/indeterminate contexts. Also, their use of case marking appeared to be simplified when compared to that of monolinguals. Furthermore, a case study on an English speaker of Hebrew as an L2 by Seliger (1991) showed aspects of attrition in word order. The subject used Hebrew word order rules for the placement of a prepositional phrase with the English rules, or even replaced the English rules when judging English phrases for grammaticality. Attrition in word order has also been studied with concern to preverbal and postverbal subjects in Italian and Greek L2 speakers of English (Sorace, 2000b; Tsimpli et al. 2004). The participants in this study deviated from the monolingual control groups, as they used more preverbal subjects in contexts that would normally call for a postverbal subject. The same subjects were also used to study attrition in the pronominal system,

[3] In Dutch the /t/ in "kastje" is silent, this example does not exhibit assimilation to the phonological system of the L1. However, it does show epenthesis, as the penultimate /t/ in 'kasjetu' is inserted in between the final vowel of 'kastje' and the locative affix /u/.

which showed that they over generalized overt subjects where monolingual participants would use null subjects. In addition, the interpretation of overt subjects deviated from that of the monolingual control groups (Sorace, 2000b; Tsimpli et al. 2004). These last two phenomena will be discussed in more depth in section 2.4.6, as they are also the primary interest of the present study.

2.1.3 Performance vs. Competence

When conducting psycholinguistic research, it is important to maintain the distinction between competence and performance, in order to determine what a given example of language attrition is a manifestation of (Sharwood-Smith, 1983). Attrition at *competence* level implies a restructuring of L1 knowledge. Tasks that involve grammaticality judgment (or labeling tasks designed to test the interpretation of certain grammatical features) can reveal attrition at the competence level.

Attrition in *performance* does not imply a difference in linguistic knowledge, but in the way the knowledge is controlled. If people are subject to attrition in performance, they might deviate from non-attriters in their productions, while performing equally on the same type of linguistic items in grammaticality judgment tasks. In case of dominance shift in bilinguals' L1 and L2, Sharwood-Smith (1983) suggests that attrition occurs in three stages: *i)* systematic deviation in performance alone, while competence remains stable; *ii)* an intermediate stage where the bilingual is in possession of a new externally coordinated variety of his or her language, but is able to switch back to standard version of the language if needed; *iii)* the emergence of a new competence in which fewer structures are available than in stages *i* and *ii*.

2.2 Theories of L1 attrition in an L2 environment

2.2.1 Regression Hypothesis

The Regression Hypothesis, one of the earliest linguistic frameworks, was proposed by Roman Jakobson (1941, as cited by De Bot & Weltens, 1991), who studied language loss in aphasia and dementia, and language development in children. The basic assumption of this theory is that language loss mirrors first language acquisition. From Jakobson's study it became clear that the Regression Theory does not hold for language loss in aphasics, as the disorder has a very sudden onset and is not progressive. However, in dementia language loss is gradual and progressive, and seems to fit the Regression Hypothesis as several studies have shown similarities between language in elderly people and children (De Bot & Weltens, 1991). Later, De Bot and

Weltens (1991) adapted this theory to attrition. In their view, the Regression Hypothesis does not as much apply to the order of acquisition and decline, but rather to the pattern in decline. This would mean that more automatised skills would be less susceptible to attrition.

For a long time most available data pointed in the direction that indicates that the regression hypothesis does not account for the observed cases of language decline (Caramazza & Zurif, 1978, as cited in Goral 2004 and De Bot & Weltens, 1991; Hyltenstam & Viberg, 1993). However, Keijzer (2005) states that the theory has not been rigidly applied in non-pathological language attrition and that it *is* a tenable theory to explain L1 attrition. However, it is in need of reinterpretation. According to Keijzer (2005), regression might mean going back to the latest stage of optionality. In order to verify the latter, she studied Dutch immigrants in Canada, a Dutch adult control group and a group of Dutch children of age 14[4], using a variation on Berko-Gleason's (1958) Wug-test. Instead of plurals, subjects were asked to produce diminutives. The preliminary results of this study supported Keijzer's interpretation of the Regression Hypothesis.

2.2.2 Universal Grammar as a Framework for Attrition

In light of the Principles and Parameters framework (Chomsky, 1981), Seliger (1996) claims that attrition is motivated by the reduction of redundancy of underlying language structures, and is guided by principles that are similar to the Subset Principle (SP) and Uniqueness Principle (UP) that guide first language acquisition in the theory of Universal Grammar (UG). According to his Redundancy Reduction Principle (RRP), a bilingual speaker will merge the formerly separate and autonomous language systems into one large system, with interchangeable parts. In the case of L1 attrition this implies that if the L1 and L2 grammars of the bilingual have different ways of expressing the same semantic concept or function, only one of those realtions available in the grammars will 'survive'. (Seliger, 1996:618). So, if both L1 and L2 use different linguistic mechanisms to express the same semantic information, the RRP in syntax predicts that those forms in the L2 that are less marked are more likely to replace more marked forms in the L1. In other words, the less marked forms in the L1 are less prone to attrition. Marked forms here are grammatical forms that are more complex and have a narrower linguistic distribution (Seliger, 1996; Gürel, 2004). In the light of null and overt subjects, this would mean that the more marked null subjects are likely to be replaced by the less marked overt subjects.

Sorace (2000b) and Tsimpli et al. (2004) 'fine-tuned' this theory in their Minimalist approach to attrition. According to them, parameter settings provide grammatical options that may be recruited to achieve a range of semantic and pragmatic effects. This particular '*exploitation of the*

[4] as opposed to the normal comparison between attriters and small children

grammatical options' (Tsimpli et al. 2004: 258) is most likely to be subject to attrition. Explained in light of the Minimalist interpretation of the Principles and Parameters framework (Chomsky, 1995), [± interpretable] features determine the selectivity of attrition (Tsimpli et al. 2004; Gürel, 2004). [- Interpretable] features, such as case and agreement suffix on verbs, drive the syntactic derivation, and will not be influenced by attrition. Conversely, [+ interpretable] features have interpretative effects, which means that "*they can be "read" by the conceptual/intentional systems of cognition*" (Tsimpli et al., 2004: 258). For instance, in her study concerned with the Null Subject Parameter (NSP), Sorace (2000b) explains that a [- interpretable] feature licenses the existence of null subjects in a particular language, such as the phonological realisation of agreement features. However, the [+ interpretable] feature [± Topic Shift] is one of the features that determine the distribution of null subjects. In case of any discourse changes, such as differentiation in context or contrast, a subject NP bares new information, and therefore is informative. In case the context remains the same, a subject NP would bare no informativeness, and is therefore omitted. The results of the studies by Sorace (2000b), Tsimpli et al. (2004) and Gürel (2004) indeed show that the null subject option ([- interpretable] feature) in attriters is still available in the L1, but the distribution (dependent on [+ interpretable] feature) deviates from that in monolingual's grammar. Section 2.4 discusses this topic into greater depth.

So, whereas the RRP is mainly concerned with syntax, in this approach L1 attrition affects the interface between syntax and discourse/pragmatic constraints. The computational system itself remains unaffected.

2.2.3 Linguistic Feature Hypothesis

According to the Linguistic Feature Hypothesis (Andersen, 1982), linguistic factors determine the extent of language loss. Whether a certain linguistic item is of high or low frequency, and whether the item is marked or unmarked, will play an important role in whether the linguistic item is lost or retained. Also, linguistic items in the attriting language similar to the corresponding items in the dominant language are less vulnerable to attrition than dissimilar items. De Bot and Weltens (1991) add that there might be an interaction between the two features, e.g. that low frequency words are lost earlier, only if they are dissimilar to their L2 equivalents. Yagmur and colleagues (1999) performed lexical naming tasks with Turkish L1 speakers in Australia, and their findings on lexical retrieval difficulties are in line with Andersen's predictions that low-frequency and highly marked lexical items are vulnerable to loss.

With regards to syntactic features in particular, Anderson hypothesizes that an attriter will use a smaller amount of syntactic devices than a monolingual speaker of the same language.

Furthermore, the attriter will preserve and overuse syntactic constructions that more transparently reflect the underlying semantic and syntactic relations. In the case that there is more than one possible surface structure for a certain underlying relation, the attriter will tend to merge the different surface structures into one (Anderson, 1982: 99). In situations where this type of transformation results in the loss of information, the attriter can compensate. This can be achieved either by paraphrasing (avoiding a certain structure) or by the use of '*a semantically related but partially inaccurate and inappropriate equivalent when using paraphrasing [...] to compensate for his linguistic gaps in language X*' (Andersen, 1982:106). The transfer of structures from the dominant language into the attriting language is also predicted to be a compensatory strategy (Andersen, 1982). Next to the support for the Linguistic Feature Theory from lexical attrition studies, some results from the studies on null subjects described in the previous section could be taken as support for the syntactic application of this theory. The overuse of overt subject as a consequence of the non-null subject L2 could be regarded as using an 'inappropriate equivalent' of the null subject. However, in her study on German-English bilinguals, Altenberg (1991) found changes in L1 verb usage, which was most prominent in cases where the verbs were phonetically similar between L1 and L2. This points in the exact opposite direction of the Linguistic Feature Hypothesis that predicts that items with interlinguistic similarity will be retained to a higher extent than less similar items.

2.2.4 Activation Threshold Hypothesis

The inhibition phenomenon plays a central role in the Activation Threshold Hypothesis (ATH). Inhibition was originally introduced as the factor that accounts for the distinction between loss and inaccessibility of linguistic elements in several memory disorders. In such cases the linguistic information is still present in mental representations. The activation of the linguistic information is, however, inhibited, disabling the patient to use it. Studies on aphasics showed that the language most frequently used by the patient would be the first to recover (Pitres 1985, as discussed in Gürel, 2004). On the other hand, the language that was used to a lesser extent would be recovered to a more limited extent due to inhibition. The ATH specifies the relation between the frequency with which a linguistic item is used and its availability to the language user. The more often an item is activated, the lower its activation threshold is. If an item is inactive, this will cause a raise in threshold for that particular item. The higher the activation threshold is, the more difficult it will be to (re)activate the item, as more activating impulses are needed to reactivate it (Gürel, 2004). Within this framework, attrition manifests itself as reduced accessibility, caused by a high threshold due to reduced activation (Köpke & Schmid, 2004).

Paradis (2004; as presented in Paradis, 2005) embeds the ATH in a neurolinguistic theory of bilingualism (2004), which makes the following assumptions and predictions about L1 attrition: Linguistic items that are sustained by declarative memory (e.g., the lexicon) are more vulnerable to attrition than those sustained by procedural memory (e.g., phonology, morphosyntax). Within the framework of the ATH, language disuse should gradually lead to language loss. Eventually, low frequency linguistic items in the L1 will be replaced by more frequently occurring equivalents of the L2. Furthermore, the production of an item requires a lower threshold than the comprehension of that same item because, '*among other things, the underlying neural substrate must generate the excitatory impulse from within, as opposed to being excited by stimulation from the incoming auditory or visual signal that impinges on the peripheral sensory organs*. *This means that comprehension can be achieved with a threshold that would be too high for production.*' (Paradis, 2005). In terms of attrition this means that production will show to be affected earlier than the interpretation of a specific linguistic item.

Attitude and motivation can influence the threshold, thus also influence the attrition process. Basically, both internal (emotional) and external (situational) factors can raise or lower an activation threshold by modulating the production or inhibition of various neurotransmitters. '*Organtion and processing continue to act in the same way, but upon modified components*' (Paradis, 2005).

2.2.5 Dynamic Systems Theory

Dynamic Systems Theory (DST) makes an attempt to integrate several theories on attrition (De Bot, 2005). Language development, in the sense of both growth and decline, is seen as a complex, permanently fluctuating system. Due to interaction with (and among) other (sub)systems and internal self-reorganisation, systems never completely settle as long as there is sufficient input. All variables within the system affect all other variables in the system, and thus affect itself (Jessner, 2003). Studying first language attrition in particular can shed light on the self-reorganizing behaviour of complex systems. In this approach growth and decline are regarded as natural tendencies of systems that depend on the availability of both internal and external resources. Hence, in the DST both sociolinguistic and psycholinguistic factors are taken into account when studying multilingual subjects. Attrition is seen as a gradual process of information decay, dependent on time. As a consequence, recall of information becomes more difficult and unlikely as the phase between learning and recall becomes longer (Jessner, 2003). However, languages can be re-acquired as much as they can be 'forgotten', if the circumstances are right (Jessner, 2003). Language dominance plays a large role: as one's L2 becomes more

dominant than their L1, there is less recall in the L1, thus the intervals become larger, and the L1 information will start to decay (Jessner, 2003).

Within the DST framework, it is suggested that the two gradual processes of language attrition and replacement take place simultaneously in the brain. The maintenance of two or more languages at a similar level is considerably more demanding as the maintenance of a monolingual system: the multilingual brain constantly has to match or differentiate two or more systems in order to keep them at a steady state. Hence, psycholinguistic systems that contain more than one language are less stable than monolingual systems. A lack of language effort will result in the speaker returning to a monolingual norm, with the accompanying linguistic reorganisation (Jessner, 2003). As the interaction between language acquisition and language attrition has a crucial role in the stability of a language system, the two need to be considered together. Some studies with computer models have confirmed the DST (Meara, 2004). However, the theory is not sufficiently supported by empirical data from research on bilingual subjects.

2.2.6 Summary & Parallels

Attrition can manifest itself in various domains of the linguistic system, and can occur on the level of competence and performance, where a deviation in the performance of the L2 speaker usually precedes a change in competence. The Regression Hypothesis, the Linguistic Feature Hypothesis and the RRP predict that attrition depends on the characteristics of a certain linguistic item. The Regression Hypothesis has been explained in several ways. Originally, it implies that the items that were learned last will become subject to attrition first. In De Bot and Weltens' (1991) interpretation, the most automatic skills are least susceptible to attrition, despite the developmental order in which they were acquired. According to Keizer (2005), regression means going back to the latest stage of optionality.

According to the Linguistic Feature Hypothesis, the frequency of certain linguistic items in the attriting language, and the similarity of equivalent items among the L1 and L2 will determine their susceptibility to attrition. Low frequency items and items that are dissimilar to their equivalents in the L2 are most susceptible to attrition, with a possible interaction amongst those to features. In the RRP, markedness determines what linguistic elements become subject to attrition or not. Forms in the L2 that are less marked are more likely to replace more marked forms in the L1. The less marked forms in the L1 are less prone to attrition. These theories all have in common that attrition is a purely linguistic phenomenon, and leave personal, input, and pragmatic factors aside. Also, these theories can be applied both to changed linguistic performance and competence.

By taking pragmatics into account, Sorace (2000b) and Tsimpli et al. (2004) hypothesize that it is not so much the syntactic rules themselves that are subject to attrition, but the pragmatics that govern syntactic structures. Thus, attrition takes place at the interface between syntax and discourse/pragmatics. In congruence with the RRP, markedness plays a role in the manner in which linguistic items are influenced.

From a neurololinguistic perspective, the ATH predicts that input from the environment will decrease or increase the activation thresholds for certain linguistic features. The more prevalent a linguistic item is, the lower the threshold to activate it. This is also what the de Bot and Weltens' (1991) interpretation of the Regression Hypothesis, and the Linguistic Feature Hypothesis predict. The ATH in addition assigns a role to personal attitudes towards a language, which is thought to influence the threshold, and therefore ease in activation. In this view, a bilingual has some control over their attrition/maintenance process in the L1.

The Dynamic System Hypothesis seems similar to the ATH, in the sense that a wide variety of internal and external factors can influence the accessibility of certain linguistic items. However, the accessibility of a particular linguistic item can correlate with the accessibility of another linguistic item or items with which it is connected in linguistic representation.

2.3 Attrition in Early Bilinguals vs. Late Bilinguals

From bilinguals that migrated as adults we would expect that their L1 acquisition would have been complete, and their proficiency level in L1 is therefore native-like. However, children that move to a different language environment cannot be said to have completed their first language acquisition fully, and therefore should be more likely to suffer from L1 attrition. Köpke (2002) has indeed found that studies on L1 attrition show that children's L1 does show clear signs of attrition, whereas research with adults has yielded mixed results regarding the extent to which the L1 is attriting. Jamshidiha & Marefat (2006) have also shown that the age of L2 acquisition has a major influence on how bilinguals represent their L1. The problem with putting these findings in context of attrition is that it is hard to say to which extent one is able to talk about language attrition in children. As Seliger (1991) explains, the unlearning process in a context of early bilingualism is initiated by a lack of access to L1 data, and the growing dominance of L2. The 'unlearning,' or attrition, is triggered by indirect positive evidence from L2 projected onto L1. Furthermore, Sorace (2004) argues that studying the language of a person who started using an L2 as a child does not provide us with information about L1 attrition, but rather it investigates attrition of an L1 that has never been fully acquired. Since the language was never completely acquired, the term attrition might not be in place to start with.

An important consideration in the study of attrition is the assessment of the subjects' linguistics knowledge as it was before attriting. This is easier to control for with late bilinguals, as they had a completely acquired L1 before starting to use their L2 to a large extent, which allows for the use of a certain standard for the native language of all subjects in a study on attrition. Such a standard is hard to set for (adult) early bilinguals, which has a consequence on the interpretability of the results. For this reason, the present study focuses on adult bilinguals.

2.4 Null Subjects and Postverbal Subjects in Attrition

Following Sorace (2000b) and Tsimpli et al. (2004), this study focuses on attrition effects in the pronominal system and on word order. This section will first introduce the differences between S/C/B and Dutch with respect to null subjects (2.4.1) and postverbal subjects (2.4.2), and will continue with an overview of previous studies that have focused on these grammatical features in the context of bilinguals first language acquisition (2.4.3), second language acquisition (2.4.4) and attrition (2.4.5).

2.4.1 Differences in Pronominal Subjects between S/C/B and Dutch

In contrast to Dutch, S/C/B has the option to drop pronoun subjects in declarative sentences, as illustrated in (2a).

(2a) *Radim* *(S/C/B)*
Work-PR-1SG
'I am working'

(2b) * *Werk* *(Dutch)*
Work-PR-1SG

Agreement features in S/B/C show great morphological richness that interacts with tense distinctions (Kordić, 1997; Wechsler & Zlatić, 2000), as shown in (3a) For the purpose of this study, I assume that rich inflectional morphology license omission of subject pronouns.

(3a)	pričam	*I talk*	1SG
	pričas	*you talk*	2SG
	priča	*he/she talks*	3SG

pričamo	*we talk*	1PL
pričate	*you (pl.) talk*	2PL
pričaju	*they talk*	3PL

Dutch has a less rich inflection system, as illustrated in (3b). Hence, it does not allow the drop of subject pronouns in declarative sentences.

(3b)	(ik) werk	*I work*	1SG
	(jij) werkt	*you work*	2SG
	(hij)/(zij) werkt	*he/she works*	3SG
	(wij) werken	*we work*	1PL
	(jullie) werken	*you (pl.) work*	2PL
	(zij) werken	*they work*	3PL

Several discourse factors determine whether a subject pronoun is used or dropped in S/C/B, such as topic shift and emphasis. So, once a referent is introduced as the topic using a full noun phrase or as a subject pronoun, the subject pronoun that refers to the topic can be dropped. As a consequence, the use of an overt pronoun generally implies topic shift.

(4a) *Svaki student misli da će.*
Every-NOM-M-SG student-NOM-M-SG think-PR-3SG that will-AUX
on *dobiti desetku*
he-NOM get-P ten-ACC-F
'Every student thinks that he will get an A'

In (4a), overt pronoun **on** can only be interpreted deictically (Franks, 2005). Conversely, Dutch only employs overt pronouns. The Dutch equivalent of (4a) is shown in (4b).

(4b) *Elke student denkt dat hij een tien heeft gehaald.*
Every student-SG think-PR-3SG that he a ten have-PR-3SG earn-P
'Every student thinks he got an A'.

The sentence in (4b) is ambiguous as it can have two interpretations: the pronoun **hij** can either refer to '*elke student'* in which case every student thinks that he *himself* has got an A (but the others did not), or **hij** can be interpreted deictically, referring to one particular student that all

other students think of. The interpretation of sentences as in (5b) heavily depends on the context in which it is used in.

Whereas in general the use of an overt pronoun implies topic shift, this does not always have to be the case. On some occasions the subject pronoun is mentioned for the second time, and then dropped (Browne, 1993; Kordić, 1997). However, such inclusion of an unemphatic pronominal subject in S/C/B is stylistically marked (Franks, 1995, 2005). A subject appears when it is rhematic or contrasted (Browne, 1993; Kordić, 1997;):

(5a) *Bicikl sam popravila ja*
Bicycle-ACC-M-SG be-AUX-1-SG repair-AP-F-SG I-NOM
'It was me who fixed the bicycle.'

In Dutch, the same goal is achieved by placing prosodic emphasis on the overt pronoun, as illustrated in (5b):

(5b) *IK heb de fiets gemaakt*
I have-SG1 the bicycle fix-P
'***I*** fixed the bike (he did not)'

The subject pronoun's appearance can also indicate emphasis on the whole sentence (Browne, 1993; Kordić, 1997):

(6a) *Taj auto želiš imati? Znaš*
That-ACC-M-SG car-ACC-M-SG want-PR-2SG have-INF know-PR-2SG
li ti koliko taj auto košta?!
IRG you-NOM how much that-ACC-M-SG car-ACC-M-SG cost-PR-3SG

The insertion of the subject pronoun **ti** does not change the meaning of the question, but places extra emphasis on it. This way the question is not just 'do you know how much that car costs?', but entails an 'are you out of your mind?'-factor. In Dutch, one would emphasise by changing the prosodic pattern in the sentence, and/or by inserting the word 'wel', as illustrated in 6b:

(6b) *Weet jij wel hoeveel die auto kost*?
Know-PR-SG2 you surely how much that car-SG cost-PR-SG3
'Do *you* know how much that car costs?

The interesting difference between S/C/B and Dutch is not so much between null subjects in S/C/B and overt subjects in Dutch, but between overt pronouns in both languages. Whereas the use of an overt pronoun in S/C/B introduces a new referent, indicates a contrast, or places emphasis on the whole sentence, the use of overt pronouns in Dutch does not.

2.4.2 Differences in Availability of Postverbal Subjects between S/C/B and Dutch

Another difference between S/C/B and Dutch is the availability of postverbal subjects in the prior, whereas the latter does not allow postverbal subjects in declarative sentences. SVO is grammatical in both S/C/B and Dutch, as illustrated by (7a) and (7b) respectively.

(7a) *Pas je ujeo čoveka*
dog-NOM-SG is-AUX-1SG bite-AP man-ACC-SG
'The dog bit the man'

(7b) *De hond beet de man.*
The dog bit the man

In S/C/B, SVO is the neutral word order, but other constituent orders are possible as well, as inflectional endings indicate the grammatical relations and roles in the sentence (Dik & Gvozdanović, 1981; Browne, 193; Kordić, 1997; Kitić, 2002). In Dutch the word order is more restricted, as the strict word order in sentences such as (7b) is SVO. Changing the constituent order in (7a) and (7b) results in the following sentences for S/C/B and Dutch respectively:

(8a) *Čoveka je ujeo pas*
man-ACC-SG is-AUX-1SG bite-AP dog-NOM-SG
'The dog bit the *man*'

(8b) *De man beet de hond*
The man bit the dog.

As can be seen in (8a) and (8b), the change of constituent order in Dutch changes the syntactic roles of subject and object, because Dutch only allow SVO structure in such sentences. As Dutch

is a V2 language, the subject can occur postverbally in more complex sentences[5]. However, subject-verb (SV) order is restricted by syntactic rules.

Contrastively, in S/C/B the syntactic roles in (8a) remain the same due to rich inflection, which means that multiple syntactic structures can be used to express the same phenomenon, although any other structure than SVO is marked. Topic-comment structure generally determines which structure is used. The following will illustrate this a bit more in depth in the context of a simple sentence – a simple independent clause consisting of only a subject and a verb.

Full sentences of the SV type are relatively rare in Serbian (Kitić, 2002).

(9a) *Ptica leti*
Bird-NOM-SG fly-PR-3SG
'The bird is flying.'

(9b) *De vogel vliegt*
The bird-SG fly-PR-3SG
'The bird is flying.'

(10a) *Vetar duva*
wind-NOM-SG blow-PR-1SG
'The wind is blowing.'

(10b) *De wind waait.*
The wind-SG blow-PR-3SG
'The wind is blowing.'

Within the simple sentence form, some differences between sentence elements of the two languages occur when we deal with the marked word order. Dutch syntax does not allow any alternations without an accompanying change in meaning. Meanwhile, S/C/B allows the above sentences to be transformed into VS forms with the same meaning as the equivalent SV form. However, such deviation of topic-comment order yields a special effect, and thus is contextually marked. Similar to the use of an overt subject in situations where there is no topic shift, VS form places extra emphasis on a preposed comment (Browne, 1993). One can say:

[5] Since the verb has to come in second place, adverbials that are placed sentence-initial will automatically move the subject to a postverbal position. Moreover, in subordinate clauses, the constituent order is SOV (Schetter, 1994), without any possible variation.

(11a) Leti ptica
'The bird is flying'

(11b) Duva vetar
'The wind is blowing'

This type of sentences is considered to be more informative in the sense that it communicates 'something new' (e.g. a change in situation, or contrast). The information is marked by pre-position. (Kitić, 2002: 305). One would utter (12a) in two scenarios: *a)* if the bird in question had a broken wing and was unable to fly before; *b)* if it is the bird and not the bat (or something else) is flying. Existential sentences in SV form are unmarked, and are mainly found in written language. In spoken language, the marked VS form is always used to communicate something new (Kitić, 2002: 306). In Dutch, constituent reversal in a simple SV sentence has a different effect:

(12a) *Vliegt de vogel?*
'Does the bird fly?'

(12b) *Waait de wind?*
Does the wind blow?'

Placing a verb sentence initially in Dutch forms a question, as illustrated by the inversions in (13a) and (13b). Although the original sense of the sentence is lost, inversion still results in a grammatical form in this type of sentences. The same cannot be said of the examples below.

(13a) *Studenti su stigli*
Student-NOM-PL be-AUX-3PL arrive-AP-PL
'The students have arrived'

(13b) *De studenten zijn aangekomen*
The student-PL be-PR-3PL arrive-P
'The students have arrived.'

(13c) *Stigli su studenti*
arrive-AP-PL be-3PL student-NOM-PL

'The students have arrived'

(13d) **Aangekomen zijn de studenten*
arrive-P be-PL the student-PL

In S/C/B, both (13a) and (13c) are grammatical, and have the same meaning. (13c) is the more marked and informative form, and would be used in the same type of context as described above with (11a) (Dik & Gvozdanović, 1981; Kitić, 2002). A thing that has to be mentioned though is that the clitic auxiliary 'su' changes position in reference to the subject and verb. Clitics always come in second position of a sentence; after the first word or after the first constituent of that sentence (Stjepanović, 1998). This also holds for sentences with null-subjects, as in (2a).

Now if we look at the Dutch equivalents, we see that SV is the grammatical form, but that VS is not accepted, unless perhaps in a medieval/poetical context (as in: 'Arrived have the students, and all celebrate their victory'). However, in modern everyday language use, this word order generally does not occur.

An additional feature of S/C/B that is worth mentioning in the context of this study, is that S/C/B does not employ articles. Hence, there are no linguistic elements that grammaticalise definiteness (Trenkić, 2004). This is not only in contrast with the Dutch language, but also with Italian and Greek, which are the languages in which attrition of null subject- and postverbal subject use has been studied before. This matter is elaborated on in sections 2.4.5, 2.4.6, and 2.5.

2.4.4 Pronominal Subjects and Postverbal Subjects in Bilingual First Language Acquisition

The children's omission of subjects seems to be guided by pragmatic factors. They omit subjects if they are not informative, and do use them if they are. However, children are not always aware of what the person they talk to knows, and might consider a context as such that they can drop the subject pronoun, where an adult would have used one. Several studies on monolingual and bilingual L1 acquisition (Serratrice, 2004; Serratrice et al., 2004) have in fact shown that the interface conditions governing the use of referential pronouns in null-subject languages are acquired late. Several studies have been done with children acquiring two languages from birth, in which one language was a null subject language, and the other one was not (Paradis & Navarro, 2003 for Spanish-English bilinguals; Serratrice et al, 2004 and Serratrice, 2004 with Italian-English bilingual children). These studies consistently showed that there is an effect of the

non-null subject languages on the null subject languages, which manifests itself in the overuse of overt pronouns in the null subject language. The non-null subject language does not show any overuse of null subjects though, and there is no delay in the rate at which they start using subjects. Furthermore, data from adults that had a Spanish-English bilingual first language acquisition, but who developed dominance in English also show an overuse in overt pronouns (Sattersfield, 2003). However, the study does not state whether the participants are first generation or second generation immigrants from Latin American countries in the US. Because of this, the type of input in Spanish is unknown, and one can't determine whether the effect measured is an individual, developmental phenomenon or an intergenerational effect.

Finally, research in Italian children has shown that the processing of relative clauses with postverbal subjects is more problematic in younger children (age 5-7) than in older children (9-11), or adults (Arosio et al, 2005).

2.4.5 Pronominal Subjects and Postverbal Subjects in Second Language Acquisition

In the studies by Filiaci (2003) and Sorace and Filiaci (2006), English L2 speakers of Italian used more redundant overt pronouns than native speakers of Italian, in both spontaneous speech and elicited production tasks. Also, they were more likely to interpret anaphoric overt pronouns as referring to the subject of the main clause than native speakers. However, there were no differences between the two groups in the use and interpretation of null subjects.

Moreover, Filiaci (2003) compared the production of preverbal and postverbal subjects between English speakers of L2 Italian. The subject NP's could either be definite or indefinite. This was important, as in Italian the choice of postverbal over preverbal subjects in Italian one-place predicates is amongst others regulated by definiteness[6]. In the indefinite subject condition, the English L2 speakers of Italian produced significantly more preverbal subjects than the native speakers did.

2.4.6 Pronominal Subjects and Postverbal Subjects in First Language Attrition

Attrition in the pronominal system in a setting of a null subject L1 and a non-null subject L2 has been the subject of several studies. The phenomenon has been studied with subjects with a variety of null subject languages as their L1, such as Greek and Italian (Tsimpli et al. 2004; Sorace, 2000b) and Turkish (Gürel, 2004), and English as the L2. The obtained data showed a

[6] The thematic properties of the verb also play a role in choosing a preverbal or postverbal subject.

uniform deviation from the control group by the experimental group, which pointed in the same direction as of the research in bilingual L1 acquisition and L2 acquisition. Attriters showed deviant behavior when it came to using and interpreting overt subject pronouns, but treated null subjects the same as the participants in the control group. However, these congruent results were interpreted in different ways. Tsimpli et al. (2004) and Sorace (2000b) propose that the syntax-discourse conditions on the distribution of pronoun subjects are developmentally vulnerable to optionality in the context of prolonged exposure to an L2. Attrition in the L1 is said to be due to the emerging influence of the L2 on [+interpretable] features that exist within the L1 representations. The consequent is under specification at the syntax-discourse interface, which results in ambiguity in use and interpretation of overt subject pronominals. However, the syntactic features that license null subjects remain unaffected.

Gürel (2004) on the other hand, views null subjects in the framework of Government Binding (Chomsky, 1981), rather than from a Minimalist point of view. The process of attrition is viewed in light of the ATH. The overuse of overt pronouns is explained by stating that the corresponding linguistic element in the L2 (overt subject pronouns in English) interferes with the disused L1 element (null subjects in Turkish). The threshold for the linguistic item in the L1 is raised, and therefore the item becomes inhibited. '*The binding properties of the English overt pronoun are activated in lieu of the binding properties of the L1 Turkish pronoun*' (Gürel, 2004: 74). However, Gürel does mention that the obtained results are in line with the results obtained by Sorace (2000b), which are also interpreted in terms of government binding and ATH.

Furthermore, Tsimpli et al (2004) and Sorace (2000b) discuss postverbal subjects in context of attrition. Basically, the same pattern is found here. As postverbal subjects do not occur in English, no significant difference is found in use and interpretation of postverbal subjects between Greek and Italian L2 speakers of English and the monolingual control groups. In Greek, preverbal subjects seemed to have undergone the same process as overt pronominal subjects. Both the L1 and the L2 license SV order, which result in an over production of preverbal subjects in sentences with definite subjects and a difference in their interpretation when compared to monolinguals.

2.5 Motivation for this Study, Research Questions

While previous research on attrition in the pronominal system has provided important findings, it is not clear to what degree these findings can be extended to other language pairs. In this respect, the present study offers a new insight into the phenomenon.

The language pair of S/C/B and Dutch has not been explored in the light of attrition studies as stated above before. S/C/B differs from Italian and Greek in an important way: it does not employ articles. This study might be informative in showing to what extent definiteness plays a role in the use and interpretation of preverbal and postverbal subjects as shown in Tsimpli et al. (2004), and Sorace (2000b). In addition, Dutch as the L2 differs from English in several important ways: *i)* it is a V2 language; *ii)* it has different word order in main and subordinate clauses (SVO vs. SOV); *iii)* subject reversal in a simple SV sentence forms a question rather than an ungrammatical construction.

Furthermore, this study includes a second experimental group next to the group of immigrants that have been living in the Netherlands for a substantial amount of time (for over 12 years). The participants in this second group have arrived in the Netherlands in the past five years, and have all been or still are studying the Dutch language in order to pursue their professional ambitions in a Dutch-speaking language environment. At the time of the data collection, a large part of these participants was already working in a Dutch language setting. A comparison between these two groups and a monolingual control group might provide important clues about the distinction between attrition on the performance vs. competence levels. And in general, it would be interesting to see to what extent these two groups differ from each other and from the control group.

The above lead to the following research questions that served as a guide for this research:

Firstly, will the use of a language pair, consisting of two languages that are typologically different from previously used languages, confirm previous results?

i) Will the interpretation of overt subjects by L2 speakers of Dutch deviate from that of monolingual speakers of S/C/B?

ii) As Dutch allows preverbal and postverbal subjects in different grammatical structures, will there be any difference at all in the way the L2 speakers of Dutch use and interpret preverbal subjects?

Secondly, what role does time of exposure to the L2 play?

i) Will the immigrants who arrived to the Netherlands relatively recently show a pattern that lies somewhere in between the linguistic behaviour of the immigrants that have been in the Netherlands for a long time and the monolingual controls, or do they resemble one of the latter two more than another?

3. The Study

3.1.Summary & Predictions for Attrition Effects in the Domain of Syntactic Subjects

Previous research has shown that L2 acquisition and L1 attrition interact to a considerable extent. When an L2 becomes dominant over an L1 in an individual's daily language use, some linguistic elements might become subject to attrition, both at the level of performance and the level of competence. Attrition in performance generally precedes attrition in competence. Previous studies on attrition in pronominal systems and preverbal/postverbal subjects in Italian and Greek speakers of L2 English have shown that the syntactic options of null subject and postverbal subject remain intact, but that overt subjects and preverbal subjects are vulnerable to attrition. As overt subjects and preverbal subjects, which are available in pro-drop and non-pro-drop languages, are subject to different discourse factors in each language, and are thus more problematic for attriters. More specifically, attriters overgeneralise the overt pronominal subject and the preverbal subject when compared to monolingual speakers of the L1.

The aim of this study is to investigate syntactic attrition in the domain of grammatical subjects in Serbian, Croatian, and Bosnian advanced speakers of Dutch. The previous chapter shows that morphologically rich languages such as S/C/B allow subject pronoun drop and postverbal subjects in declarative sentences. The choice between null and overt pronouns and preverbal and postverbal subjects depends on the discourse factors topic shift and focus. Contrastively, Dutch does not allow null subjects, and word order is determined by syntactic rather than pragmatic constraints.

Based on these findings, the following hypotheses have been formulated: *i)* the interpretation of overt pronoun subjects by the Dutch L2 speakers will deviate from functionally monolingual speakers of S/C/B. More specifically, the Dutch L2 speakers will not necessarily interpret an overt subject pronoun as an indicator of focus and topic shift, and hence will consider sentences with overt pronouns to be ambiguous more often than monolingual speakers of S/C/B. Null subjects are not expected to be interpreted differently between groups; *ii)* because the subject-verb order in Dutch is syntactically constrained rather than pragmatically guided as in S/C/B, the Dutch L2 speakers are predicted to behave differently from monolingual speakers of S/C/B in their interpretation and production of preverbal and postverbal pronouns. In particular, preverbal subjects are expected to be interpreted as topic shift or focus less often, and to be overgeneralised in production (i.e. the bilinguals are predicted to used significantly more preverbal subjects than the monolinguals); *iii)* the immigrants who have arrived in the Netherlands relatively recently are predicted to behave differently from both the immigrants that have lived in the Netherlands for a

longer period of time and monolingual speakers of S/C/B. The immigrants that have arrived recently are expected to show a different behaviour from the monolinguals in performance (i.e. production) predominantly. The immigrants who have been in the Netherlands for a longer period of time are expected to also differ in their interpretation of overt pronominal subjects and preverbal subjects. In general, the immigrants who have been in the Netherlands for a longer time are expected to deviate from the monolinguals in performance more so than the immigrants that arrived recently.

In order to test the above hypotheses, several elicited response tasks that are described in section 3.3 have been administered to measure differences in interpretation and use of S/C/B grammatical subjects in beginner/intermediate and advanced speakers of Dutch.

3.2 Participants

Three groups of participants were involved in this study: The first two experimental groups consisted of native speakers of Serbian/Croatian/Bosnian who are currently living in the Netherlands. The first group of Long Term Residents of the Netherlands (LTRN) contained 14 subjects who have been living in the Netherlands for over 12 years, and the second group of Short Term Residents of the Netherlands (STRN) contained 9 subjects that have been living in the Netherlands for 5 years or shorter[7]. The third group was a control group of native speakers of Serbian/Croatian/Bosnian who permanently reside in their native country. The participants were recruited through personal contact and further reference from the participants themselves. The proficiency in Dutch of subjects in the first two groups was assessed by means of a Cloze-test (see Appendix B). Table 3.1 presents the details of the three groups of participants, including number of participants per group, mean age, minimum and maximum age, mean age of arrival in the Netherlands, mean years of residence in the Netherlands, and proficiency in Dutch based on the Cloze test.

Table 3.1: Descriptive Statistics of Participants

	N	Mean Age	Min. Age	Max. Age	Mean AoA	Mean NL	Prof
LTRN	14	52.9	31	68	27	25.9	81.1
STRN	9	31.4	29	36	27.6	3.8	58.9
Control	11	46.7	21	59			

[7] Due to technical problems, several subjects had to be excluded from the study.

3.3 Design

The participants were involved in two experiments: (1) the Picture Verification Task (PVT), and (2) the Headlines Task (Tsimpli et al. 2004; Filiaci, 2003). For the purpose of this research all stimuli were translated into S/C/B. There were three different versions for each task in the L1: one in Serbian, one in Croatian, and one in Bosnian (For an overview of the differences between these three languages, see Luč ić (1999)).

3.3.1 Picture Verification Task

This task was designed to test the interpretation of null and overt subjects in the context of forward and backward anaphora and the interpretation of preverbal and postverbal noun phrase (NP) subject. The stimuli used in this task consisted of a sentence presented along with three pictures, from which the participants were asked to choose the picture that matched the content of the sentence most accurately.

The first 20 of these stimuli sentences consisted of a main clause and a subordinate clause. The main clause always consisted of an animate NP, a transitive verb, and an animate object NP. The subordinate clause contained either an overt or a null subject. The subject and object of the main clause always had the same gender and number, creating the ambiguous situation in which the subordinate clause could always refer to either subject or object. The subordinate clause either preceded (forward anaphora) or followed (backward anaphora) the main clause. The two types of anaphora were equally distributed, and for each type half the sentences contained a null subject, and the other half an overt pronominal subject. The three pictures represented three possible scenarios to which the sentence could refer. See Figure 3.1 for an example.

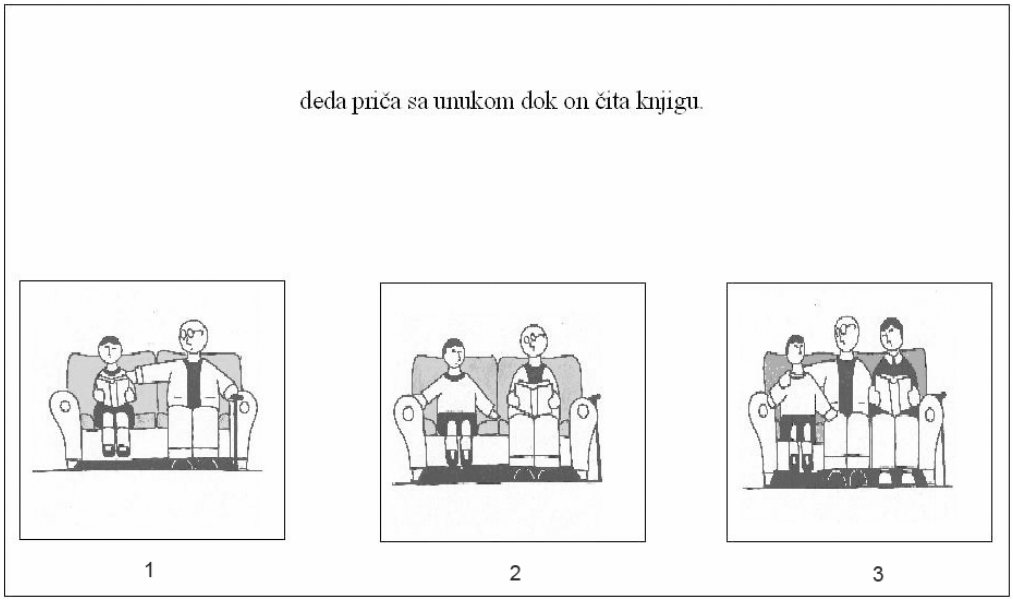

Figure 3.1: Example PVT with anaphora: '*The grandfather is talking to the grandson, while he is reading a book.*'

In one of three pictures, character 'X' performed both the action described in the main clause and that described in the relative clause. In another picture, character 'X' performed the action described in the main clause only, whereas a third character 'Z', who was not mentioned in the main clause, performed the action described in the subordinate clause. In the third picture character 'X' performed the action described in the main clause, while a character 'Y' (the direct object in the main clause) performed the action in the subordinate clause.

The 10 stimuli designed to test the interpretation of preverbal and postverbal subjects consisted of two independent clauses, where the first clause provided the context for the second clause. See Figure 3.2 for an example.

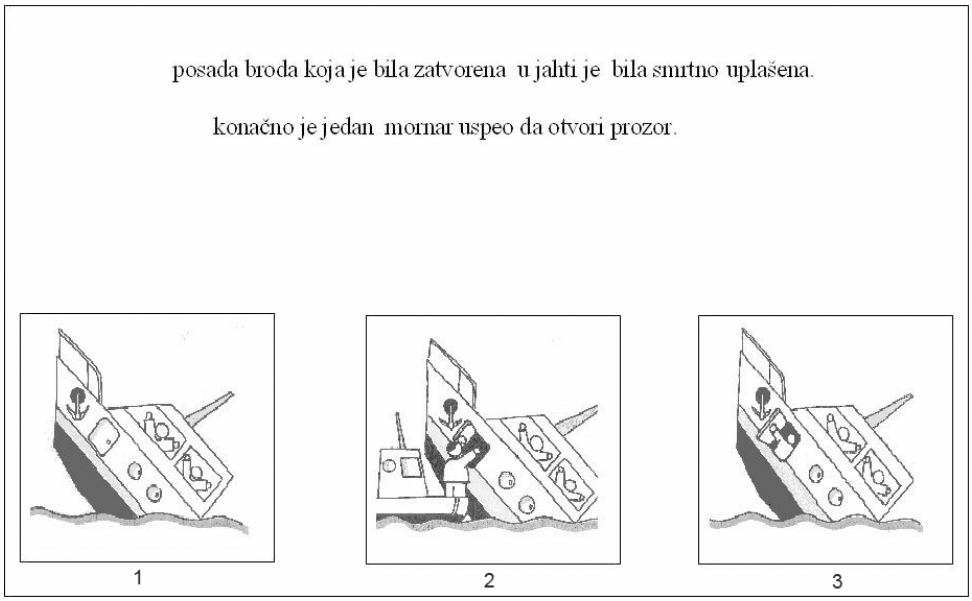

Figure 3.2: Example PVT with preverbal and postverbal subjects: '*The crew that was stuck in the yacht was terrified. Finaly a sailor managed to open the hatch*.'

An adjunct, a subject NP and a verb formed the second clause. The subject NP was always a hyponym of the topic NP in the first clause. The subject of the second clause was presented either preverbally or postverbally. In one picture the object/character performing the action described in the second clause belonged to the group of objects or characters in the first clause. In the second picture, the action described in the second clause was external to the group of objects/characters, and in the last picture nobody/nothing performed the action described in the second clause. Half of these stimuli were presented with a preverbal subject NP and half with a postverbal subject NP.

Furthermore, there were ten filler items. The meaning of the filler sentences was never ambiguous in that only one of the three pictures matched the content correctly. The anaphora

items, the preverbal and postverbal items and the fillers were presented in a random order. In addition, the order in which the three pictures appeared along with the sentence was randomized for all three items.

3.3.2 Headlines Task

This task was designed to elicit the production of sentences with overt preverbal and overt postverbal subjects. On a computer screen, the participants were shown a picture presented together with phrases distributed around the picture (see Figure 3.3). The participant was asked to form a newspaper headline from these phrases. These phrases always included a verb, a subject noun phrase and an adjunct (see Appendix C for a complete list of experimental items). 14 verbs were used, with each verb appearing in two contexts, i.e. each verb was used with a specific subject NP and a non-specific subject NP. For example, the verb 'poplaviti' (to be flooded) was used in combination with 'nekoliko sela' (some villages) as an non specific subject NP, and with 'katedrala Svetog Marka' (the San Marco cathedral) as a specific subject NP. For each trial, 20 out of 28 experimental items were randomly chosen to reduce the length of the experiment (see Filiaci, 2003 for details).

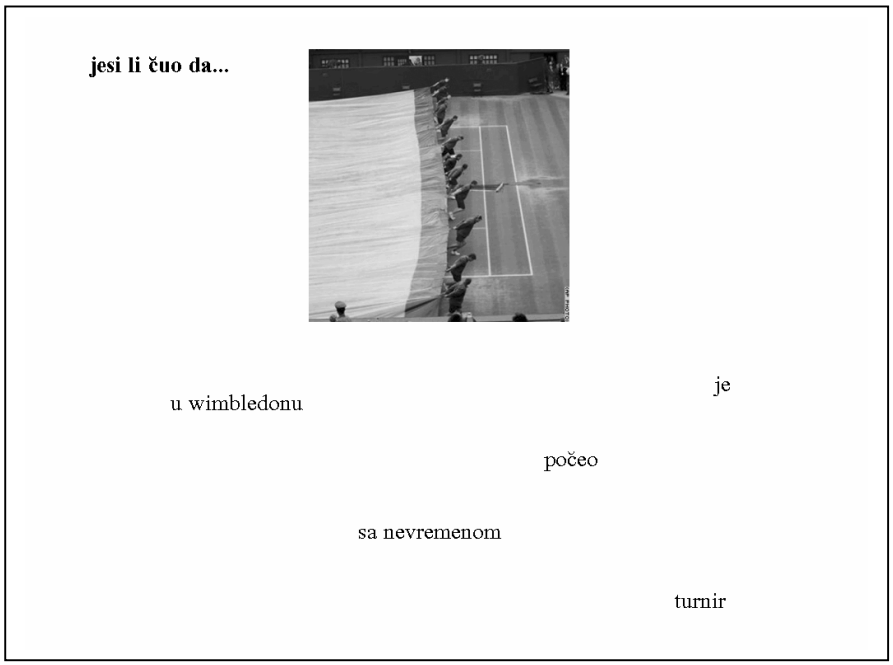

Figure 3.3: Headlines Task: "*Have you heard that the tournament in Wimbledon started with a thunderstorm*.'

3.4 Procedure

3.4.1 Instructions

After being given a short explanation about the experiment, all subjects were asked to fill in a questionnaire about their linguistic background based on Gürel (2004) (see Appendices D and E). Subsequently, the participants (in the LTRN and STRN groups only) were instructed to fill in the Cloze-test (Appendix B) that was designed to assess their proficiency in Dutch. They were asked to write down only one word per gap. Once these two tasks were completed, the participants proceeded with the two elicitation tasks.

In the PVT, the participants were instructed to indicate which of the three pictures that appeared with each sentence represented the exact meaning of the sentence. The numbers 1, 2 and 3 were projected underneath the three pictures, and the participants made their choice by typing in one of these numbers. Participants were told to choose more than one picture, in case they found that a sentence had multiple interpretations, corresponding to more than only one of the three pictures presented (see Appendix F for the exact instructions).

In the Headline Task, participants were asked to produce a sentence that described a picture on the computer screen. They were asked to use only the phrases that were presented along with the picture, in the exact form given. They were asked to begin their sentence with 'Jesi li ćuo da…' ('Have you heard that….', see Appendix G for the exact instructions). The experimental items in both tasks were always preceded by two practice items, during which additional instructions were given if necessary.

3.4.2 Stimuli Presentation & Data Collection

Both the PVT and the Headline Task, respectively, were performed in E-Prime v. 1.1 sp3 and run on a Dell laptop with a 14.1" screen, (resolution: 1024 x 768). For the PVT, the participants responded by typing in their response using numbers on the keyboard. In the Headline Task, the participants produced an oral response, which was recorded with an M-Audio Microtrack 24/96 solid-state recorder.

3.4.3 Coding & Scoring

The answers given in the PVT were collected and sorted according to the stimulus category (e.g. forward/backward anaphora, overt/null subject, preverbal/postverbal subject). For each category the total amount of responses was added up, in order to determine the proportion and to calculate the percentage that each type of answer represented in the total. For instance, if a

participant would have given 6 responses in total in the category backward anaphora with null subject, and 3 of these answers would have been the picture in which the subject of the main clause also performed the action described in the relative clause, 50% of all answers would consist of the answer 'subject'. If a participant indicated all three pictures to correspond to the meaning of the sentence, that particular item was excluded from the analysis, on the assumption that either the content of the pictures or the sentence was not clear (Filiaci, 2003). All other responses (e.g. when only one or two pictures were indicated to correspond to the interpretation of the given sentence) were taken into account. For each participant the proportion of the preferred interpretation for each experimental condition was calculated (e.g. forward anaphora with overt subject, overt anaphora with null subject, backward anaphora with overt subject, and backward anaphora with null subject). The percentages of all three groups were compared per stimulus category by means of an ANOVA.

In the Headline Task, all sentences were transcribed and categorized according to the specificity of the subject NP. For each of the two experimental conditions (Non-specific Subject and Specific Subject), the percentage of SV order and VS order was calculated. The percentages of SV order of each group were used to conduct an ANOVA.

4. Results

4.1 Picture Verification Task – Anaphora Sentences

4.1.1 Backward Anaphora

In the backward anaphora with overt subjects condition, the results show no statistically significant difference among the groups for any of the possible answers: 'Other' [*F (2, 31) = .345; p = .711*], 'Complement' [*F (2, 31) = .412; p = .666*], and 'Subject' [*F (2, 31) =.104; p = .902*].

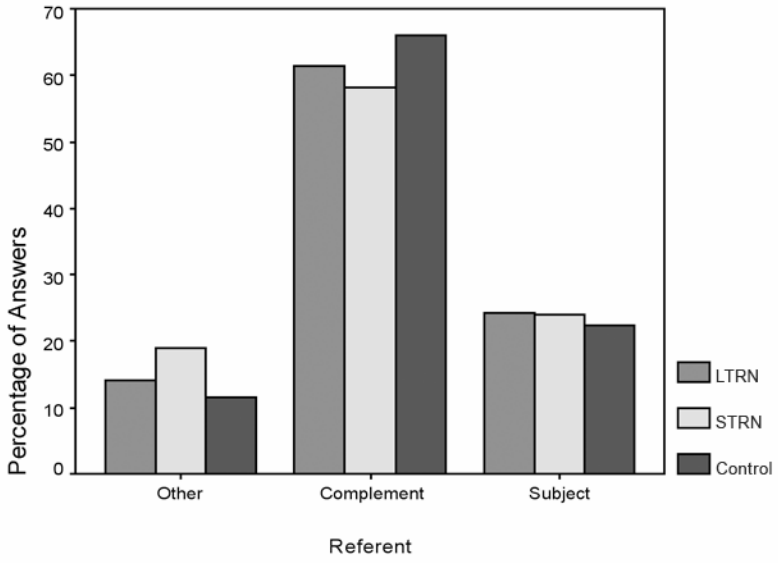

Figure 4.1: PVT backward anaphora with overt pronominal subjects. Percentage of preferences for the possible referents of the overt subject in the subordinate clause.

In the backward anaphora condition with null subjects, the three experimental groups differ significantly for the answer 'Complement' [*F (2, 31) = 4.061; p = .027*], whereas the results showed no significant difference for the answers 'Other', [*F (2, 31) = .043; p = .958*] and 'Subject' [F (2, 31) = 2,719; p = .082].

The averages for the three groups are: 26% of answers 'Complement' for the LTRN, 22% for the STRN group and 45% for the control group. The Post Hoc test (Tukey HSD) reveals a significant difference between the control group and the STRN (*p = .042*). However, there appears to be no significant difference between the LTRN and the control group (*p = .059*), and the LTRN and the STRN groups (*p = .906*).

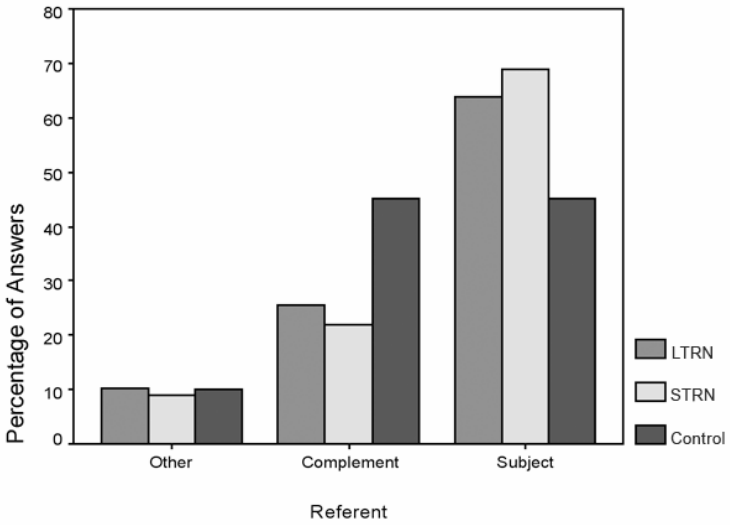

Figure 4.2: PVT backward anaphora with null subject. Percentage of preferences for the possible referents of the null subjects in the subordinate clause.

In the backward anaphora sentences, the participants in both the LTRN and STRN do not differ in their interpretation of overt pronominal subjects when compared to the control group, and to each other. When looking at the participants' interpretation of null subjects in backward anaphora, the STRN group differs significantly from the control group, in that they choose the complement of the main clause as the subject of the relative clause less often.

4.1.2 Forward Anaphora

In the forward anaphora condition with overt pronominal subjects, there are no statistically significant differences among the three groups for any of the possible answers: 'Other' [*F (2, 31) = 1.772; p = .187*], 'Complement' [*F (2, 31) = 1.480; p = .243*], and 'Subject' [*F (2, 31) = .772; p = . 471*].

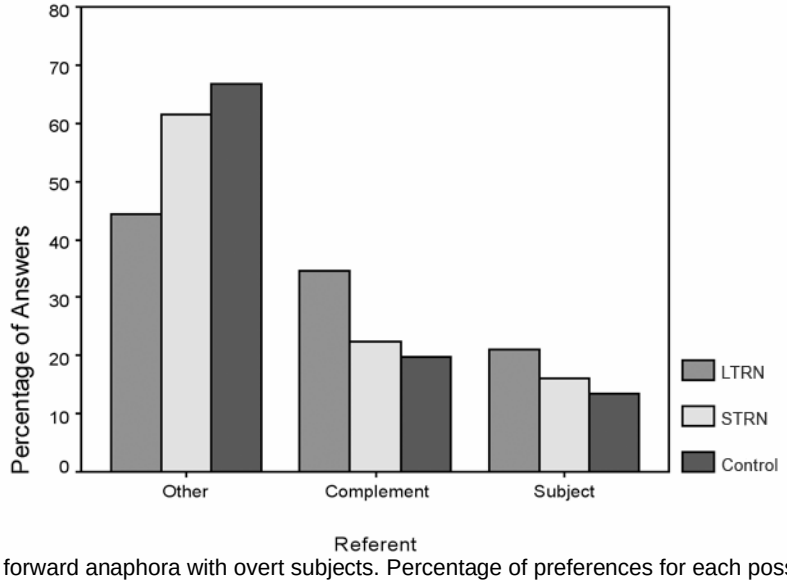

Figure 4.3: PVT forward anaphora with overt subjects. Percentage of preferences for each possible referent of the overt subject in the subordinate clause.

Also, in the forward anaphora condition with null subjects, there are no statistically significant differences among the three groups for any of the possible answers: 'Other' [*F (2, 31) = 1.754; p = .190*], 'Complement' [*F (2, 31) = 1.051; p = .365*], and 'Subject' [*F (2, 31) = 2.337; p = .113*]

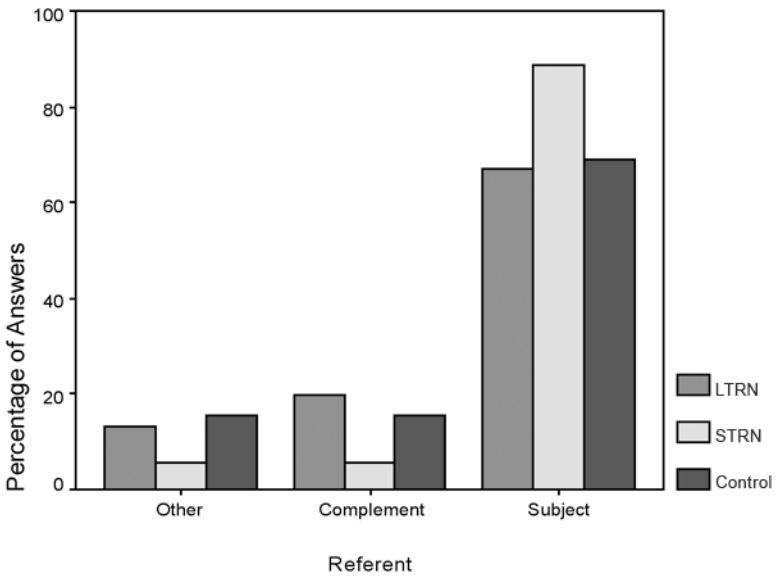

Figure 4.4: PVT forward anaphora with null subjects. Percentage of preferences for each possible referent of the null subject in the subordinate clause.

In the forward anaphora sentences, the participants in all three groups do not differ significantly from each other in their interpretation of both overt pronominal subjects and null subjects.

4.2 Picture Verification Task – Pre/Postverbal Subject Sentences

4.2.1 Preverbal Subject Condition

In the preverbal subject condition, the three experimental groups differ significantly in their preference for answering 'Both' [*F (2, 31) = 4.483; p = .019*], i.e., giving both 'Old' and 'New' as an answer for the same experimental item. For 'New' [*F (2, 131) = 1.729; p = .194*], 'Old' [*F (2, 31) = .101; p = ,904*], and 'Wrong' [*F (2, 31) = 1.067; p = .356*], the groups did not differ significantly.

The averages of double answers are: 25% for the LTRN, 50% for the STRN, and 21% for the control group. The Post Hoc test (Tukey HSD) reveals a significant difference between the STRN

and LTRN groups ($p = .044$), and the STRN and the control group ($p = .024$). However, there is no significant difference between the LTRN and the control group ($p = .901$).

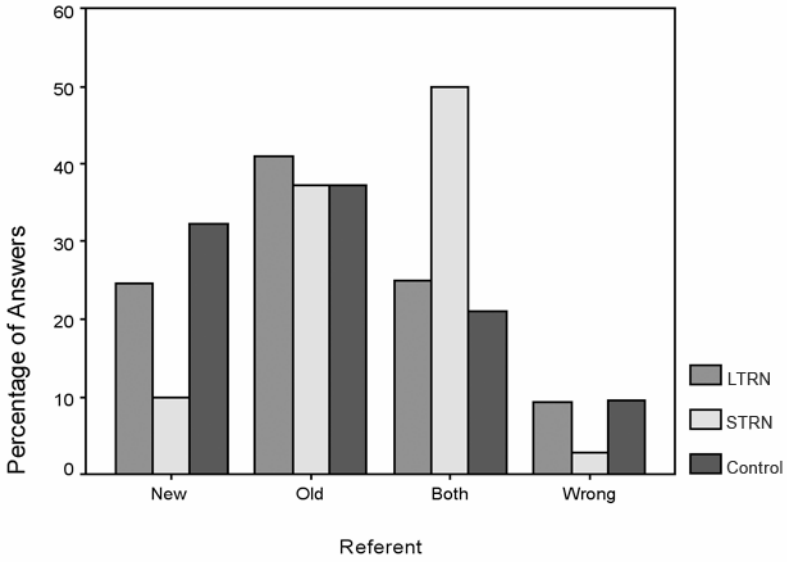

Figure 4.5: PVT preverbal subject condition. Percentage of preferences expressed for the possible referent of the preverbal subject.

When interpreting preverbal subjects, the participants in the STRN group often consider it to be possible that the subject represents both a member of the earlier introduced group, and as a new, external individual. STRN give this interpretation twice as often as LTRN and even more than twice as often as the control group. However, the two latter do not show any significant difference in their behaviour.

4.2.2 Postverbal Subject Condition

In the postverbal subject condition, the three experimental groups differ significantly in their preference for the answers 'New' [$F (2, 31) = 3.941; p = .030$] (LTRN 50%, STRN 22% and Control 45%) and 'Both' [$F (2, 31) = 4.734; p = .016$] (LTRN 18%, STRN 52%, and Control 27%). For 'Old' [$F (2, 31) = 3.012; p = .064$] and 'Wrong' [$F (2, 31) = 2.049; p = .146$], the results show no significant difference amongst the three groups.

For the answer 'New', the Post Hoc test (Tukey HSD) shows a significant difference between LTRN and STRN only ($p = .028$). The differences between LTRN and the control group ($p = .886$) and STRN and the control group ($p = .095$) are not significant. Also in the case of 'Both', the Post Hoc test (Tukey HSD) reveals only a significant difference between LTRN and STRN (p = .013). The differences between the LTRN and the control group and the STRN and control group are not significant (p = .686; p = .097 respectively).

When interpreting postverbal subjects, the LTRN consider the subject to refer to an individual new to the context more often than STRN. The latter consider the subject to possibly represent both a member of the earlier introduced group, and to a new, external individual more often than LTRN.

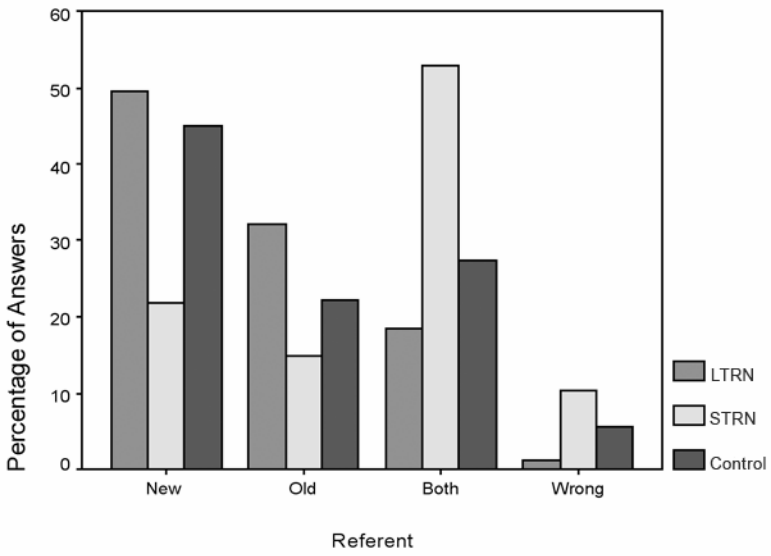

Figure 4.6: PVT postverbal subject condition. Percentage of preferences expressed for the possible referent of the postverbal subject.

4.3 Headlines Task

The results show a higher production of preverbal subjects for the LTRN and STRN group, when compared to the control group. This finding is true for both the non-specific subject condition and the specific subject condition (36% preverbal non-specific subjects and 51% preverbal specific subjects for LTRN, 38% preverbal non-specific subjects and 56% preverbal specific subjects for STRN, and 14% preverbal non-specific subjects and 34% preverbal specific subjects for the control group). The ANOVA shows a significant difference between the three experimental groups for both preverbal non-specific subjects [$F\ (2, 31) = 8.368;\ p = .001$] and preverbal specific subjects [$F\ (2, 31) = 4.386;\ p = .021$].

For the preverbal non-specific subject sentences, the Post Hoc test (Tukey HSD) reveals a significant difference between LTRN and the Control group ($p = .003$), and STRN and the control group ($p = .004$). The difference between LTRN and STRN is not significant ($p = .975$). For the preverbal specific subject sentences, the Post Hoc test (Tukey HSD) reveals a significant difference between STRN and the control group ($p = .027$). However, there is no significant difference between the LTRN and the control group ($p = .063$) and LTRN and STRN ($p = .518$).

Overall, the S/C/B produce more preverbal subjects. The participants in LTRN and STRN produce more than twice as much preverbal subjects in sentences with a non-specific subject. In sentences with a specific subject, the participants in the STRN group produce more preverbal subjects than the control group, but do not differ in their production from the participants in LTRN.

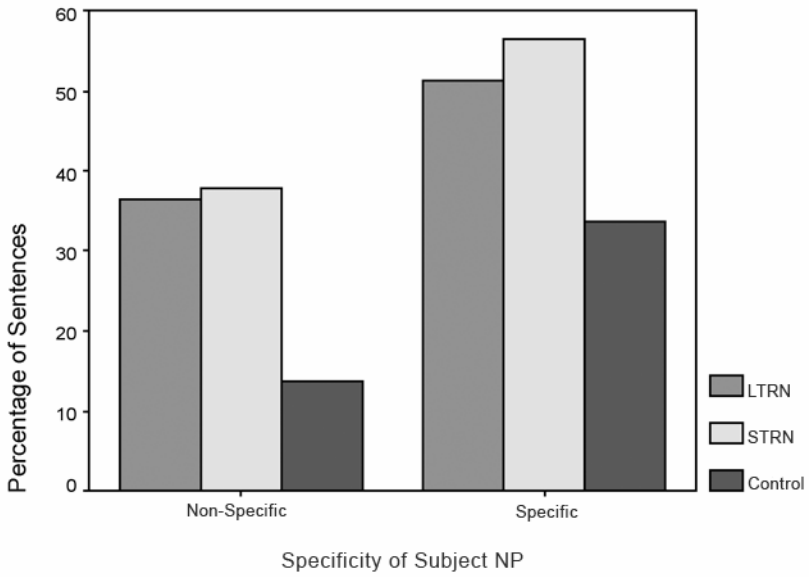

Figure 4.7: Headlines Task. Percentage production of preverbal subjects in the Non-Specific Subject and in the Specific Subject condition.

5. Discussion

The aim of this study was to investigate whether the use and interpretation of overt subjects and preverbal subjects in S/C/B are affected by the knowledge of L2 Dutch. The study found that monolingual speakers of S/C/B and S/C/B speakers of L2 Dutch do not significantly differ in their interpretation of pronominal subjects. In all three groups the overt subjects of the embedded clause were overall interpreted as the complement of the matrix clause in backward anaphora, and as a 'new' referent in forward anaphora. This finding, i.e. no difference in the interpretation of overt pronouns in the group of advanced S/C/B/ speakers of L2 Dutch, contrasts with the findings for Italian and Greek speakers of L2 English in Tsimpli et al. (2004). In this respect, the present study does not seem to confirm the hypothesis that [+ interpretable] features -- which are assumed to underlie the distribution and interpretation of overt pronominal subjects -- become unspecified as an effect of attrition.

Moreover, in contrast to the predictions of this study, a difference was found in the bilingual speakers' interpretation of sentences with null rather than overt subjects. This was particularly the case in the context of null subjects in backward anaphora. While the control group interpreted the null subject of the embedded clause as potentially ambiguous, with both the complement (45% of total answers) and subject (45%) of the embedded clause as the antecedents, the two groups of S/C/B speakers of Dutch showed a stronger preference for the subject of the matrix clause (64% for LTRN, 69% for STRN). However, it was only the STRN group that differed significantly from the control group. This is a rather surprising finding in a number of ways. First, the bilingual speakers had problems with *null* subjects rather than *overt* subjects, in contrast to our predictions. Second, both groups of bilinguals fail to interpret the structure as ambiguous, with potential reference to a complement and a third, newly introduced, referent. It is possible that bilingual speakers tend to avoid ambiguous readings as a result of a more general universal tendency to encode highly accessible referents represented by null pronouns as subjects (e.g. DuBois, 1987; 2003; Givon, 1997). Again we see a contrast in findings between the present study and the studies by Tsimpli et al. (2004).

With reference to the theories of attrition that were reviewed in Chapter 2, the findings of this study seem to best fit the Linguistic Feature Hypothesis rather than the Minimalist approach to explaining attrition, as it is the item that is most different between the L1 and L2 that appears to be affected. In other words, it seems that bilingual learners in this study differed the most in the interpretation of the linguistic form that was absent in their L2. However, there might be other

factors underlying the difference between the results of the present study and the study performed by Tsimpli et al. (2004), such as typological differences between the different pro-drop languages. Future research should attend to such differences in more detail in order to determine what might underlie these different results. It is also possible that the test sentences used in this study were not particularly suitable for speakers of S/C/B. That said, the fact remains that native controls did differ from the bilingual speakers in their interpretations.

In the interpretation of sentences with preverbal subjects, the results from the STRN group partially confirmed the predictions. The results showed that the control group and LTRN group mostly interpreted sentences with preverbal subjects as either representing a 'new' or 'old' referent (32% and 25% vs. 37% and 41% respectively), the STRN group often indicated both the 'old' and 'new' to be the possible referent for the same subject (50%, vs. 21% in the control group and 25% in the TRN). It was in the amount of these two-way interpretations given that the only significant difference amongst groups was found. This indicates that the sentences with preverbal subject were interpreted as significantly more ambiguous for the STRN group than for the other two groups. This finding is in accordance with the findings of Tsimpli et al. (2004), and could be explained by their hypothesis that the [+ interpretable] features that are held to be responsible for the distribution and interpretation of sentences with preverbal subjects become unspecified as an effect of attrition. In contrast to the findings with null and overt sentences in anaphoric sentences, this finding does not fit the LFH, as it concerns a difference in interpetation of a linguistic form that is present in both the L1 and the L2 of the participants. In this respect, this particular finding fits the Activation Threshold Hypothesis better, as it predicts that linguistic elements that have a corresponding form in the L2 will be vulnerable to attrition, because of a 'competition' between the L1 and L2 elements.

In the postverbal subject condition, the STRN group differed significantly from the other two groups in the percentage of answers that they gave in the category 'new' and 'both'. The LTRN and control group mostly interpreted the subject to refer to a new referent (LTRN 50% and Control 45% vs. STRN 22%), whereas the STRN interpreted the postverbal subjects ambiguously by indicating two possible referents for the same subject NP. (52% vs. 18% for LTRN and 27% for Control). Although this was not predicted, the STRN show an increase in indeterminacy in the interpretation of postverbal subjects. Tsimpli et al. (2004) explain this as a possible '*side-effect of attrition found in the interpretation of preverbal subjects*' (p.269). This might be a plausible explanation in the context of all the results that their study yielded, but in context of the present study it might be the case that the availability of postverbal subjects under certain syntactic constraints in Dutch is an underlying source of vulnerability to attrition effects.

This means that, whereas the results with null and overt subjects indicate that the LFT might be the appropriate framework for the findings of the present study, the results found with preverbal and postverbal subjects do not. There is a difference in interpretation of the linguistic item that occurs in both languages, and a difference in interpretation of a linguistic item that is constrained on different levels (pragmatic vs. syntactic for S/C/B and Dutch respectively) across both languages. Perhaps, as with preverbal subjects, the ATH might provide a proper framework for this finding. For now, however, it remains uncertain what it is that causes the differences in interpretation between monolingual speakers of S/C/B and S/C/B speakers of Dutch at an intermediate level. As with the null and overt subjects, it is important that future studies focus on the typological differences that may exist between Greek and S/C/B, and English and Dutch; it is possible that these could account for the differences between the results of Tsimpli et al (2004) and the present study.

In the Headlines Task, both groups of Dutch L2 speakers produced significantly more preverbal subjects than the monolingual S/C/B speakers. Instead of definite and indefinite subjects (Tsimpli et al., 2004; Filiaci, 2003), specific and non-specific subjects were used since definiteness is not formally encoded in S/C/B. Generally, more preverbal subjects were produced in the specific subject condition than in the non-specific subject condition. In sentences with non-specific subjects, both the LTRN and the STRN significantly produced more preverbal subjects than the control group (LTRN 36% and STRN 38% vs, Control 14%). However, in sentences with specific subjects, only the STRN produced significantly more preverbal subjects than the control group (56% vs. 34%). Hence, the specificity of the subject of a sentence does not only seem to influence the production rate of sentences with preverbal subjects, but also the rate of deviation that both groups show in comparison to the control group. However, to explain this influence, more theoretical background is needed on the role of specificity in the distribution (and interpretation) of preverbal subjects.

Leaving this matter aside, it can be said that the results of this task support the hypothesis that the bilinguals overgeneralise preverbal subjects. It thus seems that the acquisition of L2 Dutch does influence subject-verb order in S/C/B. This confirms the predictions and is in accordance with the findings of Tsimpli et al. (2004). Therefore, the results of this task support the hypothesis that the [+ interpretable] features that are claimed to determine the distribution of preverbal and postverbal subjects become unspecified as an effect of attrition.

However, taken the results of all the three tasks together do not uniformly support this hypothesis, which implies that the Minimalist approach to language attrition in the full context of

syntactic subjects as described in Tsimpli et al. (2004) and Sorace (2000b) does not hold for L1 S/C/B under influence of L2 Dutch.

The most striking finding in this study is that, in contrast to the predictions, the STRN deviate from the control group more often and to a higher extent than the LTRN. This is probably due to the fact that the participants in the STRN group have an intermediate level of proficiency in Dutch, and are still acquiring the L2, whereas the participants in the LTRN group are considered to have stabilised at their advanced proficiency level. Second language acquisition in these learners, hence language use in general in an intermediate stage of L2 acquisition, requires high demands on their cognitive abilities, which can be hypothesised to underlie "the interference" in the L1 in the STRN group. As the LTRN group's L2 is stable, there is no such interference by the second language acquisition process. In short, the results of all tasks indicate a developmental instability in the L1 that is related to the acquisition of the L2, which stabilises once the proficiency in the L2 has reached a (relatively) steady state. Perhaps this finding is related to the findings in L1 acquisition, where children initially start of using the right form for past tense in irregular verbs, then go through a phase of overregularisation, and end up using the proper forms at a later stage of acquisition (e.g. the 'bell curve') (Pinker, 1995). In addition, this finding is interesting when viewed in the light of interlanguage. Apparently, interlanguage does not only concern the state of the L2 in different stages of acquisition, but also the state of the L1. Moreover, the concept of 'native speaker' might need to be reconsidered if the 'native state' of one's L1 fluctuates according to L2 proficiency. However, the present study only includes two groups of L2 speakers. It might be useful for future studies to include subjects that are at different stages of L2 acquisition to understand the nature of the interaction between L1 and L2 in more detail (e.g. both beginner and intermediate next to advanced and/or near-native).

Furthermore, the LTRN group showed to deviate from the control group in the production task only, whereas there was no significant difference in the two interpretation tasks. This finding fits in the framework of the ATH; Activation thresholds are generally much higher for production, as self-activation In other words, a difference in the use of certain linguistic items does not have to predict a difference in interpretation of the same linguistic items. It remains a question to what extent these findings can be generalized to *competence* and *performance*, as competence entails more than merely the manner in which certain linguistic items are interpreted in a certain language. In order to make more specific statements on this particular topic, and on attrition in general, future research should include a wider variation of tasks. Ideally, a grammaticality judgement task and an analysis of spontaneous speech would be included. The

grammaticality judgement task would test for the acceptability of sentences with preverbal and postverbal subject NP's for different groups of speakers. The spontaneous speech analysis would provide a better insight in the use of null and overt subjects and preverbal and postverbal subjects in conversation (i.e. in less controlled situations). Unfortunately, the timeframe in which this research was conducted was limited, which is why the two elicited production tasks were selected from the wider range of possibilities.

One important factor that needs to be taken into account when studying the results of this study and studies on attrition in general, is that language changes in both monolingual and in bilingual settings. Living in an L2 setting will have a different impact on an L1 system than living in an L1 setting. One cannot be entirely sure that the L1 the attriter "once had'' is the same system as the one that monolingual speakers of the same L1 have today. Perhaps attrition studies of the kind as the present one do not indicate a difference in linguistic systems due to L2 knowledge and use, but a difference in linguistic *change* due to L2 knowledge and use. This might be something to control for in future research.

6. Conclusion

This study has examined first language attrition in the context of syntactic subjects in L1 S/C/B under the influence of L2 Dutch. The results suggest that the linguistic system of native speakers of S/C/B, after living in a Dutch L2 language setting for a long period of time, has altered. Moreover, the S/C/B immigrants that have been in the Netherlands for 5 years or shorter show an effect of L2 acquisition in both the interpretation and production of syntactic subjects, whereas the immigrants who have been in the Netherlands for at least 12 years only show effects of L2 acquisition in the production of syntactic subjects. Hence, attrition does not seem to be the gradual process of 'decline' as it was suggested to be in previous studies, but more likely a fluctuating process.

Furthermore, the results of this study have disconfirmed prior hypotheses on attrition in pro-drop languages. These hypotheses stated that attrition has as an effect that overt subjects and preverbal subjects are interpreted differently, whereas null-subjects and postverbal subjects are not. In this study, immigrants that have arrived recently do not interpret overt subjects differently from monolinguals, whereas null-subjects and preverbal and postverbal subjects are interpreted differently. In addition to disconfirming the prior hypotheses on attrition in pro-drop languages, the overall results do not fit any of the proposed theoretical frameworks that were reviewed. Rather, the results from each separate task pointed in a different direction, which suggests that both much more careful research and perhaps revision of the existing theories is needed, before a universal approach to language attrition can be taken.

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Appendix A: Complete list of Abbreviations

ACC	accusative
ATH	Activation Threshold Hypothesis
AP	active participle
AUX	auxiliary verb
DST	Dynamic Systems Theory
F	feminine
LFH	Linguistic Feature Hypothesis
LOC	locative
LTRN	long-term residents of the Netherlands
L1	first language
L2	second language
M	masculine
NOM	nominative
NP	noun phrase
P	perfective
PL	plural
PR	present
PVT	Picture Verification Task
RRP	Redundancy Reduction Principle
S/C/B	Serbian/Croatian/Bosnian
SG	singular
SOV	subject-object-verb order
SP	Subset Principle
STRN	short-term residents of the Netherlands
SV	subject-verb order
SVO	subject-verb-object order
UG	Universal Grammar
UP	Uniqueness Principle
VS	verb-subject order
V2	verb-second word order
1	1st person
2	2nd person
3	3rd person

Appendix B: Cloze-Test

Vul de missende woorden in:

Slank, gezond en toch een te hoog cholesterol

HOOFDDORP - Mensen kunnen slank zijn, gezond leven _____ toch een te hoog cholesterolgehalte hebben, _____ het erfelijk bepaald is. Naar schatting 135.000 _____ in Nederland hebben een erfelijk hoog _____. Driekwart van hen weet dat niet _____ loopt het risico op een onverwachts _____ op jonge leeftijd. Dat gebeurt soms al _____ mensen van dertig.

Als mensen het _____, is het volgens directeur Hans van Laarhoven van _____ stichting Bloedlink mogelijk om jaarlijks duizenden _____ te redden. Wie familieleden heeft die _____ jonge leeftijd een hartinfarct hebben gehad, _____ er goed aan dit met zijn _____ haar arts te bespreken om te _____ of het erfelijk is, raadt Van Laarhoven _____ aan. Want de aandoening is goed _____ behandelen.

Zijn patiëntenvereniging lanceerde daarom de Rode Veter campagne, _____ ook een haring wordt aangeboden. Met _____verkoop van rode veters hoopt de _____ geld in te zamelen om meer _____ te geven en onderzoek te laten _____. De haring is bedoeld om weer _____ de aandacht te brengen dat vette _____ gezonde vetzuren bevat die beschermen _____ hart- en vaatziekten.

Officiële hittegolf voorlopig van de baan

AMSTERDAM - De tropische temperatuur van 30 _____ is maandag op een aantal plaatsen _____. Toch wordt het geen officiële hittegolf, _____ in De Bilt de temperatuur _____ 29,8 graden onder deze waarde is _____, meldt het KNMI maandag.

In Nederland _____ officieel sprake van een hittegolf als _____ maximumtemperatuur in De Bilt gedurende minstens vijf _____ elke dag 25 graden of hoger _____ en in dat tijdvak bovendien op _____ drie dagen minstens 30 graden is _____.

Alleen zondag is het in De Bilt _____ tropische dag geweest waarbij de temperatuur _____ de 30 graden uitkwam. Woensdag is _____ warme weer weer verdreven.

Toename

Een officiële _____ komt statistisch in ons land ongeveer _____ in de drie jaar voor, maar _____ zit er veel meer of juist _____ tijd tussen, meldt het meteorologisch instituut.

_____ laatste keer dat er een hittegolf _____ Nederland was, was van 18 tot 24 juni vorig _____. Dat was de enige hittegolf in _____ jaar. In Gilze Rijen werd het toen 34,7 _____.

Volgens de nieuwste klimaatscenario's van het KNMI _____ de kans op hittegolven in de _____ toe.

Appendix C: Complete list of Experimental Items (Bosnian version)

PVT - Backward Anaphora

- with overt subjects

1. *Stara žena maše djevojci dok ona prelazi ulicu.*
   'The old woman waves at the girl while she crosses the street.
2. *Sekretarica pomaže medicinskoj sestri dok ona piše pismo.*
   'The secretary helps the nurse while she is writing a letter'
3. *Djed priča sa unukom dok on čita knjigu.*
   'The grandfather is talking to the grandson while he is reading a book.'
4. *Nana pokazuje unuci sliku dok ona jede.*
   'The grandmother shows the granddaughter a picture while she is eating.'
5. *Plava djevojka daje dokumente sekretarici čim uđe u kancelariju.*
   'The blond girl gives the documents to the secretary as soon as she enters the office.'

– with null subjects

1. *Majka ljubi kćerku dok oblači kaput.*
   'The mother kisses the daughter while (she) puts on her coat'
2. *Otac maše sinu dok vozi bicikl.*
   'The father waves at the son while (he) is riding a bike.'
3. *Policajac vidi kradljivca dok trči.*
   'The policeman sees the thief while (he) is running.'
4. *Učiteljica pokazuje na djevojku dok priča.*
   'The teacher is pointing at the girl while (she) is talking.'
5. *Trener priča atletičaru dok pije.*
   'The trainer talks to the athlete, while (he) is drinking.'

PVT – Forward Anaphora

- with overt subject

1. *Čim on zatvori kofer, radnik daje novac blagajniku.*
   'As soon as he closes the suitcase, the employee gives the money to the treasurer.'
2. *Dok on otvara vrata, portir pozdravlja poštara.*
   'While he opens the door, the doorman says hello to the postman.'
3. *Dok ona gleda na sat, stara žena se približuje čistačici.*
   'While she looks at the watch, the old lady approaches the cleaning lady.'
4. *Čim on zamakne za ugao, policajac vidi lopova.*
   'As soon as he turns around the corner, the policeman sees the thief.'
5. *Dok on sipa vino, mušterija plaća račun kelneru.*
   'While he's pouring the wine, the customer pays the bill to the waiter.'

- with null subject

1. *Dok zeva, kontrolor uzima kartu od putnika.*
   'While (he) yawns, the ticket collector takes the ticket from the passenger.'
2. *Dok izlazi iz lifta, medicinska sestra gura čistačicu.*
   'While (she) leaves the elevator, the nurse pushes the cleaning lady.'
3. *Dok hoda kroz parka, čuvar parka vidi bezkućnika.*
   'While (he) walks in the park, the park gard sees the tramp.
4. *Dok čeka autobus, sveštenik govori nešto turisti.*
   'While (he) waits for the bus, the priest says something to the tourist.'
5. *Dok otvara vrata, otac čestita sinu rođendan.*
   'When (he) opens the door, the father whishes happy birthday to the son.'

PVT- Preverbal/Postverbal subjects

- Preverbal subject

1. *Grčka vlada je poslala tri ratna broda u Zaljev. Jedan nosač aviona je potonuo.*
   'The Greek government has sent three war ships in the Gulf. An aircraft carrier has sunk.'
2. *U školskom dvorištu su učenici čitali resultati. Jedna djevojka je plakala.*
   'In the schoolyard the students were reading the results. One girl was crying.'
3. *Posada broda koja je bila zatvorena u jahti je bila smrtno uplasena. Konačno je jedan mornar uspio da otvori prozor.*
   'The crew stuck in the yacht was terrified. Finally a sailor managed to open the hatch.'
4. *Direktor škole je odlučio da suspendira nekoliko učenika. Dvoje djece je protestovalo.*
   'The principal of the school has decided to suspend some students. Two kids have protested.'
5. *Učitelj je čekao deset učenika. Nekoliko djevojaka je stiglo u pet.*
   'The teacher was waiting for 10 students. Some girls arrived at five.'

- Postverbal Subject

1. *Djevojka je naručila neke knjige. Poštom su stigla tri romana.*
   'The girl has ordered some books. With the mail arrived three novels.'
2. *Upravitelj fabrike je odlučio dati nekolicini ljudi otkaz. Protestovalo je nekoliko radnika.*
   'The administrator of the factory decided to fire some people. Have protested some workers.'
3. *Komšija sa gornjeg sprata ima blizance. Sinoć je plakala jedna beba.*
   'The to floor neighbour has twins. Last night was crying a baby.'
4. *Rano ujutro tri su broda napustila luku. Na vijestima smo čuli da je potonuo ribarski brod.*
   'Early in the morning three boats left the harbour. We heard on the news that has sunk a fisherman's boat.'
5. *Učitelj je pričao studentima. U jednom momentu je otvorila jedna djevojka vrata.*
   'The teacher was talking to the students. At one point opened a girl the door.'

Filler items

1. Dvoje od troje djece na klupi nosi džemper na linije.
   'Two of the three children on the bench wear striped tops.'
2. Profesor koji je dao studentkinji knjige nosi naočale.
   'The teacher who gave thebooks to the student wears glasses.
3. Ima samo malo hljeba na stolu i nema mlijeka.
   'There's only a little bread on the table and no milk.'
4. Kada je otac otvorio vrata, nije bilo nikoga u sobi.
   When the father opened the door, there was nobody in the room.
5. Čim je djevojka napisala pisma, mrak je pao.
   As soon as the girl had written the letter, it became dark.
6. Dvije od tri mačke na stolu su bijele.
   'Two of the three cats on the table are white.'
7. Cijela porodica je gledala televiziju kada je kiša počela padati.
   All the family was watching TV when it started raining.
8. Kad je žena stigla do autobuske stanice, autobus je već bio krenuo.
   When the woman arrived at the bus stop, the bus had already left.
9. Na stolu ima nekoliko jabuka i nekoliko u korpi.
   There are some apples on the talbe and a few in the basket.
10. Kada je učiteljica stigla u razred, svi su prestali pričati.
    When the teacher entered the classroom, everybody stopped talking.

Headlines Task – "Have you heard that…?"

1. *Jesi li čuo da se u centru Rima srušila jedna zgrada?*
   'Have heard that a building collapsed in the centre of Rome?'
2. *Jesi li čuo da se srušilo klizalište u Berlinu zbog snijega?*
   'Have you heard that the ice rink in Berlin collapes because of heavy snowfal?'
3. *Jesi li čuo da je potonuo tanker u Jadranskom moru?*
   'Have you heard that an oil tanker sank in the Adriatic Sea?'
4. *Jesi li čuo da je trajekt između Ankone i Splita potonuo zbog pukotine u trupu?*
   'Have you heard that the ferry between Ancona and Split has sunk because of a leak?'
5. *Jesi li čuo da je voz iskočio iz šina blizu Amsterdama?*
   'Have you heard that a train derailed close to Amsterdam?'

6. *Jesi li čuo da je međunarodni voz između Rima i Pariza iskočio iz šina zbog velike brzine?*

   'Have you heard that the international train between Rome and Paris derailed because of high speed?

7. *Jesi li čuo da su ponovo počeli sukobi na Bliskom istoku?*

   'Have you heard that hostilities at in the Middle East started again?

8. *Jesi li čuo da je turnir u Wimbldonu počeo sa nevremenom?*

   'Have you heard that the tournament in Wimbledon started with thunderstorm?'

9. *Jesi li čuo da je dvoje ljudi umrlo od ptičije gripe?*

   'Have you heard that two people died of bird flue?'

10. *Jesi li čuo da je predsjednik opštine umro od infarkta?*

    'Have you heard that the mayor died from a heart attack?'

11. *Jesi li čuo da je mnogo sela u južnoj Evropi poplavljeno?*

    'Have you heard that many villages in southern Europe (were) flooded?'

12. *Jesi li čuo da je katedrala Svetog Marka poplavljena zbog oluje?*

    'Have you heard that the San Marco Cathedral (was) flooded because of a storm?

13. *Jesi li čuo da su otkrivene dvije nove planete?*

    'Have you heard that two new planets are discovered?'

14. *Jesi li čuo da je nedavno otkrivena Babilonska kula?*

    'Have you heard that the Tower of Babel was discovered recently?'

15. *Jesi li čuo da se u Meksiku pojavio leteći tanjir?*

    'Have you heard that a flying saucer appeared in Mexico?'

16. *Jesi li čuo da se čudovište iz Lok Nesa pojavilo pred turistima?*

    'Have you heard that the Monster of Loch Ness appeared in front of tourists?

17. *Jesi li čuo da su se rodile petorke u jednoj bolnici u Londonu?*

    'Have you heard that quintuplets were born in a hospital in London?'

18. *Jesi li čuo da je princeza Maxima rodila drugu ćerku?*

    'Have you heard that princess Maxima gave birth to her second daughter?

19. *Jesi li čuo da je mnogo letova otkazano zbog štrajka?*

    'Have you heard that many flights were cancelled because of a strike?'

20. *Jesi li čuo da su svi letovi iz Rima otkazani?*

    'Have you heard that all flights from Rome are cancelled?

21. *Jesi li čuo da je u Sibiru palo nekoliko asteroida?*

    'Have you heard that some asteroids fell in Siberia?'

22. *Jesi li čuo da je Voyager pao u Atlanski okean?*
'Have you heard that the Voyager fell into the Atlantic ocean?'

23. *Jesi li čuo da se na Amsterdamskom aerodromu srušio jedan avion?*
'Have you heard that an airplane crashed on the airport of Amsterdam?'

24. *Jesi li čuo da se Konkord srušio na aerodromu u Parizu?*
'Have you heard that the Concorde crashed on an airport in Paris?'

25. *Jesi li čuo da su neki Japanci došli da rade na filološkom fakultetu?*
'Have you heard that some Japanese people came to work at the linguistics faculty?'

26. *Jesi li čuo da je generalni sekretar Ujedinjenih Nacija došao u zvaničnu posjetu?*
'Have you heard that the secretary general of the United Nations came for a state visit?'

27. *Jesi li čuo da je prošle godine više ljudi išlo na odmor nego pretprošle godine?*
'Have you heard that more people went on holiday last year than the year before?'

28. *Jesi li čuo da je George Bush išao u zvaničnu posjetu u Japan?*
'Have you heard that George Bush went on a state visit to Japan?'

Appendix D: Questionnaire LTRN and STRN (Croatian Version)

UPITNIK:

Izjavljujem da dobrovoljno učestvujem u ovom istraživanju:

Potpis: _____

Ime i prezime:_____

Datum: _____

I. OSOBNI PODACI (bit će korišteni samo u ovoj studiji)

Prezime: _____

Ime: _____

Broj telefona: _____

E-mail adresa: _____

Spol: Ženski □ Muški □

Datum i godina rođenja:_____

Mjesto rođenja : _____Država:_____

Zanimanje:_____

Obrazovanje:

Srednja škola:_____Viša škola:_____ Sveučilište c:_____

II. KORIŠTENJE MATERINJEG JEZIKA

Materinji jezik: _____

Na kom jeziku ste pohađali :

a. Osnovnu školu: _____
b. Gimnaziju/Srednju školu:_____
c. Sveučilište:_____

Da li redovito govorite, čitate i pišete na materinjem jeziku?: _____

Koliko često upotrebljavate maternji jezik?: _____

Gdje i kada upotrebljavate materinji jezik:

Kod kuće: _____ Na poslu: _____ U socijalnim kontaktima: _____

Na kom jeziku komunicirate s partnerom/djecom?: _____

III. KORIŠTENJE DRUGIH JEZIKA

Životna dob (u godinama) i mjesto gdje ste se prvi put susreli s nizozemskim jezikom:

_____

Koliko godina ste imali kada ste se preselili u Nizozemsku?_____

Koliko dugo ste živjeli/ živite u Nizozemskoj? _____

IV. ZNANJE STRANOG JEZIKA:

Da li ste ikada polagali standardni test nizozemskog jezika (e.g. Staatsexamen NT2)? Ako jeste, kada i s kojim rezulatom:

_____

Kako bi ste ocjenili vaše znanje nizozemskog jezika u slijedećim kategorijama?

	Početnički	Osrednji	Napredni	Kao maternji
Čitanje				
Pisanje				
Govor				
Razumijevanje onog što čujete				
Opće vladanje jezikom				

Da li govorite druge jezike? U koliko da, molim vas navedite ih i također na kom nivou u sledećim kategorijama

Jezik (1): _____

	Početnički	Osrednji	Napredni	Kao maternji
Čitanje				
Pisanje				
Govor				
Razumevanje onog što čujete				
Opće vladanje jezikom				

Jezik (2): _____

	Početnički	Osrednji	Napredni	Kao maternji
Čitanje				
Pisanje				
Govor				
Razumevanje onog što čujete				
Opće vladanje jezikom				

English translation:

QUESTIONNAIRE:

I agree to participate in this study:

Signature: _____

Name:_____

Date: _____

I. PERSONAL INFORMATION (Will Remain Confidential)

Surname: _____

Name: _____

Telephone No.: _____

E-mail adress: _____

Sex: Female: □ Male:□

Date of Birth:_____

Place of Birth : _____Country:_____

Occupation:_____

Highest level of Education:

Secondary School:_____College:_____ University:_____

II. LINGUISTIC INFORMATION

Mother Tongue: _____

Language of Education

a) Primary School: _____
b) Secondary School/High School: _____
c) University:_____

Do you speak, read or write in your mother tongue regularly?:_____

How often do you use your mother tongue?: _____

When and where do you use your mother tongue?:

At Home: _____ At Work: _____ In Social Contacts: _____

In what language do you communicate with your partner/children?_____

III. SECOND LANGUAGE(S):

Age and Place of First Exposure to English:

_____

How old were you when you moved to the Netherlands?_____

How long have you lived/have you been living in the Netherlands? _____

IV. SECOND LANGUAGE PROFICIENCY:

Have you ever taken any standardized Dutch proficiency test (e.g. Staatsexamen NT2)? If so, when, where and with what result?

_____

How would you rate your linguistic ability in Dutch in the following areas?

	Beginner	Intermediate	Advanced	Near-Native
Reading				
Writing				
Speaking				
Listening				
Overall Competence				

Do you speak any other languages? If so, please list them here and estimate your general level of proficiency in the following areas:

Language (1): _____

	Beginner	Intermediate	Advanced	Near-Native
Reading				
Writing				
Speaking				
Listening				
Overall Competence				

Language(2): _____

	Beginner	Intermediate	Advanced	Near-Native
Reading				
Writing				
Speaking				
Listening				
Overall Competence				

Appendix E: Questionnaire Control group (Bosnian version)

Izjavljujem da dobrovoljno učestvujem u ovom istraživanju:

Potpis: _____

Ime i prezime:_____

Datum: _____

I. LIČNI PODACI (biće korišteni samo u ovoj studiji)

Prezime: _____

Ime: _____

Broj telefona: _____

E-mail adresa: _____

Spol: Ženski □ **Muški** □

Datum i godina rođenja:_____

Mesto rođenja : _____**Zemlja:**_____

Zanimanje:_____

Obrazovanje:

Srednja škola:_____Viša škola:_____Univerzitet:_____

Da li ste ikada živeli u inostranstvo? Ako da, gdje, koliko dugo, i u koje životno doba? _____

II. **ZNANJE STRANOG JEZIKA:**

Da li govorite druge jezike? Ukoliko da, molim vas navedite ih i takođe na kom nivou prema sljedećim kategorijama

Jezik (1): _____

	Početnički	**Srednji**	**Napredni**	**Kao maternji**
Čitanje				
Pisanje				
Govor				
Razumijevanje onog što čujete				
Opšte vladanje jezikom				

Jezik (2): _____

	Početnički	**Srednji**	**Napredni**	**Kao maternji**
Čitanje				
Pisanje				
Govor				
Razumijevanje onog što čujete				
Opšte vladanje jezikom				

English Translation:

I agree to participate in this study:

Signature: _____

Name:_____

Date: _____

I. PERSONAL INFORMATION (Will Remain Confidential)

Surname: _____

Name: _____

Telephone No.: _____

E-mail adress: _____

Sex: Female: □ Male:□

Date of Birth:_____

Place of Birth : _____Country:_____

Occupation:_____

Highest level of Education:

Secondary School:_____College:_____ University:_____

Have you ever lived in another country? If so, where, for how long and at what age?:

_____

II. SECOND LANGUAGES:

Do you speak any other languages? If so, please list them here and estimate your general level of proficiency in the following areas:

Language (1): _____

	Beginner	Intermediate	Advanced	Near-Native
Reading				
Writing				
Speaking				
Listening				
Overall Competence				

Language(2): _____

	Beginner	Intermediate	Advanced	Near-Native
Reading				
Writing				
Speaking				
Listening				
Overall Competence				

Appendix F: Instructions Picture Verification Task (Serbian Version)

Instrukcije

Na početku ovog eksperimenta pojaviće se jedna rečenica na ekranu. Kad pročitate rečenicu, pritisnite zeleno dugme na tastaturi i tri slike će se pojaviti na ekranu. Svaka slika je označena brojem. Vaš zadatak je da odlučite koja slika pokazuje šta se tačno dešava u rečenici i da pritisnete broj slike koja odgovara toj rečenici. U nekim primerima samo jedna od ponuđenih slika odgovara značenju date rečenice, ali takođe je moguće da i više slika može ići uz datu rečenicu. Ako mislite da se više nego jedna slika slaže sa rečenicom, ukucajte sve brojeve od tih slika kao rečenje datog primera. nakon unošenja broja/brojeva ponovo pritisnite zeleno dugme da nastavite sa sledećim zadatkom. Pokušajte da ne koristite previše vremena za svaku rečenicu jer nas interesuje vaša spontana reakcija. Pre nego što eksperiment počne prvo ćete moći da uradite dve rečenice za vežbu. Posle toga eksperiment počinje.

English Translation:

Instructions

During this part of the experiment you will see isolated sentences on the screen. Once you have read a sentence, press the green button at the front of the keyboard, and three pictures will appear on the screen. Each picture will be identified by a number below it. Your task will consist in indicating which of the pictures represent exactly the content of the sentence by typing in the number corresponding to it. In some cases only one picture matches the meaning of the sentence, in other cases there can be more than one.

If you think that more than one picture match exactly the meaning of the sentence, type in the numbers corresponding to the pictures one after the other. When you have finished with one sentence, again, press the green button to proceed with the next sentence. Try not to spend too much time on each sentence: what we are interested in is your spontaneous impression.

Before the beginning of the experiment you will see two practice items; after those, the real experiment will begin.

Appendix G: Instructions Headlines Task (Croatian version)

Instrukcije

Zamislite da razgovarate telefonom sa poznanikom. Na ekranu će se pojaviti slika iz novina zajedno sa nekoliko riječi koje opisuju šta se dešava na slici. Vaš zadatak je ispričati vijest koju slika i riječi opisuju, koristeći se svim ponuđenim riječima u datoj formi. Svaku rečenicu treba početi sa "Jesi li čuo da..." Sve rečenice će biti snimljene.
Kada ste gotovi sa jednim zadatkom, pritisnite zelenu tipku da nastavite dalje. Prije nego što eksperiment počne prvo ćete moći uraditi dvije rečenice za vježbu. Posle toga eksperiment počinje.

English Translation:

Instructions

Imagine you are on the phone talking to a friend. In front of you, there is a photograph that appeared on a newspaper with some words describing it. Your task is to report to your friend the piece of news illustrated by the photograph using the words, provided in the form they are presented. You will start your sentence with the words: "Have you heard that...?"
All the uttered sentences will be recorded. When you are done with a sentence, press the green button in front of you, at the front of the keyboard, to go on to the following one.
Before the beginning of the experiment you will see two practice items, after those the test will start.